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Global Technical Communication and Content Management: A Study of Multilingual Quality

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GLOBAL TECHNICAL COMMUNICATION AND CONTENT MANAGEMENT: A STUDY OF MULTILINGUAL QUALITY

by

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ABSTRACT

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The field of technical communication (TC) is facing a dilemma. Content management (CM) strategies and technologies that completely reshape writing and translation practices are adopted in an increasing number of TC work groups. One driving factor in CM adoption is the promise of improving quality of multilingual technical texts, all the while reducing time/cost of technical translation and localization. Yet, CM relies on automation and privileges consistency—an approach that is problematic in global TC with its focus on adapting texts based on the characteristics of end-users.

To better understand the interdisciplinary dilemma of multilingual quality in CM, during my dissertation project I conducted a twelve-month long qualitative case study of multilingual quality at a leading manufacturer of medical equipment who had adopted CM strategies and technologies to create technical texts in several languages three years before my study began. In my study, I drew upon an interdisciplinary theoretical base (genre ecology framework, activity theory, actor-network theory, and Skopos theory) to examine the construction of multilingual quality understandings and approaches by

global TC stakeholders who are employees and contractors of the company and the role of CM in their practices.

Examination of the extensive data I collected through observations, interviews, questionnaires, document collection/content analysis, and software exploration uncovered the staggering disconnects in understandings of and approaches to multilingual quality. These disconnects resulted from the lack communication between stakeholders and were promoted by the different relations to CM technology and the mediating work of the new genre, chunks of content. Inhibited knowledge sharing, risk of expertise invisibility and loss, and constrained new ideas about improving multilingual quality were some of the rhetorical, social, and political implications of these disconnects.

As a result of my analysis, I sketched strategies for achieving contextualized multiple-stakeholder approaches to multilingual quality and outlined leadership possibilities for technical communicators in global information development. This analysis provides TC practitioners with strategies for improving multilingual quality in CM contexts; TC educators with ideas for expanding teaching approaches by combining digital and cross-cultural literacies; and TC researchers with opportunities for rhetorical action through critiquing, theorizing, and innovating CM.

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INTRODUCTION

The field of technical communication (TC) is facing a disciplinary dilemma: Content management (CM) strategies and technologies are rapidly adopted in an increasing number of TC work groups, a change that some TC scholars have scrutinized due to the rhetorical, political, and social implications of CM. At the same time, one of the driving factors in CM adoption— translation and localization—is largely disregarded in scholarly TC work, with very few exceptions. A major advertising pitch for CM technologies is the promise of improving multilingual quality, all the while reducing time and cost of translation and localization in multilingual TC projects. Scholars in TC often do not comment on the promise of improving multilingual quality but rather mention CM's affordances for adapting text for specific audiences, including audiences with various cultural and linguistic backgrounds. TC practitioners and specialists who translate and localize technical texts are not as silent about CM strategies and technologies as an avenue for improving multilingual quality and making translation and localization processes easier and more efficient. Multiple blogs, forums, and listservs focus on an array of problems that accompany multilingual CM and provide evidence of practical struggles in making CM work in global and cross-cultural contexts. The best practices offered in practitioner TC discourse solve isolated problems and, due to the nature of the best practices approach, do not include high levels of theorizing; it is difficult to see in those solutions evidence of comprehensive and valued changes to workplaces and multilingual quality.

To address this disciplinary dilemma in TC, in this dissertation project I studied multilingual quality and CM in a company that had adopted CM strategy and technology to create technical texts in English, Spanish for Mexico and Latin America, and Simplified Chinese three years before my study. The TC work group within the company and the translation and localization specialists who work as contractors represent a typical set up for creating multilingual technical texts; in this particular organization these two work groups were also assisted in creating multilingual technical texts by bilingual reviewers with various backgrounds and roles dispersed throughout the company. By examining multilingual quality work processes, perceptions of CM strategies and technology by all participants, and their understanding of the quality of texts and one another's roles, this project strives to find ways of introducing the discussion of multilingual quality into the CM discourse as a way of improving multilingual CM practices, enriching teaching practices in TC, and showcasing the importance of academia-industry collaboration and the roles of academics as researchers-consultants within workplace contexts. To achieve these goals, I use a theoretical framework for studying quality in technological multilingual workplace contexts that includes perspectives from actor-network and activity theories, a genre ecologies framework, and Skopos theory from translation studies.

The combination of these theoretical lenses has very significant implications for research, teaching, and practice in TC.

1. *Expanding academic discourse on CM*

   The combination of the theories I use in my study advances research on CM by incorporating translation and localization (one of the top driving factors for CM

adoption) into the discourse on rhetorical, social, and political implications of CM in monolingual contexts. It does so by linking Skopos theory from translation studies with TC theories that study writing as a phenomenon co-mediated by people, technology, and genres. As a result, my study questions the axiom "CM is good for translation/localization" and sheds light on the contradictions that CM brings to global TC and multilingual quality.

2. *Reconsidering understandings of multilingual quality*

The combination of theoretical lenses helps me advocate researcher-practitioner collaboration in creating strategies for developing contextualized definitions of quality (cf. Spilka, 2000) in multilingual CM. It also allows me to showcase the perils of narrow definitions of multilingual quality imposed by organizational limitations and provide strategies for promoting and creating contextualized multiple-stakeholder definitions of multilingual quality.

3. *Promoting the value of TC specialists in the workplaces*

Through this combination of theoretical lenses, in my study I identify specific ways to move technical communicators from production-centered to knowledge-centered roles by uncovering exigencies for participating in multilingual quality assurance in CM and providing strategies for becoming global information development leaders.

4. *Challenging TC pedagogy*

Today, many TC programs have or are developing classes that introduce students to the foundations and concepts of CM, such as XML, single sourcing (SS), and topic-based authoring. I argue, however, that educators should not introduce CM

> separately from a conversation about global and cross-cultural TC and translation and localization, since these areas are usually interconnected in practice and the rhetoric of CM becomes one-sided without such a conversation. By converging digital and global literacies in teaching, TC educators can better prepare a new generation of technical communicators to handle the challenges of the workplaces and to take leadership roles in information development.

To situate my study within the TC and technical translation discourse on quality and CM, in Chapter 1 of this dissertation I provide a literature review that explains the foundation of my project. In Chapter 1 I examine the definitions of multilingual quality in TC and argue for extending these definitions to include perspectives from technical translation and to consider the impact of CM strategies and technologies. I then introduce the key concepts of technical translation and explain how the positioning of the field influences approaches to multilingual quality. By problematizing CM strategies and technologies, I describe the contradictions that characterize understandings of multilingual quality in the CM discourse and show the need for TC researchers to take a more active part in conceptualizing multilingual quality in CM contexts. At the end of the chapter I present my research questions.

In Chapter 2 I describe and defend decisions relating to my case study design and methodology. I depict the research setting of my dissertation study and present my methodological approaches for studying multilingual quality and CM in workplace contexts. While clarifying how I addressed the criteria for judging the quality of research design, I discuss my methods for collecting and coding data and explain the theoretical framework (a combination of activity theory, actor-network theory, genre ecology

framework, and Skopos theory) that I used for this dissertation project to systematically examine multilingual quality in global TC workplaces that are reshaped by CM technology and emerging new text genres. I conclude this chapter by reflecting on my strategies for ensuring ethical research design and reporting and elucidate on how and why I adapted my approaches when working with participants from linguistic and cultural backgrounds different from my own.

Chapter 3 reports the findings of my case study and presents an in-depth analysis of multilingual quality and CM informed by the theoretical framework I introduce in Chapter 2. In particular, this chapter explains how CM introduces a new genre into global TC and how this new genre—chunks of content—impacts the genre ecologies of multilingual quality stakeholders; how the tensions in global TC activities are connected with the contradictory understandings of and approaches to multilingual quality; and how technical communicators can take leadership opportunities in multilingual quality management by creating alliances with other multilingual quality stakeholders and CM technology. A part of this chapter also focuses on the strategies for contextualized multiple-stakeholder multilingual quality that (as a researcher of a workplace context) I designed for the research site. While these strategies are connected to a particular context, one of their goals is to exemplify fruitful academia-industry collaboration. These strategies and the descriptions of how multilingual quality stakeholders made their competencies (in-)visible showcase opportunities for technical communicators to move from production-centered to information-centered roles and take leadership positions as global technical information developers within organizations.

In Chapter 4 I summarize the conclusions I drew from my study and attempt to elucidate some of its implications for TC practice, pedagogy, and research. I outline opportunities for TC practitioners to manage multilingual quality within their organizations and sketch the critical skills and competencies that graduates from TC programs need to possess such as, for example, negotiation and leadership skills. I then focus on the implications of my study in TC research, which include its contributions to understanding CM as a rhetorical, social, and political component of multilingual TC; its illustration of the importance of contextualized multiple-stakeholder definitions of quality in multilingual CM in workplace contexts; its capability to situate multilingual quality as an opportunity for technical communicators to become knowledge workers; and its conception of a theoretical framework for analyzing multilingual quality and CM that includes voices from both TC and technical translation.

CHAPTER 1: CHALLENGES AND OPPORTUNITIES OF CONTENT MANAGEMENT FOR MULTILINGUAL QUALITY

"*If I'm selling to you, I speak your language. If I'm buying, dann müssen Sie Deutsch sprechen! [then you must speak German]"*

Willy Brandt, Nobel Peace Prize winner and former German Chancellor

…there are some standards that work very well for translation buyers but are certainly against our [translators'] interests. In my opinion, one of those standards is DITA, an XML-based standard that provides the ability to segment the source text into small chunks that can be used in a variety of ways and allow for a great reuse of data; however, this works much to the detriment of the translator who often lacks the necessary context. (…) it's one of those prime examples where we failed to participate in the development.

Translation blog posting (2011)

Since 2000 one of the most repeated calls for research in technical communication (TC) challenged scholars to create academia-industry alliances to showcase their skills and better contribute to the development of best practices in the field (e.g., Andersen, 2011; Blakeslee, 2001; Bridgeford, 2004; Spilka, 2000; Tovey, 2001). The reason behind these calls for research is the divide between academia and industry that has been a topic of discussion in TC for many years (e.g., Carliner, 1997; Hayhoe, 1998). This divide can be a major hindrance to the development of our field (Council for Programs in Technical and Scientific Communication [CPTSC] conference, 2012).

Spilka (2000) identified research on quality as one of the opportunities to bridge the academia-industry divide. She challenged TC scholars to "educate technical communicators and upper management about contextually-appropriate heuristics for quality definition and measurement, and the benefits of promoting technical communicators to the strategic role of the 'gatekeepers of quality' in organizations" (p.

209). Today, as the audiences of TC work become increasingly global and TC practice becomes increasingly mediated by new technologies, it is critical for TC scholars to guide the efforts in reconsidering the understandings of and approaches to quality. TC researchers need to question accepted practices in cross-cultural TC and overcome the English-centric model (c.f. Hayhoe, 2006; Kim at el., 2008; St.Amant & Rife, 2010; St.Germaine-Madison, 2006). They also need to focus on the rhetoric of single sourcing and content management (CM) to allow technical communicators to position themselves better within their workplaces (e.g., Carter, 2003; Giammona, 2004; Jones, 2005; McDaniel, 2008; Sapienza, 2004; Wick, 2000). One critical direction of this necessary research is the interconnection of single sourcing, localization, and standards-driven content development (e.g., Hart-Davidson et al., 2007).

The discourse on multilingual quality and CM is interdisciplinary: it combines the intermingling interests and challenges of the TC and technical translation communities. Technical translators often struggle to develop new translation strategies that would accommodate the changes in translation processes brought by CM. At the same time, on multiple occasions technical communicators counter the complaints of the technical translation community with statements that good writing in English makes CM-defined translation easy and that guidelines for CM-defined translation created by CM professional organizations (e.g., the DITA OASIS Translation Subcommittee) or leading CM consultants (e.g., Hackos, 2006; Rockley & Cooper, 2012) address any problems technical translators might encounter. Another counter-argument that I overheard at a TC conference is that technical translators had to deal with technologies that impose

inconvenient rules on translation processes long before CM (reading between the lines: why all the fuss now?).

In this interdisciplinary academia-industry context, it is critical for scholars in TC to start participating in the discussion of how CM methods and technologies impact multilingual quality. This participation will not only allow us to safeguard the importance of rhetoric and culture when working with information development and writing technologies, it will also help us position technical communicators as leaders in global information development and enrich our pedagogy for educating a new generation of global technical communicators. To participate in this discourse successfully (and to ensure that multilingual quality is not just a selling point and is not understood too narrowly), we need to complicate the approaches to multilingual quality in TC; gain a better understanding of technical translation complexities, especially as they relate to multilingual quality; and problematize CM discourse to unpack and complicate the all-too-common assumption that CM methods and technologies will improve the quality of translated texts.

MULTILINGUAL QUALITY IN TECHNICAL COMMUNICATION

Many technical communicators agree that the quality of the information about the product influences users' perceptions of this product (e.g., Mead, 1998; Wilde, Corbin, Jenkins, & Rouiller, 2006) and that document quality is an important means of showing the added value of the profession (Carliner, 1997; Ramey & Redish, 1995; Redish, 2003). Quality in TC is still, however, a very fuzzy concept. While describing the academia-industry differences (also c.f. Carliner, 1997; Smart, Seawright, & DeTienne, 1995) that

characterize the interest in and understanding of quality, Spilka (2000) noted that the "one constancy about the quality issue is that no two authors seem to agree on what is meant by the quality of workplace writing" (p. 209) and that "a circle of ambiguity" surrounds quality and its definition (also c.f. Schriver, 1993). Quality definitions in TC include many elements (Smith, 1996):

- conforming to predetermined design specifications (design-based definitions)
- achieving measurable product attributes (product-based definitions)
- satisfying customer needs and expectations (customer-based definitions)
- achieving customer satisfaction through product excellence at an acceptable price (value-based definitions)
- differentiating products to provide a competitive advantage (strategic quality definitions)

Several authors attempted to design a map of quality definitions that would help to avoid relying exclusively on one definition (e.g., Smart et al., 1995; Schriver, 1989) or suggested that quality is a contextualized concept and we should customize definitions for particular work sites by taking into account what each context values most (e.g., Smart et al., 1995; Spilka, 2000).

Since quality is subjective and relative (e.g., high quality to developer, but poor quality to reader, Hackos, 1994), Spilka (2000) affirms that relying on just one definition of quality in TC is impossible and undesirable; she advocates promoting academia-industry alliances as a way of broadening and customizing (contextualizing) quality definitions. In

creating a holistic, sensitive model of quality we should, according to Spilka, be user advocates, but also remember that workplace writing has many influences and constraints, such as "the needs, preferences, and orientations imposed by the client or supervisor, internal reviewers, the writing or project team, their own organization, and partner organizations" (p. 212).

The variations of quality definitions in TC are reflected in multiple strategies for achieving and measuring it (see Table 1).

Quality is achieved …	**Quality is measured …**
through standards, inspection for technical quality (formal validation procedures, technical review, QA) and communication quality (editing, senior reviews, etc.), peer reviews, usability testing, field studies, contextual inquiry, etc. (Ramey, 1995)	quantitatively (e.g., counting number of support calls, the number of errors in a new draft, and the number of errors that users make while following instructions) and qualitatively (e.g., usability testing) (Spilka, 2000)
via structured work processes (Ramey, 1995) or collaborative and structured approaches (Weiss, 2002)	through ease of use, findabiliy, and ease of understanding (Hargis et al., 2004)
through professional communicators themselves (Reilly, 1993)	through the levels of evaluation model: user satisfaction, user performance, client performance, and client satisfaction (Carliner, 1997)
	by cost avoidance and customer satisfaction (Redish, 1995)
	through text-focused, expert-judgment-focused, and reader-focused approaches (Schriver, 1989)
	through quality dimensions: essential, conventional, attractive quality (Smart, 2002)

Table 1: Achieving and Measuring Quality in Technical Communication

Raven (1995) and Spilka (2002), however, caution technical communicators not to rely on a single quality measure as it might be detrimental to the quality of documentation.

Rather, technical communicators should think of the fluid nature of quality (Smart, 2002), since some dimensions that are important in assessing one document may be less important or irrelevant with other documents; the importance of individual dimensions of quality changes depending upon the audience, context, and purpose of the document.

While quality definitions and strategies for achieving and measuring it are very diverse and account for multiple angles of TC practice, *multilingual* quality has received comparatively little attention. The understanding of multilingual quality is often connected with a rather dubious understanding of technical translators' approaches to creating good translations. For instance, Hallman (1990) noted that "a technical translator's only recourse (…) is to provide a faithful rendering of the text" (p. 245); even if the translation is bad but it stays true to the source text, a translator's work is accomplished. Eubanks (1998) stressed that while translators do make composing decisions, they are "primarily concerned with fidelity to a source text" (p. 52). Some TC authors try to depart from this understanding of multilingual quality through the lens of a source text. Maylath (2001) adds the usability variable to describe translation quality; however, Maylath still uses the term "accurate" in this context (while "accurate" means free from error, it also has the connotation of "conforming"). Weiss (1995) cites Sándor and Higgins to note that technical translation is pragmatic, practical, and purposive, and, thus, target-oriented. He further references Delisle to emphasize that a target text and a source text should not necessarily be equivalent in any linguistic sense. In fact, evidence from a court case from Switzerland suggests that a good technical translation should first and foremost fulfill the purpose and function prescribed to it, regardless of the original source text (Hammond, 1995).

The lack of clarity in understanding the purpose of technical translation and the emphasis on the accuracy and connection to the source text result in often rather formalistic approaches for achieving and measuring multilingual quality in global TC. These approaches only recently started to incorporate perspectives on culture (see Table 2).

Quality of translated technical documents is achieved …	**Quality of translated technical documents is measured…**
through including translation/localization early on (Hackos, 1994; Hoft, 1995; Spalink, 2000; Ulijn, 1996)	by legal accuracy and minimum problems (Hackos, 1994)
through technical accuracy, correct language, avoiding cultural bias, mechanics, formatting, conforming to legal requirements, localization (Hoft, 1995)	through consistent, appropriate formatting, measurement conversion, looking for missing text (anecdotal evidence)
by hiring a qualified translation agency, setting requirements, schedule, and glossary of terms, avoiding Americanisms, reviewing legally sensitive information (Hackos, 1994)	through a combination of expert analysis and reader-focused evaluation in which multilingual teams with expertise in the target languages, linguistics, and usability focus on correctness and functional errors (Hulst & Lentz, 2001)
with the help of cultural consultants (Artemeva, 1998)	through a combination of checklists, tests, feedback, process checkpoints, internal standards, and conventions (Hoft, 1995)
by cultural usability testing (Barber & Badre, 1998; Choi et al., 2005), which "incorporates cultural factors from both the immediate context and sociocultural context into the object of inquiry and situates culture in the dynamic interactions of the instrumental and social affordances of the technological artifact" (Sun, 2006, p.464)	

Table 2: Achieving and Measuring Multilingual Quality in Global Technical Communication

Unfortunately, these approaches for achieving and measuring multilingual quality do not reflect sufficiently the perspectives of the technical translators who transform technical texts from English into the languages of the global audiences. In addition, they do not

account for the shifts in TC paradigms brought by the new approaches to TC and technologies for enabling these approaches: content management, single sourcing, and content management systems. To continue being user advocates while taking into account workplace constraints, I argue, TC researchers need to include the complexities of technical translation and the impacts of content management strategies and technologies into discussions on multilingual quality.

MULTILINGUAL QUALITY IN TECHNICAL TRANSLATION

Technical translation is a rather new field of study that stems from translation studies. While translation studies and technical translation clearly share their subject—transferring meaning from one language to another—the major concerns of technical translation are often ignored in the larger field, translation studies. One such concern is multilingual quality: there is no agreement among translation scholars on how to measure the quality of a translation and if we can even call a translation good, adequate, or appropriate (e.g., Brunette, 2000; Kupsch-Losereit, 1985; Lauscher, 2000; Reiß, 1989).

When quality in technical translation is viewed from the point of view of translation studies, then, Byrne (2007a) argues, quality evaluation is usually devoid of reference to professional practice. For example, theories from translation studies do not account for such "practical" but frequent errors as omissions, incorrect comprehension, errors related to register, syntax, grammar, style, etc. Pym (1992) notes that translation errors "may be attributed to numerous causes (lack of comprehension, inappropriateness to readership, misuse of time) and located on numerous levels (language, pragmatics, culture)" and that

"the terms often employed to describe such errors (overtranslation, under-translation, discursive or semantic inadequacy, etc.) lack commonly agreed distinctions or fixed points of reference" (pp. 281-282).

Several approaches in translation studies can be applied to the discussion of translation quality; they concentrate on the equivalence of target text to source text and the purpose of both texts (adapted from Byrne, 2010).

- *Approaches based on equivalence*. These approaches consider a translation good when it is as close as possible to the source text. Consequently, these approaches emphasize that a reader should always see that a text is a translation (e.g., there should be a degree of "foreignness" in the translation), so they place more emphasis on the text rather than the readers. For technical translation, this is a problematic idea since its goal is to deliver information in the form that would make it easy and fast for the reader from a particular linguistic and cultural background to find and understand.
- *Approaches based on functionalism theory*. These approaches focus on functions of the target text and pragmatic and situational aspects of translation. While they consider the importance of both source text and target text and thus help to think about adapting texts to the needs of the audience, they fail to account for situations where the function of the target text differs from the function of the source text (e.g., due to cultural variables).
- *Approaches based on relevance*. These approaches manage to take needs/expectations of the audience into account and acknowledge that "people do not want to spend more time and effort than is absolutely necessary in order to

retrieve information from a text" (Byrne, 2010, p. 38). For translation of technical texts, however, these approaches are problematic, because they disregard such distinctions as good or bad translation (Hönig, 2008) and claim that a real translation cannot survive on its own without the source text.

- *Approaches based on the Skopos theory*. These approaches are determined by the intended purpose and perspective function of the target text (cf. Reiß & Vermeer, 1984). They recognize that functions of target text and source text may differ. Skopos approaches take the audience into account and provide language for discussing adapting translations based on the characteristics of these audiences. They also connect the quality of translation with translation rules for each individual translation project that should be set out before it can begin, thus, emphasizing the value of collaboration in translation quality. When functions of texts are different in different cultures (even when the purpose is the same), technical communicators often cannot make a good judgment of Skopos and *need* to collaborate with technical translators to determine the specifics of a translation project.

These four approaches are reflected in a rather large number of translation strategies leaving professional translators "to make decisions which can be regarded as, at best, reasoned but ad hoc or, at worst, subjective" (Byrne, 2010, p. 45); however, as I argue in Chapter 2, Skopos theories provide most valuable insights into the practices of *technical* translation. This discourse of theoretical problems with evaluating translation quality is absent from TC literature—a regrettable situation that promotes practices in which

technical communicators can only tend to their own immediate quality evaluation problems without an overview of the larger picture of global TC.

The evolving field of technical translation has developed some procedures to address the fuzzy concept of multilingual quality on a more practical basis. There is a push for translation agencies that work with technical translations to become EN 15038-certified (EN 15038 is a bench-mark standard for translation services published by the European Committee for Standardization in 2006). While EN 15038 specifies translation, checking, revision, review, proofreading, and final verification in the translation process, a quality translation service must include a minimum of translation (a qualified translator translates the document and then checks the work once the initial translation is completed) and review (a person other than the translator examines a translation for its "suitability for the agreed purpose, and respect for the conventions of the domain to which it belongs" and recommends "corrective measures"). This approach requires, of course, hiring qualified specialists for all stages of quality assurance (QA). While the American Translators' Association (ATA) offers a rigorous certification process, certification does not provide a 100 % guarantee that every certified translator will do an outstanding job every time. At the same time, translator education is not a guarantee for translation quality either, since many translation programs train in translation studies and literary translation.

As a result, technical communicators (clients in technical translation projects) are left with the hope that their translation providers (translation agencies) have rigorous QA procedures. Translation agencies that usually work as a middle man between technical communicators and technical translators develop such procedures for QA. These procedures consist of working on a document in three stages: first, a translator (or a group

of translators) creates the document in a foreign language; then a proofreader reviews the target text while comparing it to the source text to eliminate any errors of style, grammar, word choice, mistranslations, missing text, etc; then a QA specialist reads the target text only to look for objective errors and inconsistencies. Translators, proofreader, and QA specialists are usually picked from a pool of translators because they are native speakers of the target language and have experience in the subject area of the text. In this three-stage QA process, the translators and the proofreaders rely on their own understanding of what makes a good translation, while the QA specialists usually receive a checklist of specific issues to look out for (these checklists differ from company to company).

Striving to outline a more tangible way of evaluating translations, ATA also published a brief Translation Buying Guide in its website, in which the quality of a translation is equated with "the degree to which it follows the agreed-upon specifications" (p. 4). The authors of the guide advise to use translation industry standards (e.g., ASTM, ISO, EN, CEN, DIN) to develop these specifications and point out that the client (technical communicators and their organization) should agree with a translation service provider (translation agency) on a set of specifications.

The quality of technical translations is also defined sometimes through a translator's liability for it, since errors in technical translations can have serious legal implications (cf. Byrne, 2007a). Mayer-Schöneberger (1999) argues that the work of translators is then best evaluated not by the correct outcomes of their work, but rather by translators using their best efforts while translating. To make the evaluation of the translation process less subjective, Ansaldi (1999) suggests concentrating on whether "translation was done in keeping with procedures that would be generally recognized by other members of the

community of translators as proper, necessary, or appropriate for that type of work" (p. 13). He further notes that technical translators are more likely to be viewed as providers of a service (and not as sellers of goods) and thus would most likely be judged according to the standards used for other service providers. In this respect, Ansaldi introduces the concept of "good and workmanlike manner" into technical translation evaluation; he defines it as "quality of work performed by one who has the knowledge, training, or experience necessary for the successful practice of a trade or occupation and performed in a manner generally considered proficient by those capable of judging such work" (p. 13). Byrne (2007a) argues that the concept of "good and workmanlike manner" is "particularly relevant to freelancers who market themselves by promoting their specialist skills and knowledge." In other words, if translators advertise themselves as having" 15 years of experience and a degree in engineering," the expectations for translation quality rise, as does the responsibility of the translator for this quality.

As we can see, the technical translation industry has multiple approaches for evaluating quality. However, the number of approaches, their caveats, and the lack of uniformity point to the troublesome nature of multilingual quality evaluation and show that this concept is evolving. While diligence of translation agencies and technical translators in achieving quality cannot be discounted, a lot of responsibility rests, I argue, on the collaboration strategies among all multilingual quality stakeholders. The rhetoric of collaboration (especially in defining the function of translation and translation specifications) is directly connected to the quality of technical translations. It encourages technical communicators to see that translation is neither something "fully out of control of anyone who does not speak the target language" nor something that "must be

delegated blindly to translators, not to say to any native speaker for editing and proofreading" (Doumont, 2002, p. 46). It also allows complicating the understanding of multilingual audiences and promotes more consideration for the hurdles each multilingual quality stakeholder faces. For technical communicators, becoming leaders of global information development means *taking leadership initiatives* in the multilingual quality collaboration. To do so, they need to combine their knowledge of quality with technical translation theories and practices to understand better the way emerging technologies, such and content management systems, impact the view of quality in multilingual projects, so that they can resist defining quality two narrowly.

However, before we proceed to discussing the impacts on multilingual quality that CM brings, we first need to problematize the field of technical translation and several of its key definitions. This approach

- puts the focus on the rather rocky road of the emergence of technical translation as a rhetorical and creative field;
- helps shed light on how uncritical reliance on CM technology could inhibit the understanding of technical translation as a very creative and rhetorical field; and
- provides initial insights into how the rhetoric of technology that challenges the creative and rhetorical nature of technical translation can have very unfortunate consequences for multilingual quality in TC.

PROBLEMATIZING THE FIELD OF TECHNICAL TRANSLATION AND ITS KEY DEFINITIONS

As the quote at the beginning of this chapter illustrates, TC in global and cross-cultural contexts requires companies to speak the languages of their users. But what does it mean to speak somebody's language in global TC? International businesses have a legal and ethical duty to make their products safe for consumers and need to devote resources to making product information adequate for global users (Lipus, 2006). Some companies attempt to meet these obligations by generating information without any country- or culture-specific references (LISA: Localization Industry Standards Association, 1990-2011) or prefer "wordless manuals" like those produced by Hewlett-Packard (Barnum & Li, 2006). However, many importing countries (e.g., countries of the European Union, Russia) now require product information to be in their official language(s). In global TC, to create product information in foreign languages, one engages in technical translation. To understand what technical translation entails, we first need to differentiate between two terms, translation and localization. Throughout this work I will be using the term translation to describe the process of the interlingual transferring of meaning, and the term localization to describe any attempt by stakeholders to transfer the meaning intralingually—to adjust technical texts to the cultural, rhetorical, educational, ethical, legal etc. characteristics of readers and the global, national, and local contexts in which they interact with texts and products (adopted from Byrne, 2010; Hackos, 1994; Hoft, 1995; Melton, 2008). "Technical translation" then identifies the field whose goal is to help meet the information needs of the global audiences *through translation and/or localization*; the work in this field also exhibits one or more of the characteristics of TC:

- Communicating *about technical or specialized topics*, such as computer applications, medical procedures, or environmental regulations.
- Communicating *by using technology*, such as web pages, help files, or social media sites.
- Providing *instructions about how to do something*, regardless of how technical the task is or even if technology is used to create or distribute that communication.

Society for Technical Communication (STC), *Defining Technical Communication*

However, neither the field of technical translation nor the terms that constitute its definition, translation and localization, are universally understood. The main misconceptions are in the rhetorical nature of technical translation and the distinction between translation and localization; these misconceptions often lead to the view that technical translation can be simplified or even accomplished solely with technology. To negotiate the relation of technical translation and technology, I first examine the contradictory views of technical translation as a mechanical versus a rhetorical discipline. I then explore the role of localization in the rhetoric of technical translation. I conclude this section by explaining what role technology plays in the rhetoric of technical translation.

The Rhetorical and Pragmatic Nature of Technical Translation

The struggles of technical translation as a field with defining its relation to practicality/pragmatism and rhetoric/creativity have interesting similarities to the conversations about pragmatism, humanism, and rhetoric in the works of Miller (1979, 1989) who suggested that we should understand “practical rhetoric as a matter of conduct

rather than of production, as a matter of arguing in a prudent way toward the good of the community rather than of constructing texts" (p. 23). For technical translation, indeed, the pragmatism means that readers have "quite different requirements, as these [technical] documents can directly affect their wellbeing or their ability to use a particular product" (Stejskal, 2006, p. 12). For example, an error in a translation of a novel might discourage the reader or lead the reader to question the skills of the writer and the editor. An error in the translated instructions on how to administer a new medication can lead to serious health complications for a patient. At the same time, the translated instructions on how to administer a new medication are very rhetorical; for example, these translated instructions reflect the issues of power and access to information, self-representation of the producer of pharmaceuticals, and the construction of safety and efficacy narratives.

However, the misconception that technical translation is a non-creative field that transfers arhetorical technical information uniform for all cultures and languages has impacted the positioning and identity of the field. Its original home is in translation studies, where technical translation "has long been regarded as the ugly duckling of translation, especially in academic circles" (Byrne, 2010, p. 1). This is a rather strange situation if one considers that technical translation is a very old field of practice that constitutes 90% of the world's total annual translation output (Kingscott, 2002). The reason for the lack of attention in the translation studies to technical translation is that academic translation studies focus primarily on literary translation, neglecting technical translation because it is classified as non-literary (cf. McKay, 2006; Nida, 1982). This lack of interest is based on the fact that non-literary translations are considered "pragmatic," thus caring for the content of the message more than for its aesthetic form (Casagrande, 1954, cited in

Olohan, 2009). In the "pragmatic" or "commercial" translation category, technical translation is sometimes singled out as a subgroup because it can be defined through the subject domains it relates to; it is also bulked into the "scientific and technical translation" subgroup or combined with translations in sciences, law, medicine, economics, etc. into a group of "specialized" or Language for Special Purposes (LSP) translations (Gouadec, 2007; McKay, 2006; Olohan, 2009; Wright & Wright, 1993).

While these attempts to categorize technical translation do not provide a consistent definition, they generally stamp it as pragmatic, straightforward, and arhetorical work that requires just the knowledge of terminology. This misconception is among the reasons for the absence of technical translation in scholarly publications on translation. Many authors mention technical translation only in relation to the necessity for technical translators to know technical terminology in one or more technical subject areas (Anderman & Rogers, 2003; Sofer, 2006); others do not mention technical translation at all (Munday, 2008) or only include it as a glossary entry (McKay, 2006). An epitome of this view of technical translation as an arhetorical practice is the discussion on whether technical translation can be done through machine translation without any human involvement whatsoever (Hutchins & Somers, 1992; Sager, 1994; Scarpa, 2002; Vinay-Darbelnet, 2008).

Luckily, the view of technical translation as pragmatic and arhetorical is changing. Some technical translation and TC authors note that translation calls into question the singularity of meaning (absence of ambiguity) through the context of information—a concept "central to pragmatic enquiry and to the study of translation" (Baker, 2006, p. 317)—that is structured through the interpretation of reality (Benjamin, 1989, cited in

Weiss, 1997). Translation is a complex cognitive process (Shreve & Koby 1997, cited in Flint et al, 1999) rather than "a straightforward, convergent, sentence-level process" (Doumont, 2002, p. 46). Even more importantly, technical translation is so complex that it cannot be "entrusted to any native speaker or be arbitrarily fragmented or iterated" or "carried out satisfactorily by software applications" (Doumont, 2002, p. 46). Byrne (2009) also argues that technical translation "involves some form of intellectual addition to or processing of the information in the source text, whether by adding, removing, clarifying, interpreting, rephrasing, recontextualising or recasting information for the target audience." For instance, the instructions on how to administer a new medication need to take into account the specifics of health care in a given country: who (a physician or a nurse) is administering the medication, how safe it is to assume that nurses and physicians have the same education backgrounds in different cultures, and how realistic it is to think that the person who administers the medication has the same monitoring equipment in different countries. In other words, the translation needs to take into account the audience of the text and the contexts in which the audience is interacting with the text.

The relation of technical translation to its audience is, perhaps, the main reason that technical translation is becoming closer to TC than to its original home, translation studies (Byrne, 2010). Technical translation is now included into the umbrella definition of technical communication (STC: "Globalization & Localization Specialists"). Scholars interested specifically in technical translation argue that technical translators are writers by definition and many of them turn to technical writing and become "multilingual technical writers" (Gouadec, 2007). These scholars emphasize the need to start looking at

entire document lifecycles, with technical translators working under controlling influences that originate with technical writers and with the audiences, such as job specifications, resources, knowledge level (Schubert, 2009). Byrne (2010) also stresses that due to evolving legal regulations that entitle customers to instructions and manuals in their own languages (e.g., Council of European Union Resolution C411) technical translation becomes an integral part of creating technical documentation.

However, technical translation and TC are far from being integrated. Not only do we usually publish in different venues; we also see our relations as clients (technical communicators) and contractors (technical translators). This separation is evident during TC conferences, where you can always find a "technical translation only" area (e.g., vendor displays, panels). Yet, technical communicators and technical translators often work on the same projects and share a common goal: making information usable and accessible for global readers. To do so, technical communicators need to complicate the notions of usability and accessibility beyond our North American cultural understanding. Next, I explain the problems with defining the nature of localization and argue that technical texts can (and should) be localized.

The Nature of Localization and Its Role in Technical Translation

The widespread belief that technical content can be arhetorical often leads to the misconception that technical texts (as compared to, e.g., literary or marketing texts) do not need to be localized—they convey technical information that is uniform throughout the world. Hoft (1995) argues, however, that no text can be translated without being localized to some degree; e.g., even transferring US measurements to metric

measurements would constitute localization. In addition, many experts agree that localized documents get better user responses (Hackos, 1995) and increase the global consumability of products (Pierce, St.Amant, & Minerley, 2010), as well as that a "localized, cultural knowledge may be necessary in order to achieve an analogous, appropriate rendering of the text's ideas and nuances" (Weiss, 1995, p. 412). I join these experts in advocating the importance of localization of technical texts and argue that technical translation cannot be a rhetorical success without a certain degree of localization. I start this argument by bringing clarity to the often sloppily used term "localization" and then provide examples of previous research that showcase the importance of localizing technical texts.

The idea of localization is not new; Parrish (2003) notes that "artists, traders, marketers and missionaries realized hundreds of years ago that their products and ideas sold better if they were adapted to the expectations, culture, language and needs of the potential customers" (cited in Schäffner, 2009, p. 157). However, there is no agreement in the translation and TC literature on the exact definition of localization. The problem is that localization often is described as linguistic and cultural adaptation of *digital* content, perhaps because digital texts are seen as more readily available to global readers. At the same time, "a set of translative interventions which result in a text that is not generally accepted as a translation but is nevertheless recognized as representing a source text" for *print* texts is referred to as adaptation (Bastin, 2009). The *Routledge Encyclopedia of Translation Studies*, perhaps one of the most extensive sources on translation terminology, notes that popularized in the 17th and 18th century France in the form of the *belles infidels* (novels that were not just translated into French but adapted to please the

tastes of the new readership while maintaining some form of equivalence between original text and the text in a foreign language), *adaptation* received new interest through the proliferation of *technical, scientific, and commercial translation*.

The separation of terms for describing digital and print texts often results in inconsistent definitions of the term localization in TC literature. Sometimes the term localization is used to refer to converting a software product for use in a particular country (Hackos, 2006) and translating "all localizable material in software products, such as user interface strings, icons, error messages and other text" (Cowan, 2008, p. 123). At other times localization is described as "taking information that is technically and culturally specific to the original language and changing it into a form that is correct and meaningful to other countries" and to national and cultural environments (Hackos, 1994, p. 497; 2006). In order to avoid inconsistency and to showcase that possibilities and necessity for adaptation need to be carefully considered for all genres of TC, I will use localization as a broad term that describes both digital and print texts.

Since localization denotes "a procedure which can be used whenever the context referred to in the original text does not exist in the culture of the target text" (Vinay and Darbelnet, 1958, cited in Bastin, 2009), it requires re-evaluating of all aspects of information. While there is little codified knowledge in the theory of localizing technical texts, there are many excellent studies and storylines that showcase the successes and challenges of localization on the intersection of rhetorical, cultural, and organizational concerns. These studies and storylines suggest that culture defines differences in technology use (Sun, 2006), visual and genre expectations (Artemeva, 1998; Thatcher, 2006), information architecture (McCool, 2006), informational needs and persuasion

strategies (Artemeva, 1998; Gattis, 2008; Ulijn, 1996), and the ways people create, read, understand, and respond to texts (Barnum & Li, 2006; Maylath, 1997; Thatcher, 2006; Thrush, 2001; Ulijn, 1996; Ulijn & St. Amant, 2000), etc. For example, Bao (2011) uses an example of high-tech medical equipment to show how a translator needs to make information meaningful for the audience and how far a translator can deviate from the original text. I (2010) examine how health information that relies on privacy practices that are considered legal and ethical for the U.S. audience in clinical trials might be unexpected and even terrifying for a Russian trial participant.

Technical communicators cannot rely solely on translators to re-evaluate all aspects of the information in localizing technical texts. To take the coveted role of global information development leaders, technical communicators need to *lead* global information development. This means that technical communicators need to know how to find localization experts (not every technical translator has the expertise or training to do localization work), how to set localization tasks, and how to ensure quality of localization work, etc. In addition, localization requires more time, because every angle of a text needs to be reconsidered. So, the traditional approach of paying per word of the text for translation is problematic for localization practice. Thus, technical communicators need to understand the rhetorical benefits of localization to justify the time and costs to their companies. Several authors have already started putting the rhetorical benefits of localization into workplace contexts by drawing attention to the value added of localization: when companies make technical texts more culturally appropriate, they can save money by "eliminating the need for increased user support" (McCool, 2006, p. 182) and increase sales and customer satisfaction (Ledet & Bailie, 2005). However, technical

communicators need to be able to put localization as a reflection of multilingual quality into the context of broad quality definitions (c.f. Spilka, 2000), which include, for example, organizational and workplace concerns.

No less important than leading global information development efforts is the fact that TC has always been grounded in the rhetorical tradition (cf. Miller, 1979), which is represented in our commitment to information consumers and product users. The studies and storylines I mention above are an appeal to our core value as a field, an appeal against the English- and US-centric model of TC that can disregard any reader or user whose language is not English and whose culture is not North American or treat them through the US-comparative lens (cf., Longo, 1998; Stohl, 2001; St.Germaine-Madison, 2006; Thatcher, 2010). To continue being user advocates, TC researchers need to be acutely aware that if technical texts are not culturally appropriate, they may "lead to misunderstandings or frustration for the user" (St.Germain-Madison, 2006, p. 191). That is why TC researchers need to keep identifying new knowledge that helps explain the role of localization in technical translation through collaboration with practitioners. TC researchers also need to work on codifying this knowledge to make it more readily available for educators and practitioners. This knowledge is the key for technical communicators to become active participants in defining widely-accepted and newly emerging methods and technologies for global TC.

Rhetoric of Technology in Technical Translation

The view of technical translation as arhetorical work is often reflected in the role that some researchers and practitioners ascribe to technology in it. As I have mentioned

earlier in this chapter, technical translation is one of the few areas of translation where the possibility of machine translation (MT) that excludes any human work has been considered an avenue for saving and increased efficiency for official documents of a company. While experiments with machine translation continue and there are some considerable improvements in the technologies, at their current stage they are incapable of addressing the full range of complexities of technical translation (Doumont, 2002), particularly since there is still "a real gap between machine translation developers and translators" (Jenney, 2011, p. 10).

However, another technical translation technology, Computer-Aided Translation (CAT), can boast of much wider acceptance. A CAT system is a computer application that assists human translators in managing bilingual content by using markup and metadata to divide content of a document from its presentation in order to break the resulting file into component parts ("segments") and compare these segments to segments of previously translated text. Segments of previously translated text are stored in a bilingual database—translation memory (TM). The segmentation is usually very granular, with segments often equaling a sentence or even a phrase. TM allows matching segments in all new documents to the existing database: in such a way, consistent translations are used and translators can save time (and money) since they do not have to re-translate similar text. Once a TM is created (see Figure 1), every new document can be segmented and run through the database to offer technical translators existing translation variants. After a new document is translated, the new content that was previously not in the TM is added to this database. With each new translation the TM grows (see Figure 1).

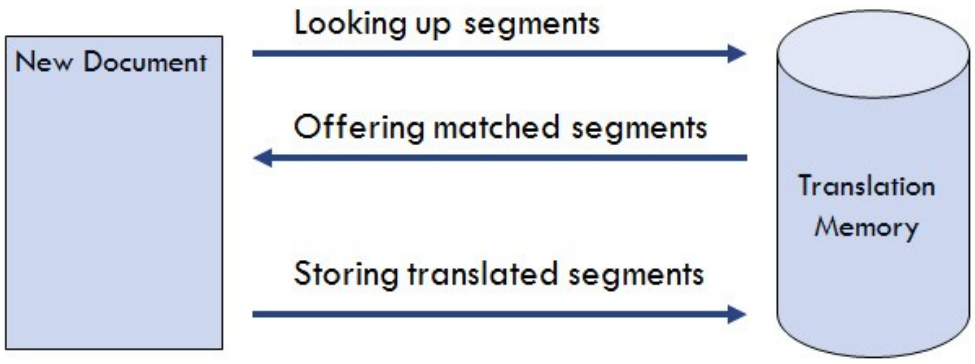


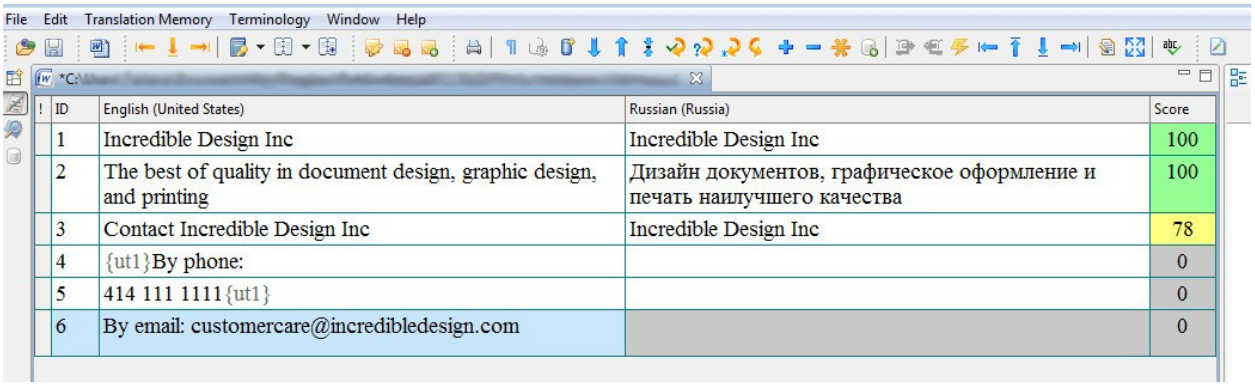
Figure 1: Computer Assisted Translation Workflow

CAT identifies and marks the segments in every new document according to the levels of similarity to the segments already existing in the TM database:

- 100% matches (a segment in the database matches a new segment completely);
- "fuzzy" matches (a segment in the database is similar to a new segments; there are different levels of "fuzzy" similarity, but a rather common practice is to set "fuzzies" to 99%-75%);
- no-matches (no segments in the database are similar to a new segment).

On the screenshot below (Figure 2), the segments "Incredible Design Inc" and "The best quality in document design, graphic design, and printing" have 100% matches in the TM and translations for these segment are automatically inserted (the company name in the original language and the slogan for the company were already translated for other pages of this imaginary website). For segment 3, "Incredible Design Inc" is a "fuzzy" 78% match; a translator now knows that the name of the company should be left in English

and has to revise the offered translation to reflect the exact meaning of the original. The rest of the segments have no matches in the TM, and no translation variant is provided.



!	ID	English (United States)	Russian (Russia)	Score
	1	Incredible Design Inc	Incredible Design Inc	100
	2	The best of quality in document design, graphic design, and printing	Дизайн документов, графическое оформление и печать наилучшего качества	100
	3	Contact Incredible Design Inc	Incredible Design Inc	78
	4	{ut1}By phone:		0
	5	414 111 1111{ut1}		0
	6	By email: customercare@incredibledesign.com		0

Figure 2: WordFast Interface with a File for Translation from English into Russian

Ideally, this workflow allows organizations to shorten translation time and, even more importantly, improve consistency. Consistency can often be a problematic issue in the technical translation industry, as tight deadlines and outsourcing often have several translators working on the same document or different documents for the same client (e.g., one translator working on a catalogue while another on the website). At the same time, translators still have the flexibility of changing the segments according to the context and have the possibility to investigate the purpose, function, context of the segments they are approving by referencing the complete technical text (sending a PDF of the complete text together with the segmented files for translation is common practice).

While CAT technology promotes consistency, the technical translation community has not accepted it without a certain degree of doubt. CAT technology does not differentiate between translation and localization because it does not translate or localize. By

segmenting text and requiring segment by segment translation, a CAT system, arguably, promotes translation over localization as it requires translators to conform to the same genres, styles, formats, and structures as in the source language. Many companies would not hire translators if they do not use a CAT system; however, many translators complain that segmentation and separation of content from presentation robs them of the context necessary for understanding the meaning and transferring it into a foreign language (e.g., when translators do not have a complete text for reference and/or are not paid for the time to do context examination). Consider, for example, the following description of problems related to context, quality, efficiency, and costs:

> …TM has occasionally created unrealistic expectations that it instantly provides substantial cost savings without any negative consequences for the quality of the translation. Even when there are exact matches, *the translator still needs to consider the text as a whole, and in the light of the new context in which the matched segments are to be inserted*. It is possible for TM to create a 'sentence salad' effect (Bédard 2000) when sentences are drawn (without adequate contextual information) from various translation memories created by different translators with different styles. A related problem, described as 'peep-hole translations' (Heyn 1998:135), concerns the cohesion and readability of the translation, which can be compromised for the sake of facilitating TM – for example, when translators avoid the use of anaphoric and cataphoric references, opting instead for lexical repetitions that can yield more exact or full matches. A study on consistency and variation in technical translation (Merkel 1998) suggests that while the consistency facilitated by TM is in

> keeping with the general aim of technical translation, *it is not always welcomed by some translators when the same segment appears in different functional contexts*.
>
> O'Hagan, 2009, p.50 (emphasis added)

O'Hagan sees the problems of CAT and TM as related to segmentation and separation of presentation from content in pursuit of efficiency and savings. With CAT, however, despite segmentation and separation, a translator can still have the possibility of seeing the complete text if the complete text is available in the source language and can also perform quality checks on the complete target text after the translation.

Content management strategies and technologies are another approach that promises to save time and money and improve translation consistency. While technical translators have been segmenting texts and separating presentation from content with CAT for a long time, content management brings a new problem for them—complete texts in the original language as a source of contextualization now become unavailable. By uncritically relying on content management, technical communicators risk returning to the view of technical translation as an arhetorical practice and foregoing any consideration of the importance of localization. Critical examination of the impacts of content management on multilingual quality is paramount for technical communicators to safeguard the importance of users' needs and to become leaders in global information development. For TC scholars such examination holds the promise of bridging the gap between academia and industry and influencing global TC practice. However, to understand the impacts of content management on multilingual quality, we first need to

complicate this strategy, as well as methods for information development and management that define it and technologies that enable it.

CONTENT MANAGEMENT: DEFINITIONS, PARADIGM SHIFTS, AND COMPLEXITIES

Content management strategies and technologies are sweeping the field of TC with their promise of achieving faster time to market, efficient use of resources, major production cost savings, *slashed translation costs, improved quality and usability of multilingual content*, improved workplace satisfaction, and increased customer satisfaction (Trotter, 2008, blog, emphasis added). The ever-increasing pressure to reduce time and costs of producing global technical documentation and the resulting push from industry to streamline text creation leads many TC workgroups to content management, which presents a potential solution to the problem of addressing the needs of the global readers under tight budgets and on short deadlines.

While there are multiple content management technologies on the market, including document management systems (DMSs), web content management systems (WCMs), and enterprise content management systems (ECMs), for technical communicators the most radical change has been brought by component content management systems. These systems approach "the problem of content management by using [usually XML] markup, [usually XML] metadata, and tools to break documents into component parts, to a level of granularity (e.g., paragraph level, sentence level, word level) set by organizationally defined information models, and labeling each part with metadata that describe its meaning and relationships to other content" (Clark, 2008, p. 39). Component content management systems allow writers to author, review, and then assemble chunks of

content in various outputs for various audiences and purposes. Throughout the dissertation, I will use CM as a method for managing content life cycle within an organization that allows improving content through the two-way relationship of input and output and CMS as component content management technologies that many TC work groups are implementing to replace traditional documentation methods and desktop-publishing tools: "applications that usually work over a computer network and have one or more databases at their core; they store content, as whole documents and/or as textual and graphical components; they mediate the workflow to collect, manage, and publish content with such functions as maintaining links among content sources and providing for revision control" (Dayton & Hopper, 2010 based on the extended definitions of content management systems offered by Doyle, 2007; Rockley, Kostur, & Manning, 2002).

CM introduces an immense paradigm shift into TC. TC practitioners are moving away completely from traditional ways of creating texts (authoring complete documents) towards single sourcing (SS)—a strategy for authoring chunks of content once and then (re)using them multiple times in various texts. Rockley (2001) defines four levels of SS:

1. *Identical content, multiple media.* Technical communicators develop documents in one medium and then output it in other media with the same content (e.g., a print user guide as a PDF on the website in the help section). Content is generally created at the document level and supported by desktop-publishing tools.
2. *Static, customized content.* Technical communicators customize content to meet the needs of their audiences. They tag content using a markup language and publish only the content appropriate for a particular output or media. Content is

static but the presentation of content changes depending on the medium and audience needs. Content is created at the chunk level.

3. *Dynamic, customized content*. Texts are put together according to users' needs. Technical communicators also tag content with a markup language such as XML and store chunks of content in a database. Users can access information from the database (a combination of user profiles and user selections).
4. *Electronic performance support system*. Texts are created "just-in-time" based on user needs. Systems learn to predict these needs based on users' actions.

The shift starts at level two of SS, where traditional methods yield to object-oriented methods, since at level one content is still created on a document level and the process does not require a CMS. While level four has not impacted the practices of TC quite yet, levels two and three are driving the paradigm shift in TC.

When technical communicators work with self-contained chunks of content in SS, they need to adopt a method for handling this content, including how it is created, stored, retrieved, formatted, and styled for delivery (Hart-Davidson, 2010)—CM. According to Hart-Davidson, CM as a method is a much wider concept than SS in that it has four distinct goals (emphasis added):

- Distributing authoring tasks and responsibilities among members of a group
- Authoring and storing content in ways that enable multiple-audience adaptation, including the translation and localization of content for specific groups

- Authoring and storing content in ways that permit multiple output formats to be derived from a single repository of information (*single sourcing*)
- Authoring and storing content in ways that facilitate systematic reuse within and across organizations.

In CM, the word "content" allows thinking of the life cycle of information, and the word "management" aims at making the CM processes "explicit and repeatable, identifying and correcting inefficiencies, and providing for some mechanism of process control" (Hart-Davidson, 2010, p. 130). The process of CM requires "the dynamic combination of information architecture, business management, software and network engineering, content creation, and publications development" aimed at "collecting, managing, and publishing" texts (Boiko, 2004, p. 70).

Definitions of SS and CM are abundant in both scholarly and practitioner TC literature (e.g., Ament, 2003; Clark, 2008; Dayton & Hopper, 2010; Hart-Davidson, 2010; Rockley & Cooper, 2012). In fact, it seems that every author who describes, critiques, advocates, provides best practices for SS and CM has a definition—arguably a sign that the methods, tools, and practices are still new enough and developing fast enough to require constant re-defining. At the same time, there are continuous efforts in TC to produce more precise, all-encompassing descriptions for both SS and CM. For example, in 2011-2012 the SS Special Interest Group (SIG) of the Society for Technical Communication (STC) issued a call for re-defining SS and standardizing the terms we use to describe this method. Starting with the working definition the group produced in 2001 "...using a single document source to generate multiple types of document outputs; workflows for

creating multiple outputs from a document or database source..." (SS SIG of STC, listserv discussion, November 2011-February 2012) the group questioned, for instance, the necessity to include into the definition the audience and the uniform voice; multilingual capabilities; rules for creating source texts to make SS feasible; the two-way relationship of content in SS (content shifts between the roles of input and output); the possibility of satisfying the needs of a whole company with a single repository; and the operability issues. The group also challenged the very terms used to define SS (chunks or segments or units or modules) and even the possibility/necessity of producing a uniform definition. While accepting that backgrounds, scenarios, and the specific needs of a work group would require extending the definition for each particular case, the group concluded that "arriving at a real definition is critical to our efforts and a core exercise of our philosophy." Here is the final version of the definition:

> Single-sourcing is a methodology that requires a single repository of content from which writers choose some or all of the content to create multiple outputs in different formats, for different audiences, for different devices, or for other customized material. Source content is, as much as possible, written and structured consistently, broken into self-contained chunks, and is based on industry standards.

This discussion and, perhaps, even the resulting definition emphasize the segmentation of practices and understandings of SS and CM in TC. It is worth noting that at about the same time another group (LinkedIn "Chunk it") also made a very similar observation: "It is interesting how segmented this profession is in terms of its tools, techniques, and vocabularies" ("Is 'chunk' still relevant?" listserv discussion, September-December 2011). What both groups agreed upon is that chunk is a relevant term for describing

building blocks of texts that facilitate re-use in SS with a CMS; Swarts (2010) notes that "chunks of text always point to multiple contexts" (p. 134). However, chunks should not be confused with topics, which are relatively independent information types that serve particular functions. For example, in Darwin Information Typing Architecture (DITA), topics are the "smallest independently maintainable unit[s] of reuse" that allow authors to "cover a particular subject, or answer a particular question, without dwelling on the various places the topic might end up being read" (Priestly, 2001, p. 152).

In the traditional TC paradigm each writer controls the lifecycle (creation, editing/reviewing, publishing) of a text and, as a result, there is a lot of similar information in different texts that is written in different ways (see Figure 3). The shift in this paradigm requires carefully thought through strategies for addressing rhetorical and organizational needs of a company, knowledge acquisition, change management, and social and political implications of the new method.

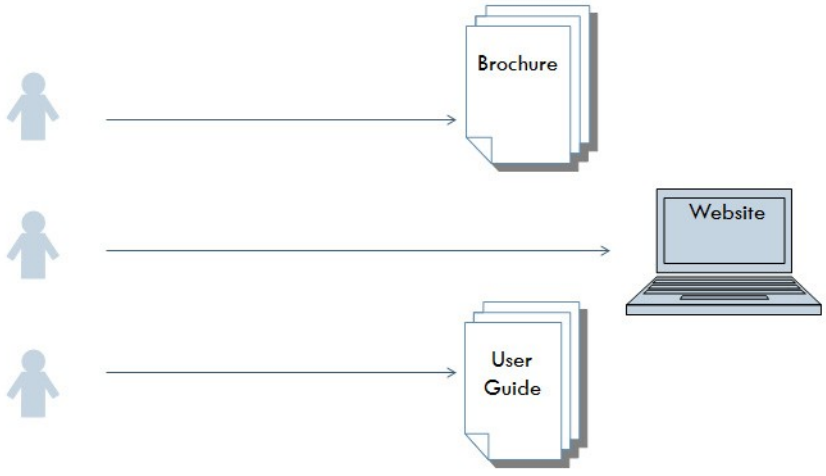


Figure 3: Traditional Paradigm

In the new paradigm (see Figure 4) multiple contributors create or import chunks of content using an authoring system and an information model; editors, reviewers, and

authors update the chunks based on company needs and workflows. Then, through a publishing engine, documents in different genres and media are created from the database of chunks.

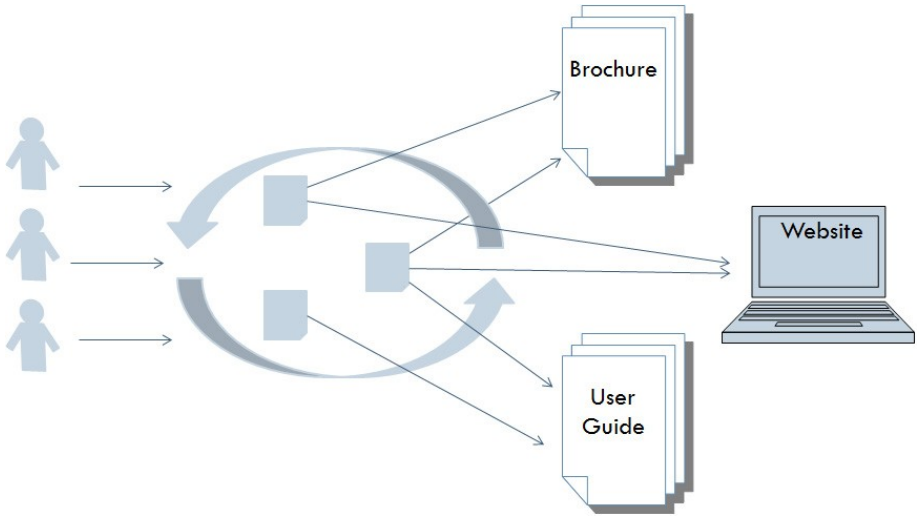


Figure 4: New Paradigm Based on Content Management Strategies

The paradigm shift with all its promise comes at a very high cost, both literally and by way of radically altering decades-old processes of communication and text creation and foregrounding storage, tagging, and structure in unprecedented ways. As a result, TC forums are sprouting with multiple related discussions, while conferences are packed with sessions on suitable XML frameworks, data models, content strategy, and structured writing.

The shifts in the TC paradigm and changes that SS, CM, and CMSs bring to TC have been a focal point for a growing number of TC scholars. Some of these authors strive to re-assure and encourage both practitioners and academics by outlining the leadership opportunities that CM provides and suggesting strategies for overcoming some of its potential dangers. For example, Whittemore (2008), Clegg-Gilbert (2004), and Sapienza

(2007) share an overall optimism for CM practices and for the importance of markup languages such as Extensible Markup Language (XML), a tool that permits to define and share structural and semantic metadata standards. Evans (2009) tries to reassure technical communicators that CM "may provide opportunities for them [technical communicators] to move into other positions on the technical writing team that are more desirable, such as manager, editor, graphic designer, and information architect" (p. 140). McDaniel (2009) adds that technical communicators already have the necessary skills for these leadership roles, since they have knowledge and background "supplemented with humanities expertise" that "may improve the sterile and positivist pathways and applications of modern content management techniques" (p. 16).

Many are worried, however, that SS, CM, and CMSs are technologizing and streamlining processes that should be complex and rhetorical. These researchers argue that CM, while it should be taught and understood, must also be critiqued and considered in terms of its rhetorical impacts on more traditional writing processes. Below are their concerns:

- *Arhetorical practices*. Bacha (2008), for example, argues that CM returns writers to "positivism," because it emphasizes arhetorical practices and turns technical communicators into software implementers instead of writers. Clark (2007) suggests that CM's focus on reuse emphasizes consistency over clarity and ignores what research teaches us about genres. Many have suggested that content management can turn rhetorically complex writing jobs into easily outsourced "tool" jobs (e.g., Carliner, 1997; Dicks, 2009). Others, however, point out that CM rather adds more complexity to the rhetoric of TC, because the concept of re-

use is not rhetorically neutral and has the purpose of managing relationships (Swarts, 2010).

- *Changing relationships between writer and text*. CM is a force that pushes technical communicators to rethink traditional concepts, such as knowledge (Applen, 2002) and writer and document (Albers, 2003; Carter, 2003).
- *Changing balances in organizational needs and rhetorical theory and practice*. CM can create new problems with "inflexible genre systems" and "rigid and proprietary genres" (Clark, 2007, p. 9; also c.f. Honkaranta, 2003). Johnson & Fowler (2009) point out that "if a business or corporation relies on the development of new knowledge or the rapid exchange of existing knowledge, it must rely on the seemingly disorganized and uncontainable flow of human interaction and communication" (p. 54).
- *Methods versus tools*. Implementation of CMSs can privilege organizational needs over those of end-users and chunking over editing, limit perceptions and potential of technical communicators, and contribute to under-theorizing (Clark, 2002). Even when a CMS appears to be a good solution, it still needs to become more usable (Whittemore, 2008) to offer technical communicators affordances to utilize the stored information in new and innovative ways. Some authors (e.g., Andersen, 2011, McDaniel, 2008, Whittemore, 2008) also argue that scholars in TC need to take a more active role in shaping new CM technologies, rather than being told what technologies we should teach and research.

- *Implementation*. Implementing a CMS effectively is not trivial: installation and training are not always seamless, and failed attempts can be very expensive and time consuming (e.g., Andersen, 2011), a situation also described in non-academic TC discourse (e.g., Abel, 2007; Bailie, 2007; Dayton & Hopper, 2010; Hamer, 2007).

In addition to the concerns of scholars and consultants about the rhetoric and implementation of CM, many TC work groups report unhappiness with the CM methods and tools they are using (Dayton & Hopper, 2010). About 25% of respondents in a 2008 survey of STC members were considering a change in methods and tools, while between 10% and 50% (depending on the definition of "failure") reported that they had experienced a failed CMS implementation. The respondents attributed the failed implementation to a CMS's difficulty, its cost, and its overall inability to address the needs of the work group. The desire to change the current methods and tools was connected to significant downsides or tradeoffs, including awkward production/slower production/more work for writers, difficult or slow transition/learning curve/team member resistance, bugs and technical glitches, lack of ability to customize, conversion issues, technical skills demands, and loss of process control (Dayton & Hopper, 2010).

It is most interesting that TC work groups report the lack of ability to customize and loss of process control as one of the major reasons for dissatisfaction, while one of the driving factors for adopting a CMS is the growing need for technical translation (Dayton & Hopper, 2010), a deeply rhetorical and creative process unimaginable without customization and adaptation. In what follows I discuss the discourse that brings together SS, CM, CMS and multilingual quality—for better or for worse.

Single Sourcing, Content Management, Component Content Management Systems and Multilingual Quality: Where Do We Stand?

The potential to improve multilingual quality, all the while saving on technical translation, is consistently mentioned as the top reason for adopting CM methods and technologies (e.g., Hackos, 2006; Rockley & Cooper, 2012). Scholars also note the potential of CM to provide opportunities for multiple-audience adaptation in translation and localization (e.g., Hart-Davidson, 2010). Indeed, if CM enables creating texts differently for different audiences based on pre-defined information models, why shouldn't it be possible to create different texts for different languages and countries (see Figure 5)?

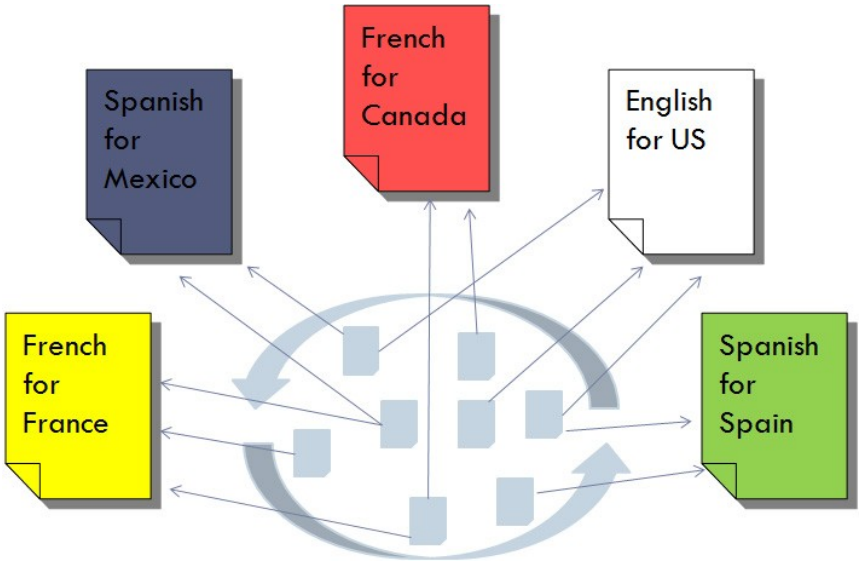


Figure 5: Potential Multiple-Audience Adaptation with Content Management

The introduction of SS strategy, CM methods, and CMS technology into creating texts in the original language, however, brings a paradigm shift to the practices of technical translation as well.

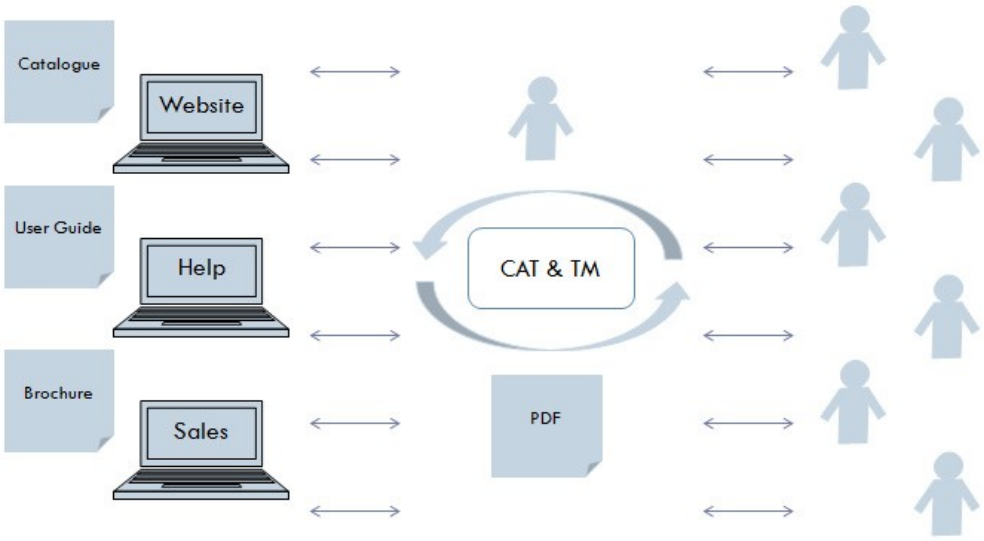


Figure 6: Pre-Content Management Technical Translation Practices

In Figure 6 all documents are processed with CAT software by a *project manager* who then assigns CAT translation files to one or *several translators* and provides PDFs of source documents for context references. With the introduction of a CMS, technical communicators start tracking changes in the source text, so that only new or modified chunks of content get sent for translation (see Figure 7). The *project manager* now receives only the new chunks, which he or she then processes with CAT software to promote re-use further and then sends the segmented chunks of content to *freelance technical translators*.

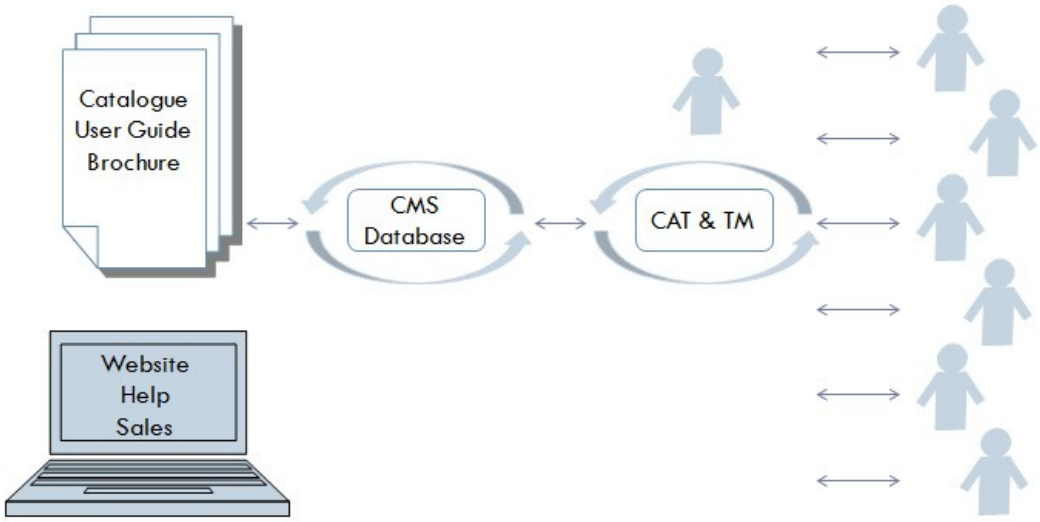


Figure 7: Technical Translation Practices Post-Content Management

The new paradigm of technical translation, while providing further opportunities for promoting consistency and efficiency through increased re-use, further strips the text for translation of its context (as compared to CAT) and complicates the choice between translation and localization: On the one hand it provides opportunities for adapting texts to specific audiences through assembling texts differently for different cultures; on the other hand the affordances of technology promote sameness of information between genres and languages. The discourse in TC reflects this rhetoric of contradiction in the implications of CM for multilingual quality. The information in the table below is extracted from scholar, practitioner, and vendor discourse in articles, white papers, sales materials, blogs, and forums.

SS, CM, CMS are good for technical translation because…	SS, CM, CMS are problematic for technical translation because…
they help adapt content for different audiences (e.g., Hart-Davidson, 2010; Hysell, 2001; Rockley & Cooper, 2012; Ruyle, 2001) and improve understanding of end users' and alternatives for meeting their needs (e.g., Mazet & Matthe, 2010; Sereno, 1999; Wiles, 2003)	they promote "reducing internationalization to literal, linear translations of content" and are an "enormous incentive to not improve phrasings, change designs, or add user-requested content" (Clark, 2007)
they automate many translation/localization processes (e.g., Freeman, 2006), thus making these processes a lot cheaper and less prone to human error (e.g., Broberg, 2004; Eriksson, 2012; Hackos, 2012; Rockley et al., 2002; Shapiro, 2008; Steele, 2001; Yap, 2012)	they promote the "lost in translation" effect, since translators cannot spend much time getting to know the background information for chunks of content (forum and blog postings; Batova & Clark[1], working paper)
they make translation/localization easy (e.g., Cowan, 2010; Samuels, 2011) and more efficient (Harrison, 2005; Rauch et al., 2010)	they do not account for the "linguistic, psychological, and cultural principles underlying reading comprehension" (Gattis, 2009); they do not account for the complexity of technical translation, as they can help organize translation/localization tasks, but require human translators to handle the actual tasks (forum and blog postings; Boiko, 2004)
they make the quality of translated/localized texts better (e.g., Eriksson, 2012; Rockley et al., 2002; Ruyle, 2001)	they disregard technical translation best practices and key concepts (forum and blog postings; Ament, 2003; Batova & Clark, working paper)
	they create problematic legal implications (Batova & Clark, working paper)
	they do not account for classification of languages into analytic and synthetic (Batova & Clark, working paper)

Table 3: Imbalanced Discourse of Content Management and Technical Translation

Table 3 clearly illustrates that that there are many problematic implications of SS, CM, and CMS for multilingual quality and the benefits do not outweigh the challenges. It also

[1] Batova, T., Clark, D. "Managing Content for Global Audiences: A Critical Look at Content Management in Translation/Localization Projects."

shows (judging by the number of authors cited) that there is much less discussion of the problematic implications than of benefits of CM, especially in official TC publications. Best practices advice for addressing the rhetoric of CM in multilingual projects does not help clarify the implications of CM for multilingual quality, since it is extremely fragmented and sometimes even contradictory. While there is no information on the comprehensive treatments that provide a broad understanding of CM in multilingual projects, I have found the following tips for overcoming common problems:

- Authors and translators must align their efforts; they need to collaborate to avoid content that is "bloated, disorganized, and inefficient" (Fenstermacher, 2007, p. 7); they need to keep "topic granularity low" and "document structure simple" (Zydron, 2006).
- Translation should be integrated as early as possible into the document creation process, and CMS should be used to track modifications in the source document (Dehaes, 2006; Hackos, 2006; Hoft, 1995).
- Authors can use semantic tagging to distinguish translatable and non-translatable text (Harrison, 2005).
- Authors can create separate CSS for different languages (Rockley & Cooper, 2012)[2].
- Authors can create notes for translators about how to translate specific content with an XML file, identify elements that need to be translated according to specific rules, and name attributes according to their purpose[3] (Cowan, 2010).

[2] How to do that is not clarified, however.

- In DITA paradigm, conrefs[4] should be used sparingly for "highly inflected and gender sensitive languages such as most Slavonic and Germanic languages" (DITA OASIS Translation Subcommittee).
- Writers need to understand how to index topics for translation to get the best possible results in re-use (DITA Oasis Translation Subcommittee).

Based on the fragmented pieces of advice, it is difficult to develop a complete picture of the mission-critical practices; instead, we see only bits and pieces as independently working communicators attempt to solve individual, idiosyncratic problems. Even more importantly, authors advocating SS, CM, and CMSs do not mention localization. Some of the suggestions actually contradict the benefits of re-use by returning to the pre-CM paradigm of translation (emphasis added):

> It is recommended that the translator be provided with a *composed version of the source text to review and understand the context of the text* in which the conref appears. (…) languages where the product name is treated differently depending on context (…) require that *all versions of each topic* that mentions the product name must *be translated separately*.
>
> DITA OASIS Translation Subcommittee

Unfortunately, some technical communicators discount CM-determined problems with multilingual quality as false ones; they state that the knowledge of genres where translated chunks can be used is only marginally useful to the translators and compare

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[3] The author uses localization in its narrow definition: "translation of all localizable material in software products, such as user interface strings, icons, error messages and other text."

[4] Content reference attributes provide a mechanism for reuse of content fragments—building blocks smaller than topics that store a reference to other elements and can be processed to replace the referencing elements with the referenced elements (DITA OASIS).

CMS and CAT processes (based on discussion prompted by a blog posting). Others claim that by writing perfect DITA topics that are "short enough to be specific to a single subject or answer a single question, but long enough to make sense on its own and be authored as a unit" (blog posting) technical communicators can eliminate any potential multilingual quality issues for technical translators.

However, some technical communicators see many practices of CM as problematic for multilingual quality. They outline such contradictions as the level of granularity that works best for translation. Using sentence level segmentation provides better matching (better consistency), while segmenting text at the paragraph level improves the quality of the translations: "you may need three sentences in Spanish to translate two English sentences. The resulting Spanish translation will read better if the paragraph is translated as a block instead of as isolated sentences" (DITA OASIS). They question the assumptions about TC workplace practices imposed by the promises of CM:

> When we talk about the advantages of DITA, we assume people are using good practices; we shouldn't assume that the alternatives are created with bad practices. (…) Articles about DITA ROI [Return On Investment] often give you rules of thumb to use in your calculations. Their claims are almost always based on an unstated assumption that your current authoring environment is the most inefficient one possible, and even then their claims can be over the top. It is prudent to ignore this advice and instead go to your translation vendor to find out what your cost savings might be. (…) The money/time saved by reusing out-of-context translations, will be spent (if not more) on the editing to fix any context related errors. The segmentation of the source text creates a problem that needs to be addressed at some point, either

> at the translation or at the editing step. If the cost of making sense of out-of-context translation comes out of the translator word rate, buyers have a problem other than cost: retention of their resources. A translator will only take a project like this once. A segmented view of the standard might make buyers lose the sight of the business picture.
>
> http://focusonreaders.blogspot.com, October 2 2012

In addition, it is virtually impossible to find examinations of the impacts of CM on multilingual quality in translation literature, even though CMSs are rapidly becoming a staple for working with multilingual technical documents (e.g., CM is often only briefly mentioned in chapters like New Technology in New Millennium). Few publications devoted to technical translation advise developing an "understanding of the possible end-uses of translated content" and gaining a "macro-prospective on quality control and worldwide process alignment" (Lyons, 2013, p. 21), without stating how to do so. At the same time, some technical translators wonder if their clients, technical communicators, are willing to pay for researching such possible end-uses and context rather than per word of translation (blog posting).

Why is it important to provide a comprehensive analysis of the implications of CM for multilingual quality and why is such a comprehensive analysis absent? The common assumption that technical translation as pragmatic and arhetorical, I argue, explains why there isn't much scholarly discussion of CM's implication for multilingual quality in the scholarly translation literature; the separation of TC and technical translation largely explains the lack of attention in scholarly TC publications. However, delegating

translation of technical texts to technology, disregarding localization needs, and outsourcing without a clear understanding of what this means for the quality of multilingual texts are the practices that challenge the skills of technical communicators and their positions in their organizations. In "Coming to Content Management: Inventing Infrastructure for Organizational Knowledge Work" Hart-Davidson et al. (2007) note that

> … we are still watching quite fine-grained changes in writing practices due to single sourcing, localization, and standards-driven content development. Here again, it is still unclear if these changes will result in a deskilling of writing work. If there is any area of work where the careful attention of groups of researchers is needed, it is on writing practices at places and times where these market, organizational, and rhetorical vectors intersect.

These groups of researchers face challenges that can best be overcome by tight collaboration between scholars and practitioners in TC and technical translation through combining the experience and rhetorical knowledge of CM methods and technologies, global TC, technical translation complexities, practices, and technologies. Without such a joint expertise we run the risk of producing work that privileges some factors while disregarding others.

While CM promises to improve quality of translated technical documents, it also seems to prioritize definitions of quality that focus not on rhetoric or persuasion, but on information delivery (e.g., Andersen, 2008), consistency in structure, terminology, and writing guidelines (e.g., Rockley, 2001), and consistency and uniformity of up-to-date content (e.g., Hysell, 2001; Ruyle, 2001). The research on "contextually-appropriate

heuristics for defining and measuring quality" (Spilka, 2000) in multilingual CM has promise for strengthening TC scholarship and building stronger ties to industry. This research is also an opportunity to highlight the value added of technical communicators in workplace contexts through their leadership and advocacy of a multiple-stakeholder discussion of quality. Some research in this direction is already under way (e.g., Sapienza, 2004, who identifies new quality issues that SS brings with it, such as testing presentation versus testing storage, testing-as-you-go, and blurring the roles of developers and users). However, such research needs to be grounded in the rhetoric of technical translation to make the research base in our discipline more robust and viable and to address the challenges CM presents for translation and localization processes.

A deeper rhetorical understanding of what SS and CM mean for multilingual quality also has the potential for positioning technical communicators in the knowledge-centered roles of "gardeners" (cf. Hart-Davidson, 2001; Nardi & O'Day, 1999) and "symbolic-analytic workers" (cf. Durack, 2003; Hart-Davidson, 2001; Johnson-Eilola, 1996; Johnson, 1998; Slattery, 2007). As "gardeners," technical communicators "translate ideas and processes to make continuous improvements to workplace practice" (Hart-Davidson, 2001, p. 154); as "symbolic-analytic workers" they employ competencies in "abstraction, experimentation, collaboration, and systems thinking to work with information across a variety of disciplines and markets" (Johnson-Eilola, 1996, p. 248). The ability to combine rhetorical knowledge from different though related areas (CM and technical translation) to improve multilingual quality practices would position technical communicators as strategic decision makers and process designers of information development. This ability to acquire knowledge from several disciplines and synthesize it to guide writing practices

is a strategically important skill that needs to be taught to the new generation of technical communicators. In such a way my research in global CM is an important contribution not just to practice and scholarship, but also pedagogy.

To contribute to quality debates, academics could argue

> against endorsing just one or a few quality definitions over the others, unless doing so would be appropriate in particular workplace contexts and situations. They could demonstrate that an ideal first step toward achieving quality would be to identify and then examine all possible influences and constraints that could affect the quality of documentation produced within a particular workplace context, and an ideal second step would be to identify which of those influences or constraints could determine whether, and to what extent, a document will succeed or fail.
>
> Spilka, 2000, p. 211

Such participation of TC scholars in multilingual quality debates is more important than ever with the advent of CM. In light of challenges posed by CM for multilingual quality, there is currently no research that combines the focus on CM and technical translation.

In this dissertation project I investigated and analyzed the challenges of CM for multilingual quality through a qualitative study of a global TC work group that had implemented a CMS; the study was guided by the following research questions:

- **How** and **why** does adoption of CM challenge global TC practices?
- **How** do multilingual quality stakeholders approach quality of multilingual technical texts produced with CM? **Why** do they do it this way?

- **How** do the changes in multilingual TC brought by CM and the stakeholders' approaches to multilingual quality influence the roles of TC stakeholders within workplace contexts?

By seeking answers to these questions in this project I also aimed at identifying strategies for advocating contextualized multiple-stakeholder definitions of multilingual quality.

CHAPTER 2: RESEARCH METHODOLOGY

In the previous chapter I reviewed the dilemmas of multilingual quality and CM and argued for contextualized multiple-stakeholder approaches to multilingual quality. In this chapter I discuss a 12-month long qualitative study of multilingual quality and CM that I conducted between October 2011 and October 2012. The goal of this project was to develop strategies for creating contextualized multiple-stakeholder approaches to multilingual quality through a study of the ways technical communicators shape multilingual quality in global TC with CM and the ways the work and positions of technical communicators are, in turn, shaped by CM and, in particular, by their understandings and approaches to multilingual quality in CM.

In summer of 2011, while accompanying a group of students from a US university during their internships in China, I was on a tour of facilities of a US manufacturer, DreamMedi[5]. During this tour our guide, an employee of the company, mentioned that multilingual CM helps DreamMedi to attract users by providing high-quality technical documentation in multiple languages. The guide, however, did not answer my questions about the workings of multilingual CM at DreamMedi during our tour. Right before our group was leaving the facility, the guide told me that the CM system was not working as everybody had hoped, and multiple people had to work hard to create good quality technical documentation. The apparent tension in the representation of technology and the roles of multilingual quality stakeholders made DreamMedi an interesting setting for my study. In this chapter I begin by describing the study site and participants and providing a rationale for my case study design and methodology. I then discuss methods I

[5] Names of the companies, employees, industry, and software have been modified to preserve the confidentiality of the participants.

used for collecting data and methodological and theoretical approaches I used to analyze the data. I conclude this chapter by explaining my strategies for ensuring ethical study design and representation of participants and phenomena I was observing.

STUDY SETTING

Study Site

Since the goal of my study was to investigate quality understandings and practices in multilingual CM, I needed to work with a company that had been using CM strategies and a CM technology for creating multilingual technical documentation for several years. These criteria, however, proved to present problems for negotiating access. Companies that have been using CM for several years were not always forthcoming in allowing an outside researcher to study their practices. Even though they realized the value of research, they expressed anxiety at losing their competitive advantage if research on CM implementation became public knowledge.

To overcome the problem of negotiating access, I relied on the principle of reciprocity in qualitative research. Since I had some knowledge of the CM workings of DreamMedi through my experience in China, I focused my efforts on presenting the value of my research project for this particular company. I clearly stated that one of the primary goals of my research was to help the company evaluate the possibilities of CM for custom-tailoring technical materials for audiences overseas based on their cultural and technical needs (and, thus, to improve multilingual quality). After providing DreamMedi with a detailed outline of my proposed research activities in the company, I put emphasis on explaining the practical benefits of my deliverables. The company saw the value in using

my final report for improving the quality of their multilingual texts and for creating training materials for new employees of the company on the current global TC work processes.

DreamMedi also presented an excellent study site due to another reason—the selection of languages they are translating into. One goal for designing this study was to exclude languages I speak from the analysis (Russian, German, and French); DreamMedi was translating into Spanish for Mexico and Latin America and into Simplified Chinese. This criterion was essential because I wanted to analyze multilingual CM practices and create strategies for multilingual quality discussion between stakeholders that would be as universal as possible. Connecting the project with the languages I speak would have created a risk of limiting the quality discussion to the linguistic peculiarities of these languages and, thus, would have limited the overall implications of my study. In addition, it is not realistic to expect that technical communicators would speak all the languages their companies translate into. So, making the discussion independent of my fluency in foreign languages promised a more realistic and practical view of the workplace. If TC scholars and practitioners want to develop effective strategies for multilingual CM, we need to start by combining our theoretical knowledge and understanding of technology best practices with a practical and realistic view of the workplace.

DreamMedi is a world leader in manufacturing medical equipment. It is a multibrand corporation with central offices in the US and manufacturing and assembly facilities throughout the world. The company prides itself on producing equipment that is high-performance but energy-efficient, as well as easy to install and maintain. It consists of a number of business units, with each one specializing on a particular equipment

implementation. Technical documentation produced by DreamMedi includes buyer catalogues, buyer brochures, installation manuals, maintenance manuals. In addition, the company has information on the website (in three languages) and in a desktop based sales system in English that serves as an equipment configuration tool for independent sales people. Since one of the advantages of equipment by DreamMedi is the ease of installation and maintenance, technical documentation by DreamMedi is inherently connected with the company's marketing endeavors as a way of supporting the representation of this advantage.

Because of its growing presence in China, Mexico, and Latin America, DreamMedi created an international unit to take over technical documentation management in English and to work on technical documentation for Spanish for Mexico and Latin America and Simplified Chinese. To gain a competitive advantage, the company also wanted to provide not just the technical documentation and the website in Chinese and Spanish, but also an easy way to configure products in these languages. However, the software for the desktop version of the sales system had problematic capabilities for foreign languages, and updating the desktop software in China, Mexico, and Latin America presented problems as well. In addition, with two new languages, management of all the content for all genres in three languages became problematic. Similar to many other companies today, DreamMedi was facing pressures to make technical documentation production in several languages more fluent and effective. Moreover, one of DreamMedi's contractors had implemented a CMS and insisted that for DreamMedi to keep their business, DreamMedi needed to follow suit.

Study Participants

The number of my study participants grew throughout the first half of my project. When I initially approached DreamMedi as an outsider, my focus was going to be on technical communicators and technical translators. However, soon I realized that multilingual quality stakeholders were located in different business units, different departments, and different countries; they had different roles within the company and different professional and educational backgrounds. While I asked and investigated myself which stakeholders it would be beneficial to interview, I also encouraged participants to put me in touch with stakeholders who they thought would be able to provide valuable answers to my questions. I found that my interest in the study and my energy were "infectious and quite useful in gaining access" (Marshall & Rossman, 2006, p. 74).

Staying flexible with participant inclusion was advantageous for several reasons. First, following actors and texts (Callon, Law, & Rip, 1986; Spinuzzi, 2008) allowed me to trace how textual knowledge passes through the hands of many people and multiple technologies, playing a role in the perceptions of stakeholders' expertise and of the quality in multilingual CM. Second, it helped me "illustrate the benefits of identifying and analyzing multiple contributors to the quality of documentation, without giving primacy to any single contributor" in order to discover multiple perspectives and new "layers of meaning" and gain "full, mature appreciation about what happened, and why" (Spilka, 2000). Third, letting current study participants invite additional stakeholders provided me with an invaluable picture of implicit perceptions of others' roles, responsibilities, and capabilities within the company.

So, I kept including new participants, diligently explaining my study, asking about willingness to participate, and filing the signed informed consent forms. This is the final group of the participants:

- *Three TC stakeholders of the international unit*

  The international unit consisted of Rose, a writer/graphic designer who had been with the company for several years; Melissa, a former sales specialist from a different unit, whose task is to input legacy material into CM-Master; and Kelly, a new hire, who recently had graduated with a degree in digital media production. I call these three participants TC stakeholders of the international unit further on, since they participated in activities that characterize TC. These three TC stakeholders were the main three participants, since they were the nexus of technical communication, technical translation, and CM activity in DreamMedi. Only the international unit had access to CM-Master and used it on a regular basis.

- *Head of IT*

  While Patrick, head of the IT, is not a direct multilingual quality stakeholder, he participated in selecting, implementing, and troubleshooting CM-Master. While Patrick did not use CM-Master every day, he was the one who received the training from the developer. Thus, Patrick's perspective provided an important contribution to the picture of the positions of the TC stakeholders within the company and their relation to CM technology.

- *Three application engineers*

Ben and Stacey were the heads of two business units that participated in creating technical content in English that the international unit later re-used. Laura worked on Ben's team. She was the person who created content in English that went into the English-language desktop sales software. Including the perspectives of these application engineers allowed me to get surprising but significant insights into the communication, roles, and localization initiatives of DreamMedi.

- *Corporate marketing department employee*

Elaine's task was to make sure that corporate branding was represented adequately throughout most genres of technical texts created by the company. Previously, she was also the one to handle translations, but her role changed once the international unit was created. Elaine did not work with CM-Master, even though she mentioned that a CM software could make her work easier. While Elaine did not participate in the multilingual quality anymore, her perspective helped create a more comprehensive picture of the changes in translation practices.

- *Mexico and Latin America marketing specialist*

Marco worked in international marketing, and he was the main source for reviewing Spanish information and documentation, since he was bilingual. Marco had a business and marketing degree and his main role was promoting DreamMedi's products in Mexico and Latin America and learning what specifications could make DreamMedi's products more popular in the respective countries. Marco's insights proved to be invaluable in creating a comprehensive picture of DreamMedi's

communication about multilingual quality and technical translation, as well as the roles of TC stakeholders in both.

- *Technical documentation/marketing specialist and application engineer in China*

Tammy and Alex were both native speakers of Chinese. Tammy worked with documentation in Chinese and helped find a new translation company (local Chinese company in China). She was the reviewer for translations completed by this company. Alex was also located in China, but he traveled often. He was an application engineer and often the main source of information for Tammy. He didn't have any contact with the Chinese translation agency, but often proofread and commented on their translations to help Tammy. The perspectives of Tammy and Alex helped me explore the multilingual quality practices and communication about it at DreamMedi.

- *Translator (English > Spanish for Mexico and Latin America)*

David worked in-house on a freelance basis. He was introduced to DreamMedi as a bilingual graphic designer, and then he was asked to complete a sample translation, which impressed the international unit and Marco. Since David had a degree in graphic design, he also could DTP translated texts when DreamMedi requested this service.

- *Open World Translations company (English > Simplified Chinese)*

Open World Translations was initially found by Tammy, who asked her former classmates working in positions similar to hers to advise which company to use. I

was not able to form a connection with the Open World Translations, since the company did not wish to participate in my study. In my evaluation of the participation of the translation company in CM and multilingual quality, I was only able to rely on their self-representation through their website.

In this study it was important for me to learn the perspective of both TC stakeholders and technical translators on the multilingual quality understandings and practices with CM. However, the stories of Ben, Laura, Marco, Tammy, and Alex provided critical, even though unexpected, details of the complexities and problems in multilingual TC at DreamMedi, which I describe in Chapter 3. While several study participants did not have direct participation in multilingual quality, their input helped me gain a deeper understanding of communication pathways about TC at DreamMedi (Ben, Laura, and Stacey), the changes in the TC practices (Elaine), and the positioning of CM software (Patrick). Working with these three participants who are not direct multilingual quality stakeholders also provided an invaluable picture of how the roles of multilingual quality stakeholders are perceived outside of their immediate community and allowed me to delve deep into what was really happening.

Study Design and Methodology

DreamMedi provided me with a rich context for analyzing the rhetorical, political, social, and cultural contexts into which the CM strategies and technologies were embedded and exploring multiple layers of complexities that surrounded the multilingual quality practices after the implementation of CM. To examine the what, how, and why questions of multilingual quality and CM and to address the gaps in the literature I discussed in the

previous chapter, I engaged in a qualitative exploratory case study[6]. Yin (2009) defines a case study as "an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (p. 18). DreamMedi presented a meaningful context for studying quality in multilingual CM, which was embedded into the complexities of rhetorical, political, technological, and cultural functions of the company. The case study approach was also useful in exploring the particularity and complexity of a single case (Stake, 1995), because it helped trace how particular participants based on their background and competencies together with particular CM technology shape the practices of multilingual quality within the genres of TC specific to DreamMedi.

Yin (2009) adds that in a case study inquiry, multiple sources of evidence are required, since there are usually "many more variables of interest than data points" (p. 18). Since I explore the understandings and practices of quality of multiple stakeholders with various roles and backgrounds who are located in various geographic regions, the case study approach provided me with the flexibility of evidence gathering. This flexibility helped me gain interesting insights into the complex context of situatedness of quality in multilingual CM: the discursive, the social, the cultural, the material, and the technological dimensions of experience in their fundamental interconnectedness (Read, 2011) or "the work across a distributed, interdependent network" (McCarthy et al., 2011, p. 372). A case study approach also allowed me to obtain extensive evidence from

[6] I received Institutional Review Board (IRB) approval for all methods of data collection, and sought additional approvals when I had to modify my approach (e.g., including additional participants and methods for collecting data). In addition, the legal department of DreamMedi signed a written agreement to my study.

multiple sources and angles within a 12-month timeframe (October 2011 through October 2012). Through a variety of data collection methods, which I describe in the next section of this chapter, I was able to follow genres in the complex organizational mediation of the activities and roles of the stakeholders of multilingual quality. My goal was to trace the circular (re)negotiation and (re)creation of texts in three languages in the TC network of CM as they were continuously updated and reassembled.

An additional goal in this project was to look at any possible tensions and contradictions that change the existing paradigm of multilingual technical communication and quality. Case studies are exactly the kind of methodology that offers "researchers and participants alike the opportunity to make sense of [the] tensions." (Kastman-Breuch, 2010, p. 164). By conducting a case study, the investigator can take a rather directional approach to inquiry (Sullivan & Spilka, 2010) and gain insights not only into what is happening, but also why it is happening in order to understand perceptions, attitudes, and reasoning behind actions (Davy & Valecillos, 2010).

Throughout my study, I followed the guidelines from Patton (2002) who advises qualitative researchers to take a position in the middle of the participant-complete observer continuum and fully disclose the goals and processes of the study to participants. To address the concerns of construct validity, I clearly defined the topic of my study (quality in multilingual CM) in terms of concepts and related these concepts to the objectives of my study (examining the shifts in approaches to multilingual quality and the resulting changes in positions of technical communicators). Relying on previous research on CM, quality, multilingual TC, and technical translation, I then identified operational measures that matched my concepts.

I made every possible attempt to minimize the possibility of preconceptions in my study design and interpretation of results. Yin argues that studying a phenomenon in its raw form without preconceptions helps the researcher discover theory (Yin, 2002). Although I was initially guided by the combination of activity theory and genre ecology framework, I took extra care to remain open throughout my study to new possible approaches to explaining the complexities of multilingual quality in CM and the roles of technical communicators in this quality.

As part of my case study approach, it was paramount to me to provide usable feedback to the participants and through negotiation help them re-envision their quality practices. During my case study I engaged my participants in setting the agenda and boundaries for the project by asking them to point out stakeholders who they saw as important quality assurance agents; after my study, I wrote a comprehensive report for the international unit. Such an approach is supported by TC literature; e.g., Andersen (2011) argues for reciprocity as a methodology for researcher-participant interaction, while Tebeaux (2003) advocates engaged university, and Faber (2002), action research. One key goal of this type of research, according to these three authors, is to change TC practice through research and direct application of research findings to workplace contexts and in that way help bridge the divide between academia and industry. Blakeslee, Cole, Conefrey (2010) argue that the validity of a qualitative study should first and foremost be measured by the way it brings improvements to TC practice while meeting the needs of academic researchers at the same time. By relying on the principle of reciprocity, I also strove to increase the practical validity of my study.

METHODS FOR COLLECTING DATA

Yin (2009) explains that in case studies a researcher needs to implement multiple sources of evidence in order "to address a broader range of historical, attitudinal, and behavioral issues" (p. 99). While Yin includes six sources that can provide evidence for case studies (documents, archival records, interviews, direct observation, participant-observation, and physical artifacts), he also notes that the objective of collecting actual events and behavior can be complemented by data about attitudes and perceptions usually collected through surveys and questionnaires. I aimed to analyze the technical, political, social, and rhetorical dynamics of multilingual CM, but I was in a position of an outsider (even though I managed to establish good relationships with all study participants), so I needed to collect data from as many sources available to me as possible. In addition, diversifying methods for collecting data and sources of data helped me achieve *methodological triangulation*—one way of strengthening integrity and guarding against researcher bias (Denzin, 1978; Porter, 2002; Sullivan & Spilka, 2010; Yin, 2009). Including multiple methods for collecting data and adjusting methods for collecting data based on the input from participants not only allowed me to compensate for weaknesses of each method, but also provided participants more flexibility if they could not use a certain method. I was also planning to be minimally intrusive and change my location often, so the combination of data collection methods allowed me to constantly be in touch with participants, even though I could be located in just one unit of the company at any given time (e.g., I sent emails about me and my project, I asked participants questions via email before I met them, I continued conversations through email while I was in a different location within

the company). The combination of the following methods of data collection contributed to ensuring a sound methodological design.

- *Observations*

I conducted observations to focus on how participants interacted with one another, how they interacted with CM technology, and what types of interactions they had about technology and multilingual quality. This approach allowed me to trace the mediation activity of the new genre (chunks of content) that emerged after the implementation of CM and to map out the contradictions this new genre brought to the multilingual quality understandings and practices.

This method of data collection consisted of observing a presentation and "snap shot" job shadowing (including meetings). On my first day at the study site, I was given a presentation about the work practices of multilingual CM and the benefits of adopting a CM technology by two TC stakeholders of the international unit. This formal presentation and a subsequent informal conversation helped me gain insight into how these two employees represented the specifics of their work to an outsider and how they constructed their understanding of CM strategies and technologies.

I also conducted "snap-shot" observations of everyday tasks of the three TC stakeholders in the international unit. I call my job shadowing approach "snap shot" because I had to move constantly to different units of the company to work with my large group of participants; I conducted observations in the international unit on random days or days that were outlined by the participants as important. I would observe regular work days at the international unit, then move on to the marketing

department, move back to the international unit, move to a product-specific unit, and so on. However, most of my observations happened in the international unit, since it was at the center of my study. During all my observations I tried not to interfere with the natural workflows; although participants noticed my presence, they didn't seem to alter how they proceeded with their everyday business.

I took detailed and concrete field notes during my observations, which I categorized into three sections: observational notes (what I was seeing), theoretical notes (my interpretations of what I was seeing), and methodological notes (any concerns or thoughts related to my methods). After every observation, I re-read my notes and combined my theoretical and methodological notes, together with any additional insights, into research memos. At a later stage of the study these memos became a separate source of analysis.

This approach to observations allowed me to be minimally intrusive and include participants in setting agendas for my study—it therefore made my study both intensive and extensive. In addition, this approach helped me to overcome the problems associated with gaining access to the study site. Access to study site can be "a continuous issue when the researcher moves around in various settings within an organization" (Marshall & Rossman, 2006, p. 74).

- *Interviews*

Combined with observations, interviews enabled me "to understand the meanings that everyday activities hold for people" (Marshall & Rossman, 2006, p. 102). All participants took part in two individual in-depth interviews (one formal interview at

the beginning of the research and one semi-formal interview after I completed the first round of interviews for all participants). My interviews had several pre-structured questions but were open-ended, covering retrospective accounts of multilingual quality practices, current approaches, and hopes for future developments; each interview lasted between 1-1.5 hours. The main purpose of the first round of interviews was to create an initial picture of multilingual quality understandings and approaches at DreamMedi; the main purpose of the second round of interviews was to check what I thought I was observing and learn more about participants' attitudes and perceptions of the main issues under study by returning to the initial storylines of the multilingual quality stakeholders and reconsidering them. Thanks to the two rounds of interviews I was able to create a multivocal and fuller perspective of multilingual quality approaches.

When planning the interviews, I was guided by the description of in-depth interviews by Kahn and Cannell (1957) who define an interview as "a conversation with a purpose" (p. 149). That is why I structured my interviews around my three research questions but remained flexible to the participants' ways of framing their responses. In such a way I could get a deeper insight into participants' everyday work, with its problems and contradictions; that is, I was able to find out about the types of issues I might not have been able to anticipate. In addition, all participants had different roles and backgrounds, so I had to modify my questions to fit their particular context. For example, my question "How long have you been with DreamMedi and what is your role at DreamMedi?" led Rose to explain how she had been hired for a temporary three-month job but then offered a permanent position; her story, in return, led me to

ask the following question: “What do you think made DreamMedi reconsider your position?” Rose’s answer provided a picture of her perceptions of valuable TC competencies when she was first hired and after CM-Master was introduced.

My questions, however, always focused on each participant’s perceptions of the quality in multilingual technical texts, the software they used to create these texts, and their own and others’ roles within the company. On several occasions, interviews led to participants showing me certain processes they were following to accomplish certain tasks and pointing out what they felt worked well/not well in the software, the work processes, and texts. The TC stakeholders in the international unit walked me through their daily tasks with the CM software, the desktop sales system, and the online sales system. They explained their understanding of the functionality of the technology for multilingual texts. One of these TC stakeholders also took the time to show me training available from the CM software developer. Three participants outside of the international unit took the initiative and suggested looking at the documents in Spanish and Chinese; their goal was to explain what made these documents good and what could be improved. I always was open to participants showing me what they considered important; this open-mindedness allowed me gather data that, in turn, helped me create a picture of the concerns of the participants.

I interviewed employees located in geographic proximity in person in conference rooms available at their facilities; one person at a local facility requested a phone interview instead for reasons he chose not to explain. I interviewed participants located outside of the US over Skype or substituted an interview with a series of

written questionnaires for the reasons I describe in the Ethics in Research Design and Reporting section of this chapter. With permission of participants, I recorded all interviews. Using a digital voice recorder enabled me to focus on the interaction and forego taking notes during the interviews. The digital voice recorder worked well for both in-person and Skype interviews. I transcribed all interviews for easier coding.

- *Questionnaires*

During data collection I used several types of questionnaires. I always sent out brief pre-interview questionnaires as probes; responses to those helped me compose my interview questions. Participants answered these questionnaires in writing in a Word document and emailed them back to me several days before the interviews. For example, the shifts in job titles of some participants during the time they spent with DreamMedi provided interesting insights into the ways participants perceived their competencies, roles, and tasks and allowed me to word my questions about multilingual quality practices better for their particular contexts. After each interview, I sent all participants a follow-up questionnaire, the goal of which was to get their evaluation of my understanding of the situation. In addition, a final questionnaire was used for all participants at the closing of the study.

For several participants, I had to use an extended questionnaire sent via email in place of an in-depth interview for reasons I explain in "Issues of Qualitative Research in Multilingual/Multicultural Settings" section. This approach was somewhat problematic, since without the personal interaction I had to rely "on the honesty and accuracy of the participants' responses" (Marshall & Rossman, 2006,

125), and I wasn't able to adjust questions based on the previous answers. To overcome this problem, I used open-ended questions that required reflection by the participants and included a section that asked the participants to share any additional information that they deemed important based on previous questions (see Appendix A). These questionnaires allowed me to collect data on the occasions when other methods did not work and obtain a multi-faceted set of evidence, and my participants could work on my questions on a flexible schedule, without having to find hour-long periods of time in their extremely busy schedules to devote to extended interviews.

- *Document collection and content analysis*

Marshall and Rossman (2006) state that "knowledge of the history and context surrounding a specific setting comes, in part, from reviewing documents" (p. 107); in addition, content analysis is an unobtrusive method for gathering evidence and, hence, an excellent approach for a researcher who is an outside observer. That is why I supplemented my other methods of collecting data with gathering and analyzing documents produced by and for the study participants. I collected these documents during my visits and through email; I downloaded them from the website; I had access to passwords to work with the online sales system to get insights into how information is assembled in it (due to issues of confidentiality I was not able to use any text from the online sales system for later coding). All these documents were a tremendous help in designing my interviews and questionnaires, and they also allowed me to "corroborate and augment evidence from other sources" (Yin, 2009, p. 103).

- *Software exploration*

  Since I was not participating in the work of the company and I was not familiar with specifics of CM-Master software but I still needed to get more knowledge of the issues TC stakeholders were experiencing with the CM approaches and software, I added another element to my data collection: I received permission to explore the CM software on several occasions. First, I had two guided tours of the software by the international unit. Then I navigated the software myself. I have taken detailed notes of the structure and functionalities of the software.

To show that the results of a qualitative study are reliable, the research needs to clearly demonstrate that all procedures can be repeated with the same results (Yin, 2009). One of the ways to strengthen the reliability of a qualitative study, according to Yin, is incorporating a case study database. During data collection I developed such a database, in which all evidence was stored in five folders: observation notes, interview questions and transcripts, questionnaire questions and answers, analytical memos (including memos about software exploration), and documents and content analysis notes. I divided each folder into two subfolders: one for uncoded data and one for coded data. I then marked observational notes by date and occasion (e.g., observing a meeting or a presentation, job shadowing). I divided interviews and questionnaires by participant and date, analytical memos by the phenomenon of analysis (e.g., software), and documents by document type. The transparency of my case study database contributed to the reliability of my data analysis.

Overall, interviews, questionnaires, observations, protocol analysis, content analysis, and software exploration were the optimal combination of methods that allowed me to answer my research questions. A combination of these methods for data collection provided me with retrospective accounts of participants who were multilingual quality stakeholders before and after CM adoption and experienced the changes in technical translation first hand. They also let me gain insights into specifics of multilingual quality practices in different levels: text creation in English within the international unit, text translation by technical translators, text localization by bilingual reviewers, multilingual CM within the international unit.

I started analyzing my data already during initial stages of data collection and, as a result, was able to adjust my data collection based on the new understanding I was gaining. Specifically, this early analysis helped me further develop my theoretical framework for analyzing multilingual quality and CM and allowed me to inform my data collection methods by this framework.

Data Analysis and Interpretation

The way I approached data coding was influenced by the theoretical framework, my research questions, the importance of the voices of the participants, and the methods for data collection. In turn, my theoretical framework changed as I was collecting, coding, and analyzing data. Thus, collection, coding, analysis, and interpretation of my data were constantly interrelated and informed one another. In this section I first discuss my approaches to coding and analyzing data and then overview the theoretical framework that I developed to interpret the results of this analysis. This framework consists of

theories that explore (co)-mediation of writing activity by human beings, technology, and textual genres and help understand the differences in approaches to multilingual quality.

Coding and Analyzing Data

My data coding and analysis was an iterative process that started at the evidence gathering stage. As I was still collecting my data, I started transcribing interviews and identifying patterns and categories in all my data that developed from these patterns. I also focused on uncovering meaningful relationships that created valuable insights into multilingual CM practices and helped me continuously develop my data collection methods and theoretical foundations of the study. My goal was to "attend to all the evidence, display and present the evidence separate from any interpretation, and show adequate concern for exploring alternative interpretations" (Yin, 2009, p. 109). In addition, I dedicated two months to reviewing all my data after my study was complete to ensure that I accounted for all possible explanations of my data and for all possible answers to my research questions.

Because it is extremely important to keep in mind that data in qualitative studies is not just coded, it is rather *coded and recoded*, Saldana (2009) suggests thinking of coding data cycles. During the first cycle, I produced initial codes which were direct interpretations of my data. During the second cycle I classified, prioritized, integrated, synthesized, and conceptualized my initial codes into major patterns and then themes.

Since the focus of my study was on contradictions in multilingual quality practices (a focus strengthened by the insights from the genre ecology framework and activity theory as part of my theoretical framework), I determined before the study that versus and

descriptive codes would be the best way to address these issues. Combining versus, descriptive, and in vivo coding methods during the initial cycle allowed me to let data speak for itself when revealing patterns and categories but also helped me to stay focused on identifying relevant information.

- *Versus codes*

  Versus codes "identify in binary terms the individuals, groups, social systems, organization, phenomena, processes, concepts, etc. in direct conflict with each other" and use these binary terms to reflect "an asymmetrical power balance" (Saldana, 2009, p. 94). Versus codes were particularly eye-opening for my study since they suggest conflicts within, among, and between participants, especially because they can be an important diagnostic in initiating and facilitating change.

- *Descriptive codes*

  Descriptive codes summarize in a short phrase or a noun "the basic topic of a passage of qualitative data" (Saldana, 2009, p. 70); these topics do not abbreviate the content but rather describe it (Tesch, 1990). Descriptive codes are especially useful for my study due to the variety of data forms I had, such as interview transcripts, observations notes, document, etc.

- *In vivo codes*

  Since my study was exploratory, I was very careful not to create pre-conceived ideas of the results. To avoid any pre-conceptions, I incorporated in vivo coding. An in vivo code "refers to a word or short phrase from the actual language found in the

> qualitative data record" (Saldana, 2009, p. 74) or "the terms used by [participants] themselves" (Strauss, 1987, p. 33). In vivo coding is particularly suited for studies that value and prioritize participants' voices and opinions. While in vivo coding can be challenging, because it might not offer immediate connections with the research questions, in my case study it helped develop my theoretical framework. While I originally was relying on genre ecology framework and activity theory as the two main lenses for analysis, I soon realized that these theories lack the language to account for contradictions between the desired and real quality practices of technical translators and to examine leadership opportunities in multilingual quality management on an individual level. As a result, I extended my theoretical framework to include Skopos theory and actor-network theory, as these two theories provided valuable insights into the contradictory multilingual quality practices and the interdependent roles of technical communicators and their quality practices.

After the initial coding of all data I recoded it again to create more precise wordings; I merged some codes due to their conceptual similarity, analyzed infrequent codes for their usefulness, and dropped the ones that were marginal or redundant (Lewis & Silver, 2007). I then proceeded to the second cycle coding "to develop a sense of categorical, thematic, conceptual and/or theoretical organization" of my codes (Saldana, 2009, p. 145).

During second cycle coding I implemented pattern coding and axial coding methods. Pattern codes are "explanatory or inferential codes, ones that identify an emergent theme, configuration, or explanation. They pull together a lot of material into a more meaningful and parsimonious unit of analysis" (Miles & Huberman, 1994, p. 69). Pattern coding was

particularly useful for examining social networks and patterns in human behavior and for establishing rules and causes in the data. To complement pattern coding, axial coding allowed me to strategically reassemble data that was split during initial coding.

Saldana suggests that this mixed approach to coding—where several coding methods are used to make new discoveries, insights, and connections based on the study questions and goals—is bound to "capture the complex processes or phenomena" (p. 47) better than a single method approach. The mixed method approach also helped me strengthen the internal validity of my study, "seeking to establish a causal relationship, whereby certain conditions are believed to lead to other conditions, as distinguished from spurious relationships" (Yin, 2009, p. 40), since I employed pattern matching and addressed rival explanations during data analysis. In addition, the coding methods I selected allowed me to cover the broad range of methods of collecting data and types of data collected.

During the coding of my data, several themes and models emerged. Inconsistent and often contradictory understandings of multilingual quality (e.g., translation versus localization) are not communicated between the quality stakeholders—a situation that is exacerbated by the implementation of a CMS and the introduction of a new genre, chunks of content. As a result, there is a constant tension between the needs and capabilities in the multilingual TC (e.g., technical translators' needs, such as the knowledge of Skopos, versus genre ecology capabilities). These tensions led to many failed connections between the stakeholders of multilingual quality, devaluation of the expertise of TC stakeholders, and a decrease in the overall multilingual quality potential for this particular workplace. Identifying the themes, in return, helped me transition into modeling and

interpreting my data through the lens of the genre ecology framework, activity theory, actor-network theory, and Skopos theory and to answer my research questions.

Theoretical Framework

As Hart-Davidson et al. (2007) suggested, we should see CM as ‘‘a way of constructing new types of relationships between and among actors and resources within organizations and stakeholders outside them’’ (p. 14). The theoretical framework I chose for this study of multilingual quality and CM in organizational contexts provided analytical tools for examining the impact of these new relations on the understandings and practices of multilingual quality within workplace contexts. First, it helped me create an analysis of how multilingual quality is structured in a particular organization that relies on CM technology for multilingual TC. Second, it helped me draw a scheme of multiple differing quality priorities of the stakeholders, a powerful analytic mechanism for making these priorities transparent, which is, I argue, a step toward productive quality improvement discussions. Third, it led to my outlining strategies for technical communicators to guide these discussions—to become multilingual quality managers and global information development leaders in workplaces that are transitioning to CM paradigm for global TC.

The theoretical framework I used for interpreting the results of my study and constructing models for theorizing multilingual quality and CM consisted of a productive dialogue between Activity Theory (AT), Actor-Network Theory (ANT), genre ecology framework (GEF), and Skopos theory. In this framework genre works as a uniting and overarching concept. It unifies genres within genre ecologies, creates contradictions within activity

systems, dominates political-rhetorical alliances and work process negotiations in actor-networks, and challenges the rules for defining Skopos as a way of achieving multilingual quality. In what follows I provide an overview of the GEF, AT, ANT, and Skopos theory, knitting these theories together with the genre thread and explaining how each theory helped me develop the best possible understanding of my findings.

Genres and Genre Ecology Framework

The most common definitions of a genre describe it as a rhetorical action that is typified, socially recognized, based on recurrent situations, and "used by organizational members for particular communicative and collaborative purposes" (Miller 1984, p. 159; Yates and Orlikowski, 1992) or a multidimensional tool (Paré and Smart, 1994; Hart-Davidson et al., year; Bazerman, 1988; Swales, 1990). For this study of multilingual quality and CM, the concept of genres provided an analytical lens for examining chunks of content as mediators of multilingual TC and as units of analysis.

Spinuzzi (2002) argues that to characterize a phenomenon as a genre, this phenomenon needs to "provide a relatively stable, easily interpreted way of addressing or mediating recurrent situations." I adopted Spinuzzi's outline to explain how chunks of content can function as genres by providing "rich interpretive cues" that allow workers to

- structure other genres (assemblies of chunks of content create other genres);
- separate different types of genres (these assemblies are different for different genres);
- keep a writer's place in a complex task and signal progress in a complex task (verifying technical accuracy of information; creating, reviewing, editing chunks

of content; assembling chunks; sending new chunks for translation; assembling translations);

- mediate a task (e.g., translators working against their best practices, experience, and educational background); and
- mediate relations (e.g., translators complaining and stopping to complain about the change in work practices).

I used this outline of characteristics of chunks of content as genres in Chapter 3 to arrive to what McCarthy et al. (2011) call "a broader understanding of the writing system as an intermediated series of typified responses to stimuli recurring within the complex social context of the workplace" (p. 373) in their study of CM. Honkaranta (2003) also argued for the usefulness of the genre lens for researching CM—for examining content in organizations even when this content is not considered a document. For this study of multilingual, CM viewing chunks of content as a genre allowed illuminating the shifts in the understandings and practices of multilingual quality that happen when approaches to writing change after the adoption of a CM technology. Chunks here mediate writing and translation practices, create tensions and contradictions, and impact changes in this workplace and the positions of writers within the organization.

Genres, however, do not function independently; they rather interrelate with each other in intricate, interweaving webs (Freedman & Smart, 1997). In these webs, genres can be connected and used in various ways depending on the exigencies in the communication situations. These genres form opportunistic connections that are then cemented through practice; yet these genre webs are dynamic and import new genres and evolve to meet

new contingencies. Spinuzzi and Zachry (2000) call these webs of genres genre ecologies.

The metaphor of an ecology as a lens for examining the complexities of TC is not new; it has been a focus of describing the symbioses of readers, users, technologies, and information environments. For example, Nardi and O'Day (1999) use the metaphor of information ecologies to describe "the strong interrelationships among the social, economic, and political contexts in which technology is invented and used" (p. 47). Hutchins and Lintern (1995) examine how users conduct their work with technology in "tool ecologies." Rijken and Mulder (1996) look at "e-cologies" and Internet "ecosystems" to study the complexities of Internet communication.

The idea of genre ecology, however, has been more recently coined to focus on the concerns of technical communicators—people who develop documentation and create technical texts (Freedman & Smart, 1997; Spinuzzi, 2002; Spinuzzi & Zachry, 2000). According to Spinuzzi and Zachry, genre ecologies include "an interrelated group of genres (artifact types and the interpretive habits that have developed around them) used to jointly mediate the activities that allow people to accomplish complex objectives" (p. 172). In these ecologies, several genres co-exist as individuals work on their activities with information technologies (Spinuzzi, 1999; Zachry, 1999; Freedman and Smart, 1997). This framework accounts for the dynamism and interconnectedness of genres.

For studying quality in multilingual CM, the genre ecology framework provides tools for mapping the genres used in a particular workplace, describing changes with the advent of new genres, identifying the mediatory relationships between genres and stakeholders, and

analyzing social and political implications of new relatively stable contingencies. In particular, it allows

- *Exploring social and political formations and motives within TC workplaces*

  Since genres are typified and their contexts are recurrent, researchers can examine the observable social, physical, and linguistic features of communication that contribute to the substance of genres (e.g., Yates and Orlikowski, 1992). Genres arguably shape the knowledge that individuals create and exchange (Kain, 2005), thus enabling us to analyze relations between genres and their uses. Since genres grow from technical, social, and organizational contexts (Erickson, 2000) and genres often shape workplace practices (e.g., Paré and Smart, 1994; Paré, 2002), the genre lens creates an approach for considering the shifts of power of writers within workplace contexts.

- *Examining organizational change*

  The genre lens calls into question the stability of writing practices by focusing on how communities negotiate genres and use them differently for their own goals. It also helps connect the changes in genre use with their effects on organizational change and on change in global TC. In this study of quality in multilingual CM, the genre lens helps us consider how multilingual quality stakeholders restructure their quality practices around the new technology and the new genre.

While genre and genre ecology frameworks work with words as a way of "doing things" (Austin, 1962), they are most beneficial for the study of multilingual quality and CM in a workplace context in connection with AT, which focuses on doing things with any "kind

of semiotic or otherwise culturally constructed tools" (Artemeva & Freedman, 2001, p. 169).

Activity Theory

AT is a global multidisciplinary research approach (Engeström, 2000) to understanding human activity especially if it involves technology (Nardi, 1996). The main aim of AT is to understand humans and their social entities in their everyday life contexts by focusing on the genesis, structure, and processes of their activities; these activities are their purposeful interactions with the world, in which they perform as subjects (Leontiev, 1978). The subjects engage in their everyday activities towards a certain object, and in the course of activities mutual transformations between the poles of "subject-object" are accomplished. Both subjects and objects are characterized by agency—"the ability to act in the sense of producing effects." Subjects and objects interact and influence each other through this interaction (Nardi & Kaptelinin, 2006).

Engeström (1987), perhaps one of the most notable AT scholars, expanded AT to analyze continuous human activity as a heuristic for interrogating interactions of people and tools over time. According to Engeström's view of AT, human behavior is social, their activity is collective and mediated by tools, and human consciousness develops out of joint activities and shared tools (Cole, 1996). In the expanded version of the activity system triangle—a triadic structure of human activity —by Engeström (see Figure 8) the "goal-directed, historically situated, cooperative human interactions" (Russell, 1995, p. 53) are mediated through three different types of mediators: tools, rules, and division of labor. In this activity system, individuals or groups of individuals use mediating artifacts, physical

or psychological means, to transform a particular object; e.g., technical translators transform content in English into good-quality content in Spanish and Simplified Chinese.

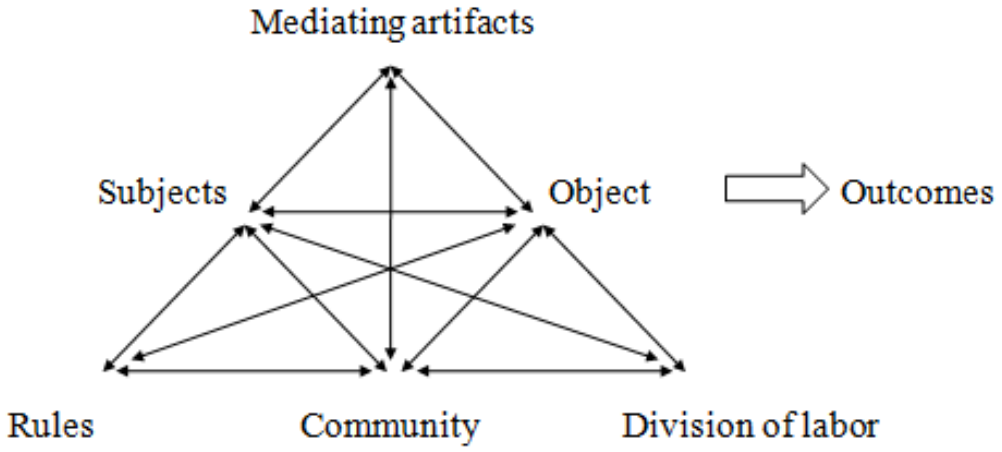

Figure 8: Expanded Model of an Activity System by Engeström

Subjects participate in their activity because they have a certain outcome in mind: e.g., technical translators strive to create good-quality content in foreign languages because they want to continue their business with DreamMedi. They are mediating their activity through artifacts (e.g., CAT software) and rules—inherently complete guides for action or activity prescribed, often tacitly, by the community (e.g., working on the text according to their knowledge, training, and experience). Subjects' mediated activities are rooted in their communities (independent aggregates of individuals who share sets of social meanings) and relate to the object through the division of labor (Engeström, 1987). Genres and genre ecologies can fulfill multiple roles in activity systems. While routinized

and socially accepted genres can function as operations in activity systems, they also can become mediating artifacts and objects (Artemeva & Freedman, 2001).

When an activity system comes into being with the aim of a particular object and it happens so that this object cannot be achieved in this exact activity system, a need state comes into existence. These need states are inevitable (Holt & Morris, 1993) because activity systems are dynamic constructs. As a result, contradictions in activity systems become inevitable as well. "Contradictions are historically accumulating structural tensions within and between activity systems" (Engeström, 2001, p. 137). They are essential to the developmental change that is the basis of AT (Spinuzzi, 2005); they allow AT to become a valuable tool in analyzing "the role of different types of professional communication in serving as sites where contradictions can be brought to visibility and resolution" (Artemeva & Freedman, p. 165).

In activity systems, the motive for change efforts arises when contradictions within their nodes are analyzed and possibilities for a new form of the object are projected as an expansive solution for these contradictions (Engeström, 1999). Engeström called this projection "a zone of proximal development for the collective activity" (p. 66). While the goal of each activity system has a fixed end state, the zone of proximal development is "the area between the present and foreseeable future" (p. 66) or "the distance between the present everyday actions of the individuals and the historically new form of the societal activity that can be collectively generated as a solution to the double bind potentially embedded in the everyday actions" (Engeström, 1987, p. 174). Engeström (1999) argues that if this zone is not established, "specific goals are built on sand, or pinned onto thin air" (p. 66).

AT had important implications for my study of multilingual quality and CM in a workplace context. AT allowed me to separate the practices of multilingual TC by its nodes (subjects, objects, mediating artifacts, rules, community, division of labor, outcomes) and then elucidate the contradictions within these and between these nodes of the multilingual TC activity system. AT also helped me examine an activity system of multilingual TC where subjects have a common object of activity (multilingual quality) as a unit of analysis. Within this activity system, I could then analyze interconnections of the components of an activity, for instance, mediation of relations between participants and the communities to which they belong by artifacts, rules, and division of labor. Moreover, AT provided a sophisticated set of theoretical and methodological tools to study change, development, and interaction "performed through the cyclical resolution of dialectical contradictions" (Spinuzzi, 2008, p. 80). The combination of genre/genre ecology frameworks and AT allowed explanations of change. GEF helped explain how genres and genre ecologies evolve in response to change, or influence change, or create tension themselves, while AT "provides a higher level of theorization to account for change as well as resistance and conflict" (Artemeva & Freedman, 2001; also c.f. Russell, 1995). The points of instability, contradiction, and tension, for me, functioned as excellent points of entry for researchers (Spinuzzi, 2008).

Skopos Theory

Skopos, developed by Vermeer, arose from functionalist translation theory. Functionalism departed from the conventional source-text oriented views of translation to include some aspects of the target texts, but did not account for the situations when functions of a source text and a target text differ. Skopos theory recognizes that sameness

of function in the source and the target text is not always practical or desirable (e.g., the function of an article may be to entertain and educate in one language and to educate and provoke in a different language).

According to the *Skopos rule* of the theory, translators must always keep in mind the Skopos, or the function of the text, while translating: they must "translate/ interpret/ speak/ write in a way that enables your text/ translation to function in the situation in which it is used and with the people who want to use it and precisely in the way they want it to function" (Vermeer, 1989, p. 20, quoted and translated by Nord, 1997, p. 29). The *coherence rule* of the Skopos theory postulates that after the Skopos rule has been fulfilled, any target text should be sufficiently coherent in order for the reader to comprehend it (Nord, 1997)—a translation must be coherent within the reader's situation (Reiss and Vermeer 1984) and take into account the reader's context and background knowledge, thus becoming a part of the reader's world continuum (Vermeer 1978). The coherence rule also implies that translators need to conform to the expectations and ethics in the target language and culture. The *fidelity rule* prescribes translators to create at least some coherence between the information in the source text and the interpretation of this information in the target text once the overriding rule of Skopos and the rule of coherence are fulfilled (Nord, 1997). The *loyalty rule* then puts emphasis on the relationship between the translator, the source-text creator, the target-text readers, and the client (Nord, 2001) and suggests that even when there are significant differences between the source and target texts, the translation should meet needs of key stakeholders (Nord, 1997).

According to Vermeer (1978), the Skopos of the target text is determined by the client (the person who initiates the translation process) and the translator based on their situational and cultural backgrounds. The theory does not prescribe translation principles, but rather encourages one to decide on the Skopos of translation in each specific case (Vermeer, 1989)—the Skopos must be decided separately in each specific translation project (Schäffner). Skopos theory allows for different translations of the same text, providing the flexibility technical translation requires because functional changes in technical texts are quite commonplace and normal (Byrne, 2007).

Skopos theory reflects "the professional and practical reality of translation because it focuses on the intended purpose of the target text and its audience who are, arguably, the most important people in the translation process" (Byrne, 2007). It is also pedagogically invaluable as a prescriptive theory and is the most common theory for training technical translators. However, some argue that Skopos theory in practical terms "relies on an optimal set of working conditions with optimally competent translators," while in the real translation work there is "the prevalence of poor translations, coupled with poor working conditions and low pay" (Chesterman, 2010, pp. 224-225).

Incorporating the Skopos theory lens into my study helped me position technical translation quality within multilingual TC at DreamMedi. It helped bring into focus the tensions between ideal quality practices and the reality of multilingual CM strategies and technologies, shed some light on the challenges that technical translators face, and emphasize the importance of negotiating quality and creating shared awareness of quality approaches. Skopos theory brings invaluable insights from technical translation theory,

pedagogy, and practice, since it is the most applicable translation theory that provides a theoretical framework for talking about localization and quality in *technical* translation.

Actor-Network Theory

Actor-network theory (ANT), developed by Callon (1986a), Latour (1987), and Law (1987), provides theoretical and methodological tools for studying activities as a symmetrical phenomenon. According to Meyers, we need to start thinking of ANT with a flat terrain of actants, who are "powerless as long as they are not linked to each other" (Meyers, 1996, p. 10). These actants can be defined as collective or individual agents that serve as intermediaries between other actants (Uden & Francis, 2009); these actants are social, technical, conceptual, and textual (Law, 1992), with no difference between human and technical or the social and the natural (Murdoch, 1997). Latour (Johnson, 1988) stresses that humans and nonhumans are not sufficient by themselves; they need to "delegate" their tasks, which is why they need to form alliances to achieve their aims; he further argues that actants are defined through their connections to other actants.

All actants have their own goals, and, in order to achieve these goals, they enter into network associations and alliances that provide them with substance, action, intention, and subjectivity (Callon, 1986a). The core of entering into associations and alliances is the process of translation (Callon 1986b; Latour 1998). Successful translation creates rather coherent assemblages of actants that strive to accomplish the accumulated goals of the various actants. When this happens, the assemblage becomes an actant (Spinuzzi, 2008). When actants manage to translate the interests of others to one's own, they can align an actor-network leading to a certain degree of alignment of interests, acceptance, and stability.

Through the building of an actor network actants overcome the resistance of other actants by weaving them into their own network (Law, 1992). Spinuzzi (2008) argues that actor-networks constantly engage in political and rhetorical projects, since networks are constantly looking for ways to "strengthen its existing alliances and make new ones; actants are continually convincing their allies to support them in their aims and routing around traitorous actants with the help of other-allies" (p. 41). Actants become "powerful by making and maintaining links" with other actants and their networks (Meyers, 1996, p. 10); networks become stronger and more durable when more entities are enrolled in them (Spinuzzi, 2007).

ANT framework was useful for studying multilingual quality and CM because it allowed me to examine the roles of stakeholders through the political-rhetorical alliances they made within the actor-network of their workplace. The ANT lens also helped me investigate how some communicators use new genres and technologies as alliances for achieving multilingual quality in CM, while others see both as hindrances to their work practices. The more alliances they make with other actors (multilingual quality stakeholders, genres, CM technologies), the stronger and the more visible they become in the organization, hence the more influence they can have on the multilingual quality and global TC practices of their company.

Combination of Theoretical Lenses

Combining GEF, AT, ANT, and Skopos theory helped me strengthen external validity of my study through theoretical triangulation. Yin (2009) maintains that in contrast with statistical generalization offered by quantitative methods, qualitative research relies on

analytical generalization. The combination of these theories is, in turn, the way of analytical generalization of my findings, as it builds the theoretical framework that can provide the basis for other case studies of multilingual quality and CM in different workplace contexts.

The combination of these four theoretical lenses also provided a hybrid approach for analysis of complex (co)-mediation and shifts in quality practices and positions of technical communicators. The genre ecology framework presents a meso-level perspective of how "tactical rather than longer term strategic actions are foregrounded, particularly as those actions are mediated by tools" (Gygi & Zachry, 2010, p. 370). It allows focusing on chunks of content as unit of analysis and examining how the work practices of multilingual quality stakeholders are mediated by their relation to chunks of content as genres. For example, in Chapter 3 I discuss how a technical translator, David, stops communicating with localization advocates because his transition to working with chunks of content erases the incentives for such communication. The goal of Skopos theory in my analysis is to complement GEF and AT by insights from technical translation. Skopos theory helps analyze the struggles David experiences due to his understanding of how technical translation should be done based on his knowledge and experience and opposing approaches that he follows in reality after the emergence of chunks of content as genres. However, David's tactical decision based on his evaluation of costs and benefits, contradicts his strategic goal of keeping DreamMedi's business by creating good-quality translations. AT provided me with mechanisms for macro-level investigation of this and other contradictions in multilingual quality and global TC at DreamMedi and for forecasting how these contradictions could be brought to a successful

resolution. While AT allowed me to focus on the dynamic nature of multilingual quality in TC and to sketch strategies for multilingual quality negotiation by stakeholders, ANT provided a theoretical lens for micro-analysis of individual participants, in particular TC stakeholders, and for outlining leadership opportunities for technical communicators as multilingual quality managers.

The combination of these four theoretical lenses serves as a useful analytical tool for studying textually mediated knowledge work (Hart-Davidson, Spinuzzi, & Zachry, 2006; Zachry, Hart-Davidson, & Spinuzzi, 2008) and "considering texts as key markers of people and their activities rather than '''as ends in themselves''' (Bazerman, 2004, p. 319, cited in Gygy & Zachry, 2010). However, it also challenges the idea of multilingual texts as ends of writing activity that are out of control of technical communicators if they do not speak the respective languages. McCarthy et al. (2011) note that as technical writing researchers, we should "recognize that little attention has been paid to the documented effects of introducing technology into an existing workplace writing system;" the authors also call for more accounts of how workplace communities and technologies interact. With the help of my hybrid theoretical framework I create just such an account: not only did this framework allow me to gain insights into how an organization thought about writing with the advent of CM (c.f. Hart-Davidson et al., 2007), it helped me examine how their understanding of what it means to create texts for global audiences was impacted as well. If technical communicators want to become knowledge workers and leaders of information development, we need to move beyond the focus on monolingual audiences, monolingual texts, and monolingual technological contexts.

ETHICS IN RESEARCH DESIGN AND REPORTING

During all stages of my study, I was committed to ensuring ethical approaches to representing the participants and the phenomena I was observing. These approaches go far beyond diligent informed consent procedures and protecting anonymity of the participants. I relied on reflexivity (cf. Blakeslee, Cole, & Conefrey, 2010; Berg, 2004; Doheny-Farina, 1993; Herrington, 1993; Sullivan & Porter, 1997), participant inclusion into setting agendas and shaping interpretations (cf. Blakeslee, Cole, and Conefrey, 2010; Cross, 1994), and multivocal reporting (cf. Blakeslee, Cole, & Conefrey, 2010; Sullivan & Spilka) to make my research design and reporting ethical and fair. In addition, I adopted approaches from social and communication studies to address the complexities of multilingual/multicultural qualitative research.

Reflexivity

Doheny-Farina (1993) notes that since researchers have their own rhetorical agendas, perspectives, and biases, they shape qualitative research on writing in nonacademic settings. Blakeslee, Cole, and Conefrey (2010) argue for acknowledging and articulating our agendas, perspectives, and biases; the authors, however, also stress the importance of the values and agendas of the participants, since they impact their view of researchers, research processes, and their own work practices. Explicitly addressing these agendas, perspectives, and biases will help readers of the research findings understand and evaluate how the situatedness of the researcher and the participants, as well as the awareness and understanding by the researcher of this complex situatedness, influenced the qualitative inquiry. This awareness and understanding—reflexivity—bring to light any "intrusions, doubts, and mistakes that characterize any research activity" (Sullivan &

Porter, 1997, p. 69) to show that all researchers are active participants of the contexts they are examining (Berg). At the same time, several authors (e.g., Doheny-Farina, 1993; Geertz, 1973) caution that when researchers make reflexivity their sole purpose, it can distract them from the questions they are studying; Doheny-Farina (1993) rather argues for a systematical and perceptive inquiry. In making my study design and reporting reflexive, I was guided by the questions that Blakeslee, Cole, and Conefrey (2010, p. 43) adapted from Herrington (1993):

- Whose views are included in the research and who represents them?
- What roles do participants play throughout our studies?
- How do researchers recognize and/or address their own roles and the influence of those roles in shaping their findings?
- How do researchers recognize and/or acknowledge the functions of their ideologies and values in their studies?
- How do researchers recognize and/or address their participants' roles and the influence of those roles in shaping their findings?
- How do researchers recognize and/or acknowledge the functions of their participants' ideologies and values in their studies?

During my study I had to constantly be acutely aware of my own background in translation studies and technical translation, as well as my experiences of working with chunks of content as a freelance translator. My situatedness not just in TC but also in technical translation had the risk of turning my perceptions of some multilingual CM practices excessively negative (i.e., "sending chunks of content for translation is always a

bad practice"). To counter this risk, I was careful to repeatedly ask questions about reasons for quality practices and CM practices to all of the participants to see what kind of patterns arise from their answers. However, I was also aware that my situatedness could influence even the kinds of questions I was asking, so I kept my questions open-ended, thus letting participants shape the agenda while guiding them to stay on the topics of my interest. In addition, I was cognizant of the participants' situatedness as well (e.g., a person who took an active part in choosing the CM software and developing multilingual practices may feel threatened by any view that could compromise the validity of his/her choice). Including multiple participants with various roles within the company and asking them similar questions allowed me to gain a clearer picture through the multitude of perspectives.

Participant Inclusion into Setting Agendas and Shaping Interpretations

Cross (1994) argues that a valid research account represents a balance of inferences of all research stakeholders and integral parts: participants, the research community, the data, and the researcher. Similarly, Blakeslee, Cole, and Conefrey (2010) note that "by engaging participants in judgments about the quality and usefulness of our work" we can make validity a shared notion. Here are the strategies I followed to include participants' views into the study:

- *Inviting participants to set agendas.* I always let participants introduce me to the employees of the study site whom they perceived as important quality stakeholders.

- *Inviting participants to review interpretations*. I continuously invited participants to give me feedback on my inferences through asking them to comment on my storylines and including statements such as "This is how I understood it. Is that correct?" into my interviews and oral and written communications.
- *Making findings relevant to both me as a researcher and to the participants*. My research project answered my research questions and provided questions for my future research. At the same time, it helped participants improve communication paths for establishing a contextualized understanding of quality in multilingual CM.

Multivocal Reporting

In delivering my findings, I follow Blakeslee, Cole, and Conefrey's (2010) advocacy for multivocal reporting—seeking and acknowledging "the interpretive stances" (p. 33) of the participants. Even when these stances are discrepant and contradictory, the authors argue that these are productive occasions for research. Relying on the thick description as a strategy, I strove to represent participants' presence and their contributions to my inquiry. In many cases, I was weaving my participants into my account of multilingual CM through direct quotations (e.g., including comments from various people to corroborate my points) and by attending to all collected evidence and all possible explanations.

Issues of Qualitative Research in Multilingual/Multicultural Settings

In addition to the traditional issues of validity and integrity in qualitative research design, I needed to address some unique questions connected to the multilingual and

multicultural nature of my case study. Multilingual/multicultural qualitative research presents a set of challenges, since it requires adapting "essentially Western research designs to accommodate different cross-cultural styles of facilitation, group dynamics, spatial arrangements, gender issues, protocol, patterns of participation, and perception of time" (Laverack & Brown, 2003). There is surprisingly little codified knowledge in TC that could provide guidance on strengthening validity of qualitative research in multilingual and multicultural contexts. Thatcher (2001) acknowledges that current qualitative research methods "are not designed to assess second-language and cross-cultural assumptions, variables that move far beyond a US multiculturalism. Furthermore, these methods seem derived from and designed for predominant US cultural and rhetorical values, especially those associated with US equality and individualism" (pp. 458-459). Thatcher specifically focuses on the issues of constructing interpersonal relationships and notes that design issues of researcher involvement need to be considered from a cross-cultural standpoint. For example, in a low-power-distance model (e.g., US) participants might feel more comfortable when participation is democratic and when barriers between the researcher and participant are broken; in a high-power-distance model (e.g., China), on the contrary, participants might feel more comfortable when lines of authority are clear and when the structures of the situation are outlined (Trompenaars, 1994). Thus, Thatcher notes that valorizing the concept of equality might often be a way of Americanizing research participants, and relying on a participant-centered research in study design can then be relying on US American values and, thus, can produce invalid results. Thatcher suggests a more balanced approach in which a researcher acquaints herself with the target culture, does not presume low power-distance

participation, and in ethical and sensitive ways relies on the clues from participants in crucial moments.

While taking into account Thatcher's discussion of relying on the clues from the participants in cross-cultural TC research, I also adapted some suggestions from social sciences and communication research in order to develop more specific strategies and provide the language for describing why and how I altered my methods for collecting and analyzing data. In what follows, I describe my approaches for addressing the questions of language and culture that I developed based on the descriptions of challenges in cross-cultural qualitative research by Aneas and Paz Sandin (2009). Note that while these two authors use a broad understanding of culture (e.g., through an examination, for example, of class and gender), I looked at their propositions from the perspective of conducting qualitative research across several countries.

At the beginning of my project, I paid special attention to the interpersonal intercultural relation climate, in particular to reducing anxiety (Berger & Calabrese, 1975; Gudykunst, 1993; Stephan, Stephan, and Gudykunst, 1999) and negotiating compromises with data collection strategies (Vila, 2005, translated and quoted by Aneas & Paz Sandin, 2009). Anxiety in multicultural communication is often generated by uncertainty of what's to come and the desire to predict attitudes, feelings, and behaviors (Stephan, Stephan, & Gudykunst, 1999). Such anxiety can negatively influence communicative relations, especially during interviews. To overcome the negative impacts of anxiety, I provided written descriptions of my study to all participants and offered to answer any questions before they made a decision to participate or not. I also offered them the opportunity to communicate with other study participants; several participants found this approach

helpful, because they could get reassurance about my study from other people within the company with whom they were in good relations and from their superiors who were also participating in the study.

Negotiating participant involvement and compromising on methods for collecting data were another important component of my strategy. It not only allowed me to reduce anxiety of the participants, but also ensured more engaged participation. I remained open throughout the study to suggestions from study participants on data collection methods. For example, several participants asked me to provide an outline of questions I was planning to ask during the interviews in advance; two participants from China asked if they could answer my interview questions in written form instead of a phone interview. Agreeing to their suggestions allowed me to address not only the issues of anxiety but also the issues of language in research process.

Issues of language had two direct implications for my study. First, one of the Chinese participants had informed me at a later stage that she felt much more comfortable with reading and writing English than with speaking and listening. Allowing her to read my questions and answer them in writing gave this participant the opportunity to concentrate on her answers instead of worrying about comprehension problems. As a result, this participant was more open in writing as her answers became more involved, more detailed, and more focused on her own work (rather than circling around what she seemed to perceive as best practices). Secondly, receiving answers in written form gave me as a researcher more opportunity to analyze the information in them without the risk of submitting to cultural and linguistic bias, as I could take the time to abstract my inferences from the ways the information was presented and constructed by the

participant who expressed concerns about her English-language proficiency before I composed my follow-up questions. Moreover, in their study of intercultural competence, Lustig and Koester (1996) have analyzed circular and linear styles of communication and came to the conclusion that often individuals with a circular style interpret those with a more lineal style of discourse as simplistic or arrogant, while the latter view individuals with a circular style as illogical or evasive. While Lustig and Koester describe extreme cases, in my experience addressing the challenges of language and communication styles was easier in written than in spoken language.

In addition, since researchers interpret and reason from their cultural points of reference, I continuously asked all my participants to give feedback on my findings, stating that if they can find any problems in my inferences, they should inform me, because this would be essential to the quality of my study. This approach helped me stay open-minded to unexpected findings. While I wasn't able to probe participants' opinions of me as a researcher and about the questions I was asking directly, I heard stakeholders on several occasions mention to other employees at the study site that they enjoyed working with me.

CHAPTER 3: SITUATING MULTILINGUAL QUALITY AND THE ROLES OF STAKEHOLDERS IN GLOBAL TECHNICAL COMMUNICATION WITH CONTENT MANAGEMENT

In this section I analyze multilingual quality at DreamMedi through the lens of the hybrid theoretical framework that allows me to address my research questions and to focus on the developing strategies for contextualized multiple-stakeholder approaches to multilingual quality.

Theory	Analytical Answers
Genre Ecology Framework (GEF)	How and why does adoption of CM challenge global TC practices?
Activity Theory (AT)	How do multilingual quality stakeholders (technical communicators and technical translators) approach quality of multilingual technical texts produced with CM? Why do they do it this way? What needs to change in approaches to multilingual quality to make it a contextualized multiple-stakeholder phenomenon?
Skopos Theory	Why do the approaches to multilingual quality change and differ? What do we need to take into account when considering contextualized multiple-stakeholder multilingual quality?
Actor-Network Theory (ANT)	How do the changes in multilingual TC brought by CM and the stakeholders' approaches to multilingual quality influence the roles of these stakeholders within workplace contexts? How can individual technical communicators become managers of multilingual quality and leaders in global information development?

Table 4: Theoretical Framework for Analyzing Multilingual Quality and Content Management

In my analysis I start with the GEF perspective because it provides an entry way to conceptualizing multilingual quality with CM as a genre mediated but also genre ecology bound concept. It also allows me to examine the tensions between quality understandings

and approaches by multilingual quality stakeholders. I then proceed to the examination of multilingual quality through the lens of AT. AT provides tools for describing the contradictions within the current practices of global TC and for strategic forecasting of how these contradictions could be brought to a successful resolution. It also enables me to establish the characteristics of a unified multilingual quality approach for this particular work context. I complement the GEF and AT analysis with insights from Skopos theory as a way of incorporating the voices of all stakeholders into the discussion. I conclude this chapter by conducting a micro-level analysis through the lens of ANT to outline leadership opportunities for technical communicators as multilingual quality managers. I also focus on how CM could be an ally or a foe for technical communicators in achieving multilingual quality and in leadership opportunities in global information development.

TENSIONS IN UNDERSTANDINGS OF AND APPROACHES TO MULTILINGUAL QUALITY: MAPPING THE GENRE ECOLOGIES OF THE STAKEHOLDERS

To start my analysis of multilingual quality and CM at DreamMedi, I considered the practices of stakeholders whose work is mediated by the new genre introduced with the implementation of a CMS, chunks of content. Kain (2005) noted that although genres can "facilitate the work of particular communities, they may inhibit communication when different communities come into contact or when a community's work affects people who do not share its knowledge or ways of expressing knowledge" (pp. 377-378). To analyze how the new genre can promote or inhibit multilingual quality, I applied the metaphor of genre ecology. This metaphor allowed me to bring to light the co-existing

contradictory genre ecologies of multilingual quality stakeholders at DreamMedi. I identified three groups of multilingual quality stakeholders: TC stakeholders of the international unit, technical translators, and bilingual reviewers. At DreamMedi, these groups do not necessarily correspond to the job titles of the stakeholders; they rather describe their roles in the process of creating multilingual technical documentation. However, the three groups can be identified on the basis of their roles in relation to multilingual quality and the genre ecologies they operate in. Since the goal of my study was to examine multilingual quality in written technical texts for global end-users, I focused on the formal written TC genres in this genre ecology analysis.

Genre Ecology of the International Unit

The three TC stakeholders who constitute the international unit, Melissa, Rose, and Kelly, were in charge of the technical documentation of DreamMedi in English, Spanish, and Simplified Chinese. The international unit worked with the following texts: "print documents" (e.g., catalogues, brochures, installation manuals, maintenance manuals); online multilingual sales system (web application in English, Simplified Chinese, and Spanish that allows end-users to configure a product, select accessories, receive additional information on any parts of the product or related terminology, and calculate the price for their particular configuration); and desktop English-only sales system (desktop monolingual prototype for the online sales system that is used by end-users in the US). The unit provided information for DreamMedi's website but was not directly responsible for the information architecture of this website. Melissa, Rose, and Kelly had different tasks, different experiences, and different educational backgrounds; however,

they consistently collaborated on creating formal written genres of global TC at DreamMedi.

After the implementation of CM-Master, Melissa was hired to manage it. Her main task was to check the content in legacy literature and the desktop sales system for accuracy with engineers in respective units and then enter it into CM-Master. Melissa called units throughout DreamMedi to confirm with them that the information she was using was correct and up-to-date. She then manually entered chunks of content into CM-Master from legacy materials and the desktop sales system. Melissa explained the benefits of having searchable chunks of content stored in CM-Master in the following way:

> (…) all of our information was previously stored in numerous locations (i.e., spreadsheets, catalogs). We now have a central location where the information is stored and updated. This greatly aids when we make a change. We know that the information stored in [CM-Master[7]] is the most up-to-date and that the web and all literature should reflect what is shown in [CM-Master]. (…) This way, when text or content come into question, [CM-Master] is utilized to determine what is the correct information and other areas are updated accordingly. Another advantage is that a given record can only be stored once, which eliminates the possibility of duplicating data.

As a result, Melissa soon started using CM-Master to help other units, who didn't have access to CM-Master, resolve questions about discrepancies of content in DreamMedi's technical texts. Melissa rarely created these complete technical texts, but she was well

[7] Names of software are modified in quotes from participants' interviews and questionnaires.

aware of the complexities of genres in DreamMedi's TC, partially due to her previous position as a marketing specialist, and partially due to her communication with Kelly and Rose.

Kelly was originally brought into DreamMedi's international unit to create the sales website for China, Mexico, and Latin America. DreamMedi was expanding its business to new markets, but the desktop sales system they had was hard to update and lacked multilingual capabilities. Kelly developed the initial idea of a web-based application system for China, Mexico, and Latin America into a system that included a cross-reference tool, search tool, and ordering tool. She also spent a lot of time researching possibilities for and setting up servers in China and Mexico. Once Kelly created the online sales system, her job involved "mostly just maintenance and adding new data." Kelly's daily tasks devoted to the online sales system consisted of "export[ing] all [of chunks of content] into an XML file, then publish[ing] to the web." To accomplish these tasks, Kelly created midware that extracted chunks of content from CM-Master and entered them into the online sales system. Kelly explained the benefits of the online sales system she created for DreamMedi as providing flexibility (e.g., different users can have different access permissions) and convenience (e.g., users can access information without having to install a program).

Kelly credited Melissa with inputting thoroughly checked chunks of content into CM-Master. She also stated on several occasions that Melissa knew exactly what she was doing and was an expert in DreamMedi's product line because she used to be a product specialist. Whenever verbal or written requests were made to make changes to the online sales system, Kelly first discussed them with Melissa and together they decided on the

changes to chunks of content in CM-Master. Kelly often referred specific questions about "print documentation" to Rose, but she was also aware of the complexities of written formal TC genres at DreamMedi, as she communicated with Melissa and Rose and incorporated various sources of print documentation into the online sales system (e.g., when customer wanted additional information, they could be referred to a FAQ section or a catalogue or prompted to download a manual).

While Melissa was responsible for creating and maintaining chunks of content in CM-Master and Kelly for mediating the relationships of these chunks in several languages to the online sales system, Rose exemplified yet another type of chunks-as-genre co-mediation. Out of the international unit employees, Rose had been with DreamMedi the longest; she had worked with DreamMedi's technical documentation before CM-Master was introduced. Her job was supposed to change a lot after the top-down incentive to implement a CMS came through. The original plan was for Rose to work with the publisher capability of CM-Master to create print documentation. Rose mentioned that chunks of content in CM-Master definitely helped her work because they identified "what belongs where" (drawings, translations, etc). This is how she described the before-and-after writing practices at DreamMedi:

> Before [CM-Master] we would have the literature, we would make revisions, and I would always go through when we check everything, to make sure that … you know, even if when we only change this unit, I'm going to change all the dimensions on all units. Here we'd have the catalogues, we have the [desktop sales system], the website… All these different areas where you could find the same information. And everywhere you looked it was a different dimension. And we spent a lot of time

> looking at each, and it's like these two have this way, and these three have their own. So, I would have to take it back up to engineering, and they would have to look up the drawings, the actual drawings of the product. So, that was very time-consuming, and we still have to do it now and then, but since we started hosting all the data, we kind of said that [CM-Master] is the true value, unless you can prove it wrong. So, when I see discrepancy between two things, I look at [CM-Master] and I say that's the value. (…) It saved a lot of time this way.

However, Rose often felt as though her learning CM-Master could be best described as trial and error, and she saw contradictions between the specific needs of the company and the simplification push from the software that required her to spend countless hours trying to figure out how to adapt the program ("the program was there to save time, and it wasn't saving time"). Rose decided not to use CM-Master's publisher, but rather continued to use InDesign, copying-and-pasting information from the CM-Master's database created by Melissa. Rose's only interaction with CM-Master consisted of copying chunks of content from it or using it to verify the accuracy of information. At the same time, CM-Master helped Rose improve consistency of print documentation, and she was able to create text faster than before CM-Master, since she always had a database of pre-written verified content to rely on. While Rose was mostly working with content written by others, she tried to make it fit into the type of genres she had been working with previously. Yet, the consistency of the print documentation and the speed with which Rose created this documentation satisfied the company, at least at the time of my study.

The genre ecology of the international unit was governed by contingency, a principle that involves "the complex, opportunistic, sometimes risky coordinations among genres that are made by people who are trying to accomplish certain things" (Spinuzzi & Zachry, 2000, p. 173). All three TC stakeholders of the international unit were making connections that were not planned by the system's designers: Rose copied-and-pasted chunks of content; Melissa used chunks to settle discrepancy questions in other technical texts; Kelly created midware to connect chunks of content with the online sales system. However, Melissa, Kelly, and Rose acknowledged one another's practices, and the three of them referred to chunks of content in the CM-Master as a good check point between the various written formal TC genres at DreamMedi.

As a result, the international unit participated in and was aware of the complexity of global TC genres at DreamMedi. TC stakeholders in this unit created chunks of content, print documentation, and the online sales system. They worked with the information in the desktop sales system, even though applied engineers from individual units created content for this system. While Melissa, Rose, and Kelly had different responsibilities in their genre ecology, they communicated with one another and understood what others were accomplishing within their unit. They also had a clear picture of their relations to the chunks of content and of how these chunks mediated their writing practices. Overall, this shared knowledge of one another's writing practices, genre responsibilities, and the specifics of the formal written TC genres at DreamMedi allowed the genre ecology of the international unit to function without an immediately apparent road block—all stakeholders here had a comprehensive picture of their genre ecology (see Figure 9).

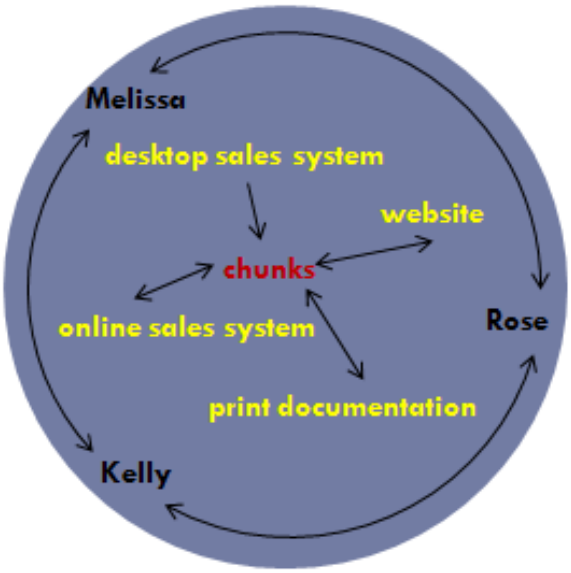

Figure 9: Genre Ecology of the International Unit

In this genre ecology, the formal written TC genres of DreamMedi coexist, even though not all TC stakeholders are equally engaged in all genres. At the same time, the relation of these stakeholders to chunks of content as a genre shapes their approaches to writing. While Rose is more concerned with the print publications, she focuses on the "branding" of the documents and their overall look and feel; for her, chunks are a medium for storing and verifying information. Melissa, on the other hand, sees the goal of her work as creating the database that would have the extensive and expensive information on all the products of the company in all appropriate languages; for her, chunks are separate entities that allow her to segment her work. Kelly interacts with print texts when she includes them as downloadable points of reference; her main focus is, however, to help users assemble descriptions of equipment on the fly, after selecting their desired specifications. This requires fast delivery of consistent information—a task where the new genre is crucial.

GEF replaces the concept of performance and communication with the concept of mediation, thus focusing on the symmetrical relations of individuals and genres. Genres in a genre ecology work intertextually through co-mediation. They categorize, structure, attach to, and transform other genres; in other words, they mediate the relations of writers and their work. Genres are also political, since they enable some purposes, content, and forms, while constraining others (Winberg, 2005). While TC genres for end-users (print documentation and online sales system) were enabled (e.g., improved consistency) and constrained (e.g., complexities with quality evaluation of chunks versus complete texts versus texts assembled on the fly) by chunks at the same time, TC stakeholders of the international unit, I argue, had the benefit of knowing the complexities of their genre ecology. In such a way, they had the possibility of evaluating the genres that end-users would interact with, since these genres were available to them.

The new genre, chunks of content, also mediated the multilingual work of the international unit. Melissa and Kelly both noted that they were responsible for translations. Melissa "weeded out" the content for Spanish and Simplified Chinese to make sure chunks of content described technical properties of the products correctly (sometimes the products were adjusted for the needs of specific markets). In this "weeding out" Melissa relied on her experience of working with DreamMedi's products for several years ("what is right comes from memory"). Melissa exported chunks of content for translation into an Excel file once new information was in CM-Master and sent these tables for translation. When translations of these chunks were ready, she manually copied-and-pasted them into CM-Master. Whenever additional translations were necessary (e.g., chunks of content describing navigational capabilities of the online

sales system that were not in CM-Master), Kelly created Excel tables with them and sent them out for translation. When there were any requests to improve the quality of information in the online sales system from outside of the international unit, Kelly made updates to the system and together with Melissa they updated the relevant chunks of content in the CM-Master database. Rose copied translated chunks of content from CM-Master, pasted them into InDesign and DTPed print documents in Spanish and Simplified Chinese[8]. Whenever there were any requests to improve the quality of information in these print documents from outside of the international unit, Melissa made changes in the CM-Master database. Melissa then asked Rose to make changes in the InDesign files, and Rose made the changes when she had a chance ("even though we might not get to updating the manual for six months, [CM-Master] will be updated, a day or two from us knowing").

Previously, technical translators received complete documents to translate; after the implementation of CM-Master, translators usually only saw Excel tables with chunks of content. This new translation approach of the international unit, however, limited the genre ecology of technical translation. TC stakeholders in the international unit did not account for the complexities that the new genre, chunks, brought into the genre ecology of technical translation.

[8] Due to technical issues with CM-Master, the international unit sometimes deviated from this pattern in Rose's work. However, discussions with the international unit and the management showed that these deviations were rare and the unit wanted to move away from them. Hence, I am not going to elaborate on these alternate practices in this project.

Genre Ecology of Technical Translation

Both technical translation vendors who were working with the international unit at DreamMedi were contractors. David (Spanish vendor) was a freelancer who had been with DreamMedi for seven years. He had worked with complete documents before CM-Master and with chunks of content after CM-Master; so he provided an interesting comparison of how his work changed after chunks of content as a genre started mediating it. Open World Translations (Simplified Chinese vendor) was a translation company that started working with DreamMedi after the introduction of CM-Master. While the reason for the switch of the Simplified Translation vendor had to do with price and quality issues, this switch coincided with the implementation of CM-Master. As a result, Open World Translations only experienced working in the genre ecology mediated solely by chunks of content. Since Open World Translations did not agree to participate in my study and the only way for me to acquire descriptions of their technical translation practices was through their website, I can draw only limited conclusions about their practices.

David was introduced to the company by Elaine (corporate marketing employee who knew his credentials and experience). While David was a graphic designer by education, Elaine knew he was a native speaker of Spanish and asked him to translate a sample document. David "took the challenge and the final translation was very professional" according to the international unit, who, in turn, asked their Spanish for Mexico and Latin America quality arbiter, Marco (bilingual international marketing employee). DreamMedi immediately saw the advantages of one-stop work with David, since he could translate the text and DTP the documents in Spanish.

David was not familiar with the specifics of CM-Master, but he had a series of criticisms about the changes in his translation work processes with the advent of the new genre, chunks of content. He used to be DreamMedi's main source for Spanish translations, and jobs from DreamMedi used to be a big line of his income. "We used to have a goal every year. [Marco] and I would sit down and review what kinds of documents [DreamMedi] is going to need for the year." This situation changed: "I don't have that anymore and I don't know how many projects I'm going to translate." David stopped DTPing translated texts for DreamMedi. Also, since David now mostly translated chunks of content, he didn't feel that DreamMedi provided enough work for him to keep researching product terminology for this particular manufacturer. In addition, he complained that it was not worth his time any more to visit the company and talk about the product with subject matter experts or to discuss the audiences for the translations with the international marketing specialist, Marco. In addition, David expressed his concern about how closely he could come to his quality expectations: working only with chunks of content, he lacked information necessary to determine the context and function of the text, which was critical for adapting the texts to the needs of the audience.

Open World Translations company had joined DreamMedi three years before my study began. Technical translators from the company fulfilled a translation test (250 words), which was approved by DreamMedi-China. The company employed 50 in-house translators and 10 in-house DTP specialists and claimed to create a dedicated team for each of the client's projects. They used a variety of CAT tools (e.g., Trados, SDLX, Wordfast, MemoQ, and OmegaT) to re-use previously translated text. Open World Translations put a lot of emphasis on establishing correct processes in their technical

translation practices, stating that well-developed processes can help "yield twice the result with half the effort." An impressive amount of space on the company's website was devoted to laying out the details of these processes. However, a careful search of the company's website did not reveal any references to specific processes of technical translation with CM. They did mention their expertise with CM-based training (e.g., XML-based reusable learning objects and learning content management systems), but did not refer to any changes in technical translation processes when working with re-usable content, which, I argue (and David and multiple technical translation professional community discussion suggest), is critical. While I do not try to make any distinctive conclusions about technical translation practices of Open World Translation based just on their website, there is an interesting contradiction between the focus on the processes of technical translation in achieving quality and the lack of attention paid to adapting these processes for working with re-usable chunks of content.

The emergence of the new genre, chunks of content, in the genre ecology of technical translation brought drastic changes into their practices—when technical translators translated written formal TC genres, they worked only with chunks of content (see Figure 10). While David (the Spanish translator) was familiar with the genre ecology of DreamMedi because he had been working with the company before they adopted CM strategies and technologies, it was not clear if Open World Translations had such awareness. Open World Translations had experience in translating technical documentation for companies in the same industry as DreamMedi, but only started working with DreamMedi after the implementation of CM-Master.

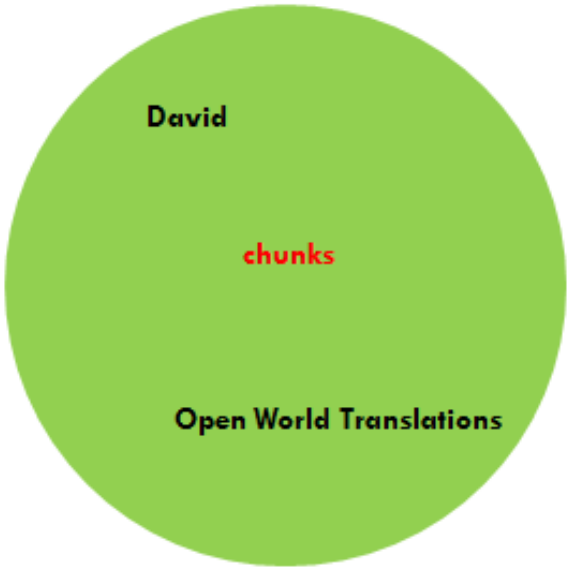

Figure 10: Technical Translation Genre Ecology

David saw the new genre ecology as very detrimental to his established work practices and his success in creating high-quality translations. He didn't feel as connected to the company and mentioned that his expertise was not as much in demand any more. Since he now worked only with chunks of content, he could not devote as much time to researching the information and the product, and he was struggling with finding strategies for adapting the chunks based on audience characteristics, since he didn't know their function or context. David's idea of localizing texts based on the culturally-defined educational backgrounds of readers (e.g., buyers of the product might have engineering education in the US and business education in Mexico) became next to impossible to implement. Overall, David expressed a concern about his future business with DreamMedi, as he ideally saw himself more involved with the overall process of technical text creation. So far, David had not designed any strategies to cope with his new genre ecology. He expressed some mild dissatisfaction to DreamMedi but did not get a

response to his complaints. With David's thoughts about cutting down his work for DreamMedi, one cannot but think about his successors who will know even less about DreamMedi and their products because they will be working in the chunks-only genre ecology from the start.

It is harder to provide a comprehensive picture of the exact changes the new genre brings into the genre ecology of Open World Translations without an engaged participation by the company. However, a characteristic of their self-representation—not providing any references to adjusting quality assurance processes for re-usable chunks of content —suggested that they might not yet have a solution.

As I have described in Chapter 1 and as David stressed, working within the chunks-only genre ecology requires adjusting approaches for technical translation and re-considering the Skopos-defined decisions about a text's function and context. Genre ecologies are characterized by decentralization, the "distribution of usability, design, and intention across the ecology of genres" (Spinuzzi & Zachry, 2000, p. 174). While communicators design a certain genre for a certain purpose (e.g., operation manual to instruct the user), quality cannot be situated in any given isolated genre only. For technical translators, however, quality became attached to chunks of content only.

I argue that in the interactions of TC stakeholders of the international unit and technical translators, the rhetoric of client-customer relations became a road block to discussing the changes in quality approaches and Skopos-defined translation decisions with the emergence of chunks of content as a new genre. Are technical translators reluctant to complain because they are contractors? Are these two groups of multilingual quality

stakeholders, technical communicators and technical translators, following what the new technology dictates without a critical examination of the new technology? While a qualitative study of a single context cannot provide general or full answers to these questions, TC scholars, practitioners, and educators need to think of the complexities CM brings into the understandings of quality by technical communicators and technical translators who work on the same projects. Just as important, however, are the implications of CM for the quality of multilingual technical texts as understood through the eyes of bilingual reviewers.

Genre Ecology of Bilingual Reviewers

During my investigation of global TC quality practices at DreamMedi, several participants, who were not part of the international unit or technical translators, were referred to me as multilingual quality stakeholders. While these participants had different roles and were situated in different units, they were asked to review multilingual technical texts because they were bilingual and knew the specifics of DreamMedi's products in their respective countries.

Marco has been with DreamMedi for over 15 years. He started in customer support service fulfilling a row of administrative tasks, but slowly became responsible for product support in Spanish (his native language) and was promoted to the position of a marketing supervisor for international sales. Marco saw his coordinator role as very important; he often referred to himself as a "single solution" for many customers in Mexico and Latin America. Marco also mentioned that even though he had business education, he was doing much more than his job description entailed: "When you're in the sales and

marketing, you got to be everything." This is why Marco considered it essential for him to know the TC technologies of DreamMedi. When he started his new position he asked the "IT department, all the departments, to supply [him] with every tool they can." He familiarized himself with these tools and continued to get an updated license for his computer. At the same time, while Marco was aware of CM-Master, he had never worked with it and couldn't explain the principles of CM.

Marco was very active in promoting DreamMedi's global educational efforts and creating links with the local community. He described giving multiple presentations in local colleges about business and business communication in international companies, as well as organizing seminars for sale representatives of DreamMedi overseas: "I do a lot of training, 'mano a mano,' with the reps, over the phone, through Skype, WebEx. Because we always say, if you don't give technical support, knowledge, technical training to our people, to our reps, they're not going to sell better, or sell anything." In Marco's seminars he taught that one needs to understand intercultural business ethics: "it's not knowing the language, not just having a degree; it's knowing how to do business, knowing the culture." Due to his focus on the value of intercultural competence, Marco also advocated cultural adaptation of technical texts. He consistently worked with independent sales people in Mexico and Latin America to get feedback on the products and technical documentation that accompanied them.

Alex has been with DreamMedi-China for six years. He was born and raised in China, but went to a technological university in the US for his bachelor's degree in mechanical engineering. His current title was product manager of DreamMedi-China facilities, but Alex mentioned that his tasks varied a lot, "depending on boss's new ideas." He usually

saw himself as a liaison between engineering and marketing, sales, and customers in the Chinese market. He used pre- and post-sale feedback from the Chinese market to continuously improve DreamMedi's products and marketing strategies.

Alex understood the end-users of DreamMedi's products (the readers of multilingual technical documentation) in China as a very diverse group: they are "dealers, consultants, engineers or customers with engineering knowledge [of DreamMedi's equipment]." To get to know the end-users better, Alex contacted sales, purchasers, manufacturing and customer service teams, sales representatives, and end-customers and had extended conversations with them about DreamMedi's products and technical documentation in Simplified Chinese. Whenever there was a post-sale problem, Alex visited the site to help solve it. Alex saw increasing sales for DreamMedi as the ultimate goal of getting to know the end-users better.

To answer the needs of the end-users, Alex worked hand-in-hand with Tammy. Tammy had been with DreamMedi-China for over eight years and moved from customer service assistant to senior marketing support specialist. Tammy helped find a new translation company (a local Chinese company in China, Open World Translations) to save money and improve quality, and she was the reviewer for Simplified Chinese translations. Alex didn't have any contact with the Chinese translation agency, but often proofread and commented on their translations to help Tammy. While Tammy was aware of CM-Master, neither she nor Alex were familiar with the specifics of work with the software; yet, both Tammy and Alex mentioned consistency as an important feature of technical translations. However, Alex also pointed out that DreamMedi needed to improve the quality of technical documentation in Simplified Chinese to make it more culturally

appropriate for the Chinese end-users and described his ideas for doing so with Tammy's help. At the same time, Alex expressed his concerns about these ideas, since he believed that the international unit prioritized format consistency between languages.

Bilingual reviewers at DreamMedi were located outside of the international unit and worked in a genre ecology that was not mediated by the chunks of content (see Figure 11).

Figure 11: Genre Ecology of Bilingual Reviewers

Tammy, Alex, and Marco had a varying awareness of the international unit's implementation of CM-Master, but could not explain the specifics of what CM strategies and technologies entail; they did not know about the changes the new genre, chunks of content, brought to the international unit's practices. At the same time, bilingual reviewers were the stakeholders who understood their audience or the subject matter or both as keys for adapting texts to country-specific expectations of the end-users; they were localization advocates. Marco continuously verified with end-users the quality of

technical documentation in Spanish by asking them targeted questions. He also advocated for the need to educate DreamMedi's sales representatives about the importance of being multiculturally sensitive. However, he believed that he invented a strategy for asking users about the quality of documentation. Marco did not communicate about his ideas and endeavors with the international unit and only reported some basic results without involving Rose, Melissa, and Kelly into this decision-making processes.

While Marco was on the way to developing his localization practices, DreamMedi-China was guided solely by Alex's idea of localization. His conceptualization of implementing localization was different from Marco's. Alex wanted the users to identify documents within the same industry that were originally created in Simplified Chinese and that the users perceived as very helpful. By emulating these sample documents, Alex hoped to be able to adapt DreamMedi's technical documentation to the country-specific expectations of the readers; Alex, however, was worried about how these ideas would be received.

Genre Ecology Tensions and Multilingual Quality

In the previous sections I described the genre ecologies in which multilingual quality stakeholders operate. To get a better look at what these genre ecologies mean for multilingual quality, we need to consider tensions between the genre ecologies of the international unit, technical translators, and bilingual reviewers (see Figure 12) that are introduced after the emergence of the new genre, chunks of content.

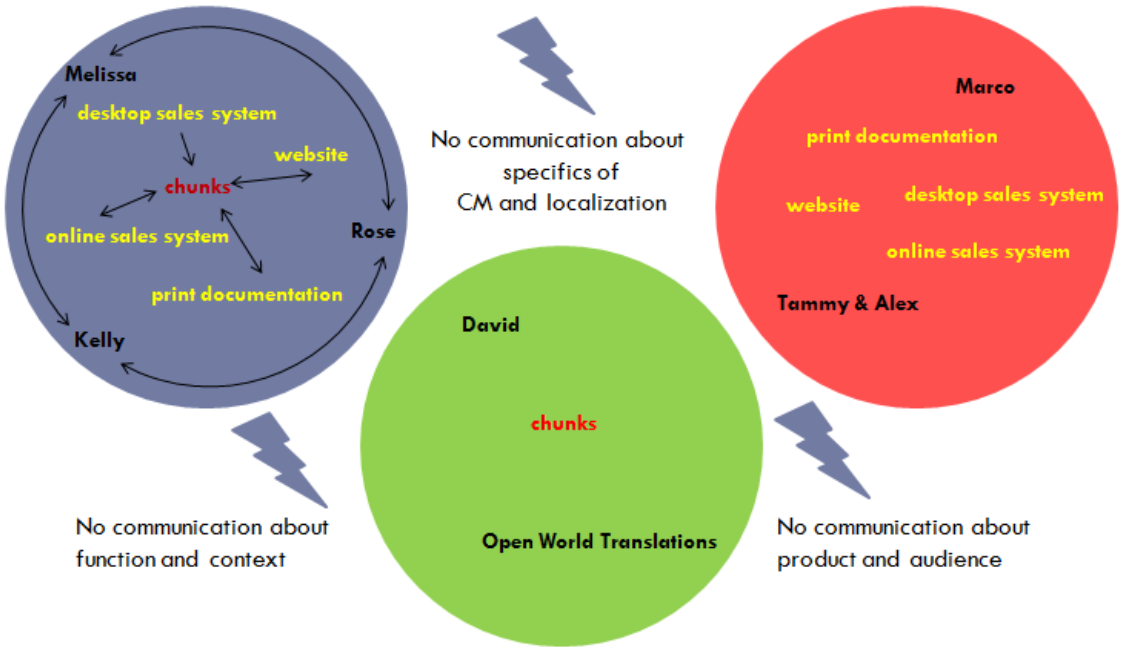

Figure 12: Tensions between Genre Ecologies

Technical communicators and technical translators did not have efficient or sufficient ways of communicating about Skopos-defined translation decisions and the types of changes the new genre brings into technical translators' understanding of context and function. Technical translators were working within the limited perspective of genre ecology, against the best practices and education-based approaches of the field. They did not know the Skopos of the chunks they were translating, since the Skopos could change based on the context into which the chunks would be assembled in the future. Chunks were mediating their translation processes, and they did not have strategies for adapting their quality practices based on this new mediation. In addition, David was translating with less knowledge of the product and the audience.

Another tension in the genre ecologies of global TC in DreamMedi was between the ecologies of the international unit and bilingual reviewers. TC stakeholders of the

international unit did not share their knowledge about their new CM-Master mediated practices with these reviewers. They did not communicate with them about the complexities of their new genre ecology. Consequently, the bilingual reviewers saw the hard work of the international unit as reflected in the *fast* creation of *consistent* technical documentation in several languages. They did not perceive these TC stakeholders as specialists who could have an important contribution to make to localization. As a result, they did not communicate with them about their endeavors of adapting texts for country-specific expectations of the users and disclosed only the feedback they received from personal communication with these users (e.g., "here are some changes").

The implementation of a CMS at DreamMedi changed global TC practices. It introduced chunks-as-genre that separated global TC into three genre ecologies, mediated these ecologies, and created tensions between them. I argue that the contradictory genre ecologies and the lack of stakeholder communication about multilingual quality in CM created the risk of compartmentalizing an understanding of quality by genre and by language. In the context of DreamMedi, multilingual quality stakeholders were still to develop strategies for managing these tensions. I argue that to address these tensions, it is useful to consider global TC practices through the lens of multilingual quality: quality is influenced by these tensions, but quality also has the capacity to unite the three contradicting genre ecologies. In the next section I explore the approaches to multilingual quality at DreamMedi through the lens of AT; my goal in this exploration is to outline strategies for collaborative multilingual quality assurance.

TOWARDS CONTEXTUALIZED MULTIPLE-STAKEHOLDER MULTILINGUAL QUALITY: MAPPING A GLOBAL TECHNICAL COMMUNICATION ACTIVITY SYSTEM

GEF is useful in drawing a picture of tensions within global TC practices of DreamMedi by focusing on the ways these practices are shaped by the relations of the stakeholders to the new genre: chunks of content. AT allows refocusing this examination on the contradictions within the global TC activity system at DreamMedi. This new focus, while drawing on the GEF analysis, provides a powerful lens for tracing how contradictions in the co-mediational actions of the multilingual quality stakeholders and the new genre, chunks of content, are connected to contradictions in the very goal of these actions, achieving multilingual quality. In addition, this lens allows me to question successful continuation of current global TC practices at DreamMedi by outlining contradictions between these current practices and the potential for individual success of the stakeholders. As I will discuss next, I used Engeström's notion of contradictions as the source of change and the concept of zone of proximal development to outline possible solutions.

I will start my examination of the global TC activity system at DreamMedi by identifying constituent dimensions (Engeström, 1987): mediating artifacts, subjects, objects, rules, community, and the divisions of labor (see Figure 13). I will then describe primary contradictions within the mediating artifacts, subjects, rules, community, and the divisions of labor nodes of activity system based on my previous discussion of genre ecologies and trace the connections of these contradictions to the contradictions in the object of the activity system, multilingual quality. Relying on the examination of the secondary contradictions between the outcomes node and the rest of the activity system

and Engeström's concept of zone of proximal development, I will conclude this section by sketching strategies that DreamMedi could use to achieve contextualized multiple-stakeholder multilingual quality.

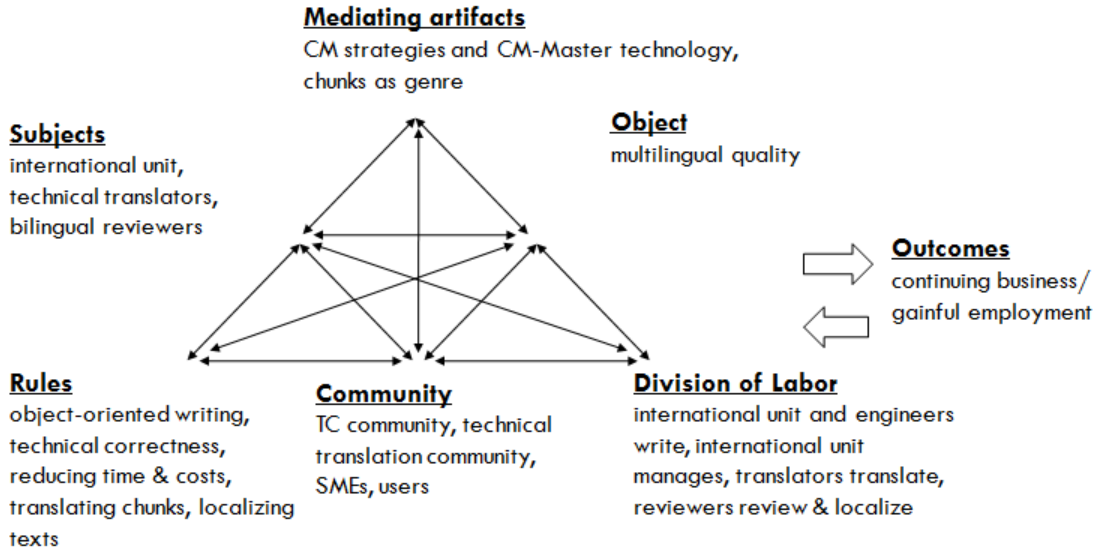

Figure 13: Global Technical Communication Activity System of DreamMedi (Based on Engeström's Meditational Triangle)

Contradictions in the Subject, Mediating Artifact, Rules, Community, and Division of Labor Nodes

Primary contradictions reflect an inner conflict within the nodes (subject, object, mediating artifacts, rules, community, division of labor, outcomes) of an activity system (Engeström, 1987). These contradictions in the activity system of global TC at DreamMedi are introduced at the mediating artifact node—emergence of the new genre, chunks of content, challenges the genre ecologies in which the subjects of the activity (TC stakeholders of the international unit, technical translators, bilingual reviewers) are

operating. However, transformations in this node lead to a chain reaction of contradictions within other nodes of the activity system.

There are three distinct groups of stakeholders in the subject node of the activity system: technical communicators, technical translators, and bilingual reviewers. As I have discussed in the GEF analysis, with adoption of CM-Master a new genre was introduced into the global TC processes of DreamMedi. The work of the international unit was mediated by CM-Master and chunks-as-genre: TC stakeholders in the international unit verified the accuracy of information based on the chunks in the CM-Master; they composed chunks, sent chunks for translation, assembled or copied-and-pasted chunks into print documentation and online sales system in English, Spanish, and Simplified Chinese. The work of technical translators was mediated by the new technology and the new genre as well. Technical translators had to change their practices drastically to translate chunks of content and they built their relationship with DreamMedi based on this change.

However, the new genre, chunks of content, created contradictions: TC stakeholders in the international unit were not completely aware of the complexities the new genre brought into creating technical texts in three languages. For example, technical communicators were not aware of the difficulties with functionless and contextless technical translation; bilingual reviewers were not aware of the changes in TC practices of the international unit; and technical translators stopped communicating with bilingual reviewers and subject matter experts. While the meaning of the new genre was different for different groups of stakeholders in the activity system, these differences did not

prevent them from carrying on their activities towards the object of the activity system, multilingual quality.

The representatives of these three groups of multilingual quality stakeholders saw their efforts as separate from other groups. It is not surprising, then, that these stakeholders did not have a clear picture of other groups' expertise and work practices. Bilingual reviewers who communicated with end-users and advocated localization of technical texts did not ask technical communicators about their expertise in usability. TC stakeholders of the international unit did not talk about their commitment to efficiency with CM-Master. These groups did not combine the expertise of technical translators and bilingual reviewers/localization advocates in culture and language.

All stakeholders drew on their particular knowledge base to conduct their activities; they also drew on agreed-upon rules and non-verbalized rules within DreamMedi or within their disciplines. Interpretations of these rules were created on the basis of their experiences, backgrounds, or contextual knowledge. These rules "mediate[d] activities, they enable[d] communication between people, they encourage[d] reflection on activities, they play[ed] a role in inducting new members into activities, they [brought] different meanings and approaches to bear on a problem simultaneously" (Winberg, 2005, p. 17).

The rules of the global TC activity system at DreamMedi included writing in an object-oriented paradigm, ensuring technical correctness, reducing time & costs, translating chunks, and localizing texts. Since the stakeholders were not aware of the complete picture of the rules they were following, the total did not equal the sum of its parts in the

end. Rules for achieving multilingual quality resulted in a patchwork approach rather than a consistent negotiated strategy.

In this activity system, TC stakeholders of the international unit and engineers wrote, TC stakeholders of the international unit managed, translators translated, and bilingual reviewers/localization advocates adapted. In this division of labor two contradictions arose: Melissa, Rose, and Kelly did not participate in audience analysis for multilingual texts and technical translators did not participate in localization efforts of bilingual reviewers/localization advocates. Such division of labor separated the tasks from the work groups who traditionally perform them (e.g., TC departments possess the most expertise in audience analysis; technical translators possess the most expertise in localization). The tensions also posed a question: did the international unit really manage multilingual documentation in this context?

This division of labor and resulting lack of communication between global TC stakeholders also introduced contradictions into the community node of the activity system. Bilingual reviewers/localization advocates relied only on their own interpretations of what cultural adaptation means and the availably of contacts to the end-users. While their work showed much potential for success, it stayed within their respective units, and other localization advocates were re-inventing the wheel. Moreover, the separation of localization advocates from TC and the technical translation community resulted in the fact that the wealth of experience and knowledge of TC and technical translation was left untapped. This wealth of experience and knowledge became invisible, and so did the respective competencies of TC stakeholders in the international unit and technical translators.

Contradictions in the Object Node

The work of the TC stakeholders in the international unit, technical translators, and the bilingual reviewers/localization advocates is directed toward creating high-quality multilingual technical texts. While all stakeholders perceived their work as directed toward this common object, their understandings and approaches of the object differed. Engeström (2000) notes that "while the object and motive give actions coherence and continuity, by virtue of being internally contradictory, they also keep the activity system in constant instability" (p. 964). At DreamMedi quality as an object of the global TC activity system had deep internal contradictions. Table 4 represents a summary of these contradictions.

Stakeholder	Definition of Multilingual Quality	Method of Achieving Multilingual Quality
Rose	Focusing on expert review and avoiding objective "human" errors (wrong graphics, different formatting, missing text, measurement conversion)	Delegating the tasks to translators and bilingual reviewers at DreamMedi; viewing Melissa as a medium in this delegation
Melissa	Focusing on technical accuracy, consistency, but valuing end-user understanding	Relying on CM-Master, her own memory; "weeding out" English text; being aware of who does what; implementing suggestions by bilingual reviewers
Kelly	Focusing on consistency and accuracy	Looking for inconsistencies in translated content; implementing suggestions by bilingual reviewers; questioning current practices and deliberating a company-wide discussion

David	Speaking the language the reader understands and adapting texts based on country-specific "tastes, environments"	Understanding technical complexities (through communication with engineers) and adapting the levels of technical complexity based upon audience characteristics (through communication with marketing); re-using previously translated text
Open World Translations	Focusing on consistent terminology, style, and processes	Hiring qualified in-house native speakers as translators; using CAT software; developing translation-editing-proofreading procedures
Marco	Rejecting the idea of perfect quality in favor of striving for balance while taking into consideration culture and regional language variations	Reviewing; communicating with end users and localizing texts; educating colleagues
DreamMedi-China (Tammy & Alex)	Ensuring technical accuracy and correct grammar; contradictory combination of consistent formats and local texts imitation	Checking for technical accuracy and grammatical correctness; planning to model technical documentation based upon good local examples

Table 5: Multiplicity of Approaches to Multilingual Quality

Multilingual Quality for Rose

When Rose described multilingual quality, she enumerated wrong graphics, missing text, and inconsistent layout as possible problems that she could address on her own and referred to reviews by engineering and marketing supervisors who were speakers of the relevant language as a solution for all other possible issues. According to Rose, at the time of my study, the international unit was doing a better job with multilingual quality

than corporate marketing used to do in the past. The international unit was making content "more specific to the product they have there, because their voltages are different or they don't offer as many sizes of that product as we do here." Rose called this adapted information "somewhat tweaked," but noticed that "most of the data [was] the same; it [didn't] change much."

While Rose was not familiar with all the vendors DreamMedi was using for Spanish and Chinese, she noted that their vendors re-used translations (Rose could not describe the specifics of translation re-use, though). She knew that David translated into Spanish, because his "technical background and writing skills work[ed] well with [DreamMedi's] products." She did not know the Simplified Chinese vendor. To ensure that their translation vendors delivered good quality, Rose remembered Spanish and Chinese speaking employees of DreamMedi reviewing sample translations performed by the vendors.

Rose, however, complained that while working with Spanish was usually pretty smooth, Chinese texts were "like pulling teeth." Her major concern was that after the international unit asked employees of DreamMedi in China to review the translations, "three people could come back with three different ways to say it." Rose didn't handle any review communication with these employees (Melissa did), but she implemented any changes that Melissa gave to her after Melissa received them from the reviewers. Rose lamented that "it [was] hard to let [reviewers in China] know that this is your only chance. It seems like we'll change it and then two weeks later we get another copy. You already had your chance, you know. Sometimes we get changes a month after we have already printed."

Rose noted that it could take her up to several months to implement these suggestions for changes in the multilingual texts.

Multilingual Quality for Melissa

Melissa saw good-quality texts as accurate, consistent, and valuable (both to sales representatives and end-users). A good-quality translation, then, was accurate and written in a language people actually speak.

To accomplish good translations, Melissa saw her task as finding "a quality translator who understands how our technical writing needs to be translated." Melissa remembers that the international unit was originally planning to work with a different vendor for Spanish, but there were complaints about quality, and they decided to utilize David based on a recommendation from the corporate marketing department. For Chinese, DreamMedi's employees in China were not happy with the quality of the translations from the international unit's previous translation agency. Therefore, a mutual decision was made to give the responsibility for finding a new vendor to the Chinese employees. Melissa also mentioned that TM was a big selling feature of a translation company, since a TM saved money and helped make translations more consistent.

Melissa also described working with Marco, Tammy, and Alex to review translated texts. Melissa noted that while the international unit did not "formally request feedback from the users of our documents," their sales representatives "often provide[d] (…) feedback in regards to how our catalogs compare to competitors." She admitted that "a fair amount [of complete texts came up] that needed to be changed according to what they're saying."

No matter when and how many times Melissa got suggestions for change from Marco, Tammy, and Alex, she updated CM-Master right away.

Multilingual Quality for Kelly

Kelly saw quality as "information that is consistent wherever it is displayed" and "information that is accurate." Similarly, a good quality translation for her meant "that the same information is translated the same way wherever it is used, and that the translation is accurate."

However, Kelly had some concerns about current technical translation practices and achieving quality. Kelly wished that both translation vendors would have TMs connected to CM-Master to avoid inconsistencies in translations. Kelly also noticed that certain attributes from CM-Master that could not be translated the same way (because they had two different terms in English) were often translated the same way when they were translated separately. Kelly said that she hoped to catch these instances most of the time, but was not sure if she missed any. Whenever she found these issues, she consulted with Marco, Alex, and Tammy and always followed their suggestions. Marco, Tammy, and Alex also "spot-checked" the online sales system before it went live. Many times after "spot-checking" multiple changes needed to be made. Kelly attributed many of the changes to the fact that translators only saw an Excel file, which was "not the same as seeing it in context." Kelly mentioned that they always sent the changes they made to the translators, but since the translations can differ based on the context, she was not sure if this solved the problem. Kelly didn't think that her unit or the company as a whole "sat down to consider the best way to manage data and translations."

Multilingual Quality for David

For David, multilingual quality meant that target readers understood the information. David saw translation re-use as one way of achieving multilingual quality, since DreamMedi's documentation had a lot of the same content between different types of texts (e.g., catalogues and brochures), as well as many updates to the older texts. Re-using previous translations allowed David to make his translations more consistent. He relied on his knowledge of the product and technical documentation of DreamMedi to re-use translated content through copying-and-pasting it from previous translations. Yet another way of achieving quality, according to David, was his understanding of the information about the product and the product itself, as well as the audience. David recounted visiting DreamMedi and talking to engineers and international marketing specialists on multiple occasions. He put special emphasis on the fact that many people think of translation as a word-for-word practice; in David's view this was wrong—"translating exactly the words sometimes doesn't mean anything or simply doesn't make sense." In David's opinion, a good translator needs to be aware of "different tastes and environments," but still preserve the meaning of the original text. So, for David his translation work for DreamMedi often involved simplifying the language, since Marco informed him of country-specific differences in educational backgrounds of the users. To ensure multilingual quality, David also established a procedure that consisted of three rounds of reviews. While he conducted these three rounds himself, through allowing time between reviews and varying the order of reviews David managed to catch different types of errors. After David completed his three rounds of review, he sent his translation for final evaluation to Marco.

Multilingual Quality for Open World Translations

The evaluation of the website of the Open World Translations showed that the company defined quality through experience, established procedures, hiring qualified translators, dedicating the same group of translators for the projects by the same client, and focusing on only three languages. They consistently referred to quality in translation and localization when promoting their services and comparing themselves to other vendors on the market.

To provide quality translations and localizations, Open World Translations boasted of implementing a series of solutions: using only in-house translators; adopting a translation-editing-proofreading procedure with three different translators fulfilling different steps; creating a dedicated team for each large project (project manager, translators, editors, and proofreaders); developing a term list and a style guide for each project (and making sure the team is familiar with them) to improve consistency; using CAT software to ensure consistency; and working with native speakers only.

Open World Translations also provided a detailed and extended description of their translation, editing, and proofreading quality assurance processes on their website. They boasted of treating projects of all sizes as important and having a scientific and effective quality assurance processes optimized during their 15 years of experience. Based on the descriptions on the company's website, it seemed that the company referred to localization as translation of all elements of software applications, websites, or training data. They described preserving all processes of translation, but include "freezing the source code" to the planning stage and add one additional stage, testing (linguistic

testing, functionality testing, configuration testing, and loading testing, user interface testing, and compatibility testing).

Multilingual Quality for Marco

For Marco, "there's never a good enough translation," because "it's not easy to keep everybody happy. Because (…) one side of market thinks you're weird, the other side thinks you're right. (…) There's never a balance, but you have to be in the middle, to get some type of balance." Multilingual quality for Marco, however, was very important; he often stressed that "you have to do your homework" when it comes to multilingual quality, because "surprises cost too much money to review."

Marco identified several complexities one had to address in multilingual quality management. He equaled culture primarily to country and language specifics. He stressed how important it was to be immersed in what's going on in a particular country, as well as to know the differences between the languages the countries he worked with speak (e.g., Spanish for Mexico, Spanish for Latin America, Spanish for Dominican Republic). This immersion helped Marco distinguish differences in backgrounds of end-users in different countries (e.g., engineers, contractors, consultant engineers, they could be architects, and some of them could be just regular business owners). Culture for Marco also included business ethics. For example, he mentioned that his clients "don't want to deal with the engineer at the factory, or your boss; they see you and they want you to be the only contact and the solution. That's how our [Mexico, Caribbean, Latin America] culture is." According to Marco, it was also important to "rearrange these pictures" and "format this page to fit the translation," because "sometimes English is one line, and

Spanish can be three lines." In addition, anything from printing specifics (different paper sizes) to metric conversion needed to be taken into account.

Marco provided multiple examples of technical terms that differed across the regional varieties of Spanish. He always stressed that importance of going with a more universal term that would allow DreamMedi to have just one version for Mexico and Latin America. To pick which term to use, Marco asked his customers: "So, you pick someone and ask them if they would understand this term. And they say: yes, somewhat. And how confident is that? 60, 80, 90%? 80%. I say that's good, even 50% is good."

Marco described communicating with "the reps, the guys who are on the street; the salesmen, or even a good end customer" not just to find out about terminology but to improve the quality of translations in general. "Because I work with those reps, I work with their customers. (…). Deal with them on a day-to-day basis. For instance, we talk to our offices in Chile every day, in Argentina, in Colombia, in Peru, in Bolivia, in Ecuador, in Uruguay, in Panama, in Costa Rica, in Guatemala." Marco came to the reps and customers with specific questions, and he noted that they were always willing to provide answers because of their good working relations.

For Marco it was also extremely important to have colleagues he could rely on. Marco noted that David definitely added a lot of value to the quality of multilingual documentation, because he had worked with DreamMedi for several years and knew how to select appropriate terminology (and knew whom to ask if he's not sure). Marco also mentioned Melissa's commitment to verifying technical accuracy and Kelly's fast responses when anything needs to be changed in the online sales system ("she is our guru

(…). I ask her: '[Kelly], we need to change that, the reps are complaining about this.' And she's like: 'Oh, I can fix that.' She's of great help.").

Multilingual Quality for Tammy and Alex

To my questions about definitions of quality Alex consistently referred to two important aspects. To him, the biggest part of technical translation was engineering knowledge (Alex's responsibility); the second part then was correct grammar (Tammy's responsibility). Alex mentioned the importance of high-quality technical documentation in increasing sales and decreasing post-sale problems. For Tammy, quality meant that readers did not realize that a technical document was a translation; nothing in a good document gave away the fact that it was not originally written in Chinese. Tammy also worked with engineers if she had problems with understanding any technical information, since she valued expert opinion from her engineering colleagues as a source of quality assurance. However, Tammy consistently pointed out the importance of preserving the formatting of the original texts in English when they were translated into Simplified Chinese, since her impression was that this is what is valued by their US counterparts.

To achieve good-quality on technical documentation, Alex and Tammy worked hand-in-hand. Tammy reviewed translated text for "arrangement, text, grammar, and fluency," while Alex checked the correctness of "technical data" by matching it to the English version. Alex and Tammy also put emphasis in achieving multilingual quality by selecting a well-qualified translation company. Alex and Tammy described in similar ways the process of selecting a new translation company three years before my study. Alex and Tammy compared three companies based on sample translations. There were

two reasons for switching the translations vendor: price and quality; he further noted that their choice of a new translation vendor was based on how technically accurate the translations were, if they provided "a good translation of engineering parts." Now, to ensure translation quality, Tammy provided Open World Translations with a term base. "Because, for example, if it's the same product or model I would tell them this content should be translated this way. (…) Then they read our materials on the computer. So, the people already know what I'm talking about, they know what we want. Fortunately many of our translators, they are from the same industry as [DreamMedi]."

However, Alex and Tammy admitted that customers complained about DreamMedi's documentation in Simplified Chinese. They attributed some problems with translations to the fact that the translation company used different translators for different projects. At the same time, Alex also mentioned that to achieve good quality they needed to make sure end-users understood the information: "Sometimes our readers have some questions about the catalogues although we think they're good. So, I think that cultural differences have not found a good way into our documents." Alex hoped to improve DreamMedi's technical documents in Simplified Chinese by adapting them for the Chinese readers. He was developing a plan for such adaptation that included inviting end-users to identify local technical documents that they saw as good; then, these documents could be used as references for future translations or for re-creating DreamMedi's technical documentation in Simplified Chinese. Alex stated, however, that "maybe that's the wrong way to do it, because we have to keep the format match our English versions." Overall, the storylines of the multilingual quality stakeholders provided me with an excellent base for analyzing

contradictions in the object node of the global TC activity system through the multiplicity of the understandings of and approaches to multilingual quality.

While the introduction of CM-Master seems to have alleviated some of the issues with multilingual quality, such as tracking information and consistency, it also led to complications:

- *Promoting false perceptions*

  Introduction of CM-Master seems to have created a false belief for some of the TC stakeholders of the international unit that the problems were solved.

- *Creating new problems*

  Mediating work of the chunks of content introduced additional problems that hadn't existed before. For example, while the international unit delegated the tasks of technical translation and relied on software, translators, and bilingual reviewers/localization advocates to ensure multilingual quality, technical translators visibly struggled with the shifts in the quality assurance after the introduction of CM-Master and bilingual reviewers/localization advocates went their separate ways in fulfilling the idea of localization. In fact, these localization advocates saw quality as a result of their "single-handed" efforts of communicating with users and adopting texts to their needs.

- *Promoting "circles of ambiguity" in approaches to quality*

  In a way, this situation reflects the general state of "circles of ambiguity" that surround the definitions of multilingual quality and the lack of collaboration in achieving quality between TC and technical translation professionals— the situation

I described in Chapter 1. Such ambiguity is very detrimental to the global TC activity system, since it brings instability into the system: David contemplated continuing business with DreamMedi; Tammy and Alex were wondering if their localization plans would be taken seriously; Marco, Tammy, and Alex could not learn from one another's localization experiences; end-users complained.

Contradictions in the Outcomes Node

In the activity system of global TC at DreamMedi, outcomes are continuing business/gainful employment (that is, survival of DreamMedi and of the individual businesses of technical translation vendors). The employees of DreamMedi hoped that the company continued to exist and flourish, while they maintained their salaried positions within it. Technical translators hoped that their individual businesses would be continued. However, differing understandings of and approaches to the object node (high-quality texts) introduced contradictions to the outcomes node.

In ever-changing workplaces, employees who continuously increase the visibility of their skills and competencies (that is, show the value they bring to the business) have the highest chances to remain gainfully employed and/or to be promoted. For the TC stakeholders in the international unit, one way to increase their visibility is to establish their position as leaders of global information development and multilingual quality management (that is, attracting users with creating high-quality technical texts). Thus, to stay gainfully employed and get promoted, these stakeholders need to reconsider their practices and create strategies for creating a contextualized multiple-stakeholder definition of what "high-quality technical texts" mean. Managing multilingual quality in

CM contexts, I argue, is a strategy not for just for showing value added, but also for safeguarding the importance of rhetoric and culture in global TC. Otherwise, these stakeholders risk reducing their roles to being software-dependent workers whose sole task is producing consistent texts fast, which is, arguably, not an ideal position.

However, not changing the practices also creates the risk of discounting expertise of the technical translators who might not feel inclined to continue complaining about the change of strategies to keep business. David originally viewed complaining about new practices as creating an unfavorable picture of his expertise—if he continued complaining about the problems with translating chunks of content, the international unit might have reached the conclusion that he didn't quite know what he is doing. Later David saw that to continue successful business (to have enough translation work and to keep a good reputation as a translator who does quality translations) he might have to discontinue his work for DreamMedi.

Not changing the practices creates yet another undesirable outcome. While Alex and Tammy were questioning their ideas of possible localization, and Marco couldn't share his experiences with them, there were more employees at DreamMedi who were working with the ideas of localization without having direct lines of communication to other localization advocates. For example, Ben and Laura from business unit 1 believed that Ben invented the strategy for asking global users about the quality of technical documentation. Business unit 1 has been consistently introducing new products to the market and continuously required new technical texts. The manager of the unit, Ben, was with DreamMedi for over 14 years in different roles, but at the time of my study was responsible for post-sale customer support and developing "road maps" for the coming

years. For Ben, providing good technical information was one of the strategies for reaching the target in sales that he was "hit with" every year. Ben coordinated the work of his unit and made sure that Laura (application engineer who created most of the content about the unit's products for the desktop sales system) had necessary information and resources.

For Ben and Laura, quality of multilingual technical documentation "starts with accuracy. A good quality document formats quality information in a way that the user can understand it." Laura achieved quality by speaking "with the engineers, people who created the product, and also people who are selling it, because they know what the customers are asking, or they know the language the customers referring to those things at, they know how to lay it out so that people who read it understand it." Laura stated that she knew about the users mostly thanks to "leveraging industry literature" and the specific user-centered activity that Ben invented. To make sure users can understand the information, Ben saw the importance of adapting this information based on users' country-specific backgrounds and needs. That is why he designed this user-centered activity once his unit started creating technical documentation for Canada. Since there were different requirements for electric and gas appliances in the US and Canada, the unit provided safety labels required by law in French and left the rest of technical information in English. Ben described going to Quebec and meeting with design engineers, installing contractors, and sales representatives once they started considering French for Canada translations of their whole range of technical documentation. His main intent was not to sell, but rather ask them for help. "And what we've found is that they are typically more than willing to speak with us and to review [technical documentation], because they

realize that in the end it will help them too, because it would make their installation process go faster." After the success of these measures in Canada, Ben implemented them in the US. Ben described setting up

> "a week's worth of meetings, so when we go out, we basically interview them (…). And we take detailed notes. And at the end of the week we come back, we compile all the notes, compare similar comments, and then also try to identify outliers, because, you know, humans are kind of creatures of habit. (…) And then we rank them in priority, and we rank them as to what's going to be the most beneficial to us from our sales or profitability perspective. Rank these priorities and then assign projects and project leaders to them, and then go on and implement what we've heard."

Based on the information of Ben's user-centered activities, business unit X tried to include all of the major requests from the users into technical documentation. However, Ben was not sure if including all information for all requests is the best strategy: "There are some complaints. In my opinion it is caused by individual user requirements. We try and portray our information in a way that meets the masses' needs, but sometimes individuals look for something different."

When subjects are pulled by contradictions at the level of the individual "people experience double binds, seemingly irreconcilable demands placed on them by the pull of two competing motives" (Russell, 1997, p. 532). At DreamMedi subjects were often torn by the contradictions between the outcomes of their activity and the rest of the activity system. For instance, technical translators kept translating even though they did not have

a strategy of dealing with contextless and functionless text because they wanted to keep business; Tammy and Alex were torn between their belief that format consistency is a valuable characteristic of multilingual quality and their intuitive desire to start localizing technical texts. I will argue next that developing strategies for contextualized multiple-stakeholder multilingual quality can help reconcile these contradictions.

Contextualized Multiple-Stakeholder Quality

The contradictions in the global TC activity system have critical implications for multilingual quality at DreamMedi. First, TC stakeholders in the international unit were distancing themselves from the multilingual quality, a fact that was also reflected in the perceptions of the stakeholders dispersed throughout the company. Second, technical translators did not have that much influence on multilingual quality. Quality became a genre-mediated and genre-ecology bound concept. At the same time, none of the stakeholders had strategies in place for negotiating multilingual quality with stakeholders functioning in different genre ecologies. All stakeholders understood and approached multilingual quality differently, responding to individual customer complaints and solving problems as they appear. While Kelly started to realize a connection between contextless translation and quality issues, she did not yet have a strategy for addressing the problem; still, she could potentially be the agent of change, since she started considering a company-wide discussion of the current practices.

To start a company-wide discussion, Kelly or any other TC stakeholder, I argue, would need to develop strategies for creating a contextualized multiple-stakeholder definition of multilingual quality. The GEF and AT analysis shows that such a definition has two main

characteristics: (a) everyone was aware of this definition and what it entails and (b) everyone could abide by it in good conscience. To possess these characteristics this definition needs to (a) represent the views of all the groups and stakeholders; (b) represent organizational pressures and include (at least some) strategies for managing them; (c) consider particular technologies and explain how the approaches to multilingual quality rely on the benefits of these technologies and addresses their limitations.

To create strategies for achieving contextualized multiple-stakeholder multilingual quality I use the concept of the zone of proximal development from AT, because it helps outline changes in the activity system that bring successful resolutions to its internal contradictions. In activity systems, the motive for change efforts arises when contradictions within its nodes are analyzed and possibilities for a new form of the object are projected as an expansive solution for these contradictions (Engeström, 1999). Engeström called this projection "a zone of proximal development for the collective activity" (p. 66). While the goal of each activity system has a fixed end state, the zone of proximal development is "the area between the present and foreseeable future" (p. 66) or "the distance between the present everyday actions of the individuals and the historically new form of the societal activity that can be collectively generated as a solution to the double bind potentially embedded in the everyday actions" (Engeström, 1987, p. 174). Engeström (1999) argues that if this zone is not established, "specific goals are built on sand, or pinned onto thin air" (p. 66).

How can the activity system of global TC at DreamMedi become "the foreseeable activity in which the contradictions are expansively resolved" rather than "the foreseeable

activity in which the contradictions have led to contraction and destruction of opportunities" (Engeström, 1999, p. 67)? In Figure 14 below I depict possible resolutions.

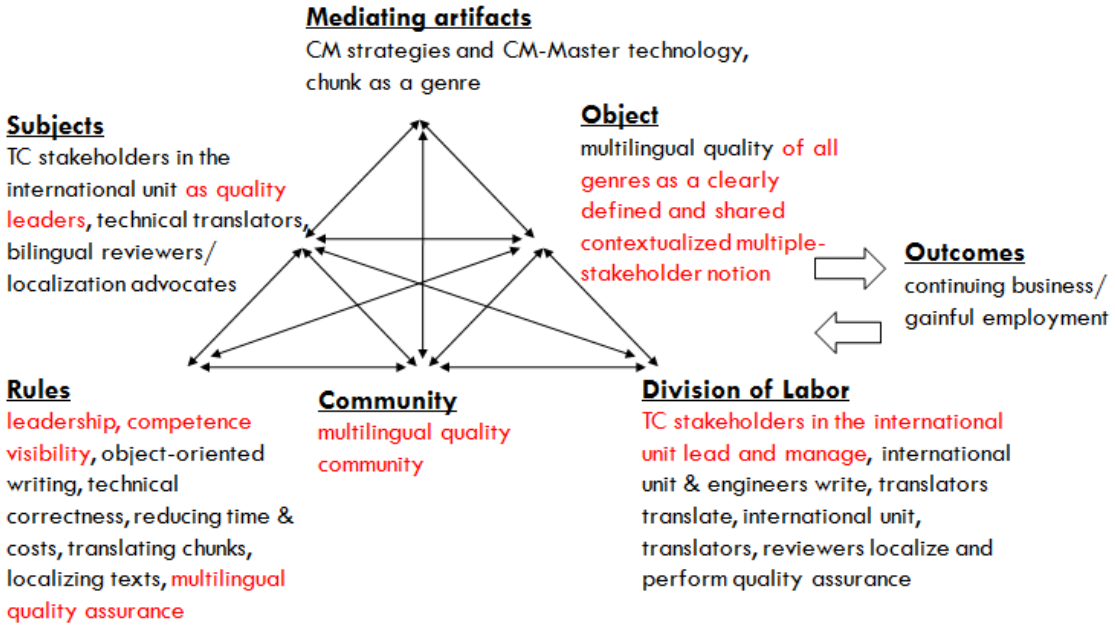

Figure 14: Foreseeable Expanded Global Technical Communication Activity System

AT conceives of developmental transformations as "attempts to reorganize, or re-mediate, the activity system in order to resolve its pressing inner contradictions" (Engeström, 1999, p. 67). The most important change that happens in this "foreseeable expanded activity system" is the communication about what multilingual quality means for this particular context. Quality is not a fuzzy concept better left alone anymore; it is rather a topic that is discussed during meetings by technical communicators, technical translators, and localization stakeholders. As a result of this discussion, the community of multilingual quality is not separated into several groups anymore; rather, this is a community of stakeholders who are at the same level of awareness about the activities others are involved in and the rules they are following. An important part of the change in

rules is that stakeholders work toward a shared approach of achieving multilingual quality, which is based on the fact that they know one another's competencies, as well as challenges based on a joint discussion. Below are sample questions to guide such a discussion at DreamMedi:

- *Sharing the understanding of multilingual quality*
  - ✓ How do we identify and invite all multilingual quality stakeholders (irrespective of their job titles and contractual relations to the company) into the multilingual quality dialogue?
  - ✓ What can we do to make sure that all voices are welcome in this dialogue and we avoid the risk of undermining opinions before they are expressed (since such undermining silences the opinions and inhibits knowledge sharing)?

- *Engaging in global audience analysis*
  - ✓ How can we define the characteristics of our global end-users, what strategies are we already using to communicate with global end-users, what strategies can we still develop, and which stakeholders need to be involved in global audience analysis?
  - ✓ What are the sources outside of our company where we could further learn how to ethically research our end-users while keeping in tune with our business goals? How can we encourage and promote such learning?
  - ✓ How can we apply the results of this audience analysis to global TC practices based on our organizational needs and business strategies?

- *Using technologies to enable multilingual quality*
  - ✓ What global TC technologies (e.g., CM, CAT, DTP software, midware, web management applications) do we have in place and how do these technologies enable and inhibit global TC?
  - ✓ How can we encourage all of the multilingual quality stakeholders to evaluate these technologies and investigate more beneficial or suitable technological solutions or adapt existing technologies to better fit our needs and goals?

- *Ensuring continuity in improving multilingual quality practices*
  - ✓ How do current multilingual quality assurance practices contribute to the success of our technical texts? What other processes and measures can we implement to improve our multilingual quality assurance?
  - ✓ What are the criteria with which we can evaluate the success of our multilingual quality improvement endeavor?
  - ✓ Who is going to lead the multilingual quality management? What skills and competencies does this leader need to possess?
  - ✓ What strategies can we put in place to promote consistent but time-efficient re-consideration of the answers to the questions above?

As, I hope, my analysis of multilingual quality and CM at DreamMedi has illustrated, including the voices of all multilingual quality stakeholders into a dialogue based on the questions above would provide interesting and highly beneficial answers and outcomes. The starting point of this dialogue is, however, the involvement of a researcher of workplace contexts who outlines problems and sketches recommendations for action; these actions then are guided by a representative of the workplace.

Who would be responsible for bringing resolutions to the contradictions in the activity system by starting the discussion about multilingual quality? I argue that the TC stakeholders of the international unit are ideally positioned to take this role: to become mediators of the three groups, managers of multilingual quality, and, as a result, leaders of global information development. First, they have access to all the groups participating in the multilingual quality. Second, they possess the most comprehensive knowledge about the various sides of TC technology. Third, they have access to the TC community with its focus on user-centeredness and the rhetorical skills. However, these stakeholders need to learn how to research and listen, and how to invite and allow in opinions of other stakeholders. They also need to make their tasks and skills visible in order to showcase necessity and validity of the multilingual quality discussion.

GLOBAL TECHNICAL COMMUNICATION ACTOR NETWORK: MEDIATING IDENTITIES AND LEADERSHIP OPPORTUNITIES

Previously in this chapter I provided a detailed analysis of the changes the new genre brings into the multilingual technical documentation practices at DreamMedi and explained how quality is impacted by these changes. I focused on the mediation of multilingual quality stakeholders by the new genre, chunks of content, which emerged after the adoption of CM-Master. This analysis allowed me to explore changes in the global TC practices of the international unit at DreamMedi. However, the genre-ecology and AT analysis provided only a work-group and company-wide picture of changes. I argue that we also need to focus on the actions of individual actors who forge and abandon alliances with technology, genres, and other actors to secure the stability of their

networks (i.e., their importance within a workplace context). At DreamMedi this level of analysis is particularly critical, since the three technical communicators (Rose, Melissa, and Kelly) take very different stances toward CM and multilingual quality and, as a result, establish very distinct positions within the company.

In this section, I will look at the actions of individual TC stakeholders in the international unit through ANT's process of translation. Callon (1986b) defines four layers of translation:

- problematisation (an actant tries to establish itself as a passage point between the other actants and the network)
- interessement (an actant tries to interest and attract other actants by coming between them and the network; it then negotiates terms of involvement with the goal for recruiting)
- enrolment (other actants accept the offer, become alliances, and a network is formed)
- mobilization of allies (enrolled new alliances are able to start interesting and attracting or creating their own sub-networks).

This analysis allows me to unpack how they form rhetorical-political alliances with CM technology, chunks-as-genre, and other actants, shaping the intermediated network of global TC (see Figure 15).

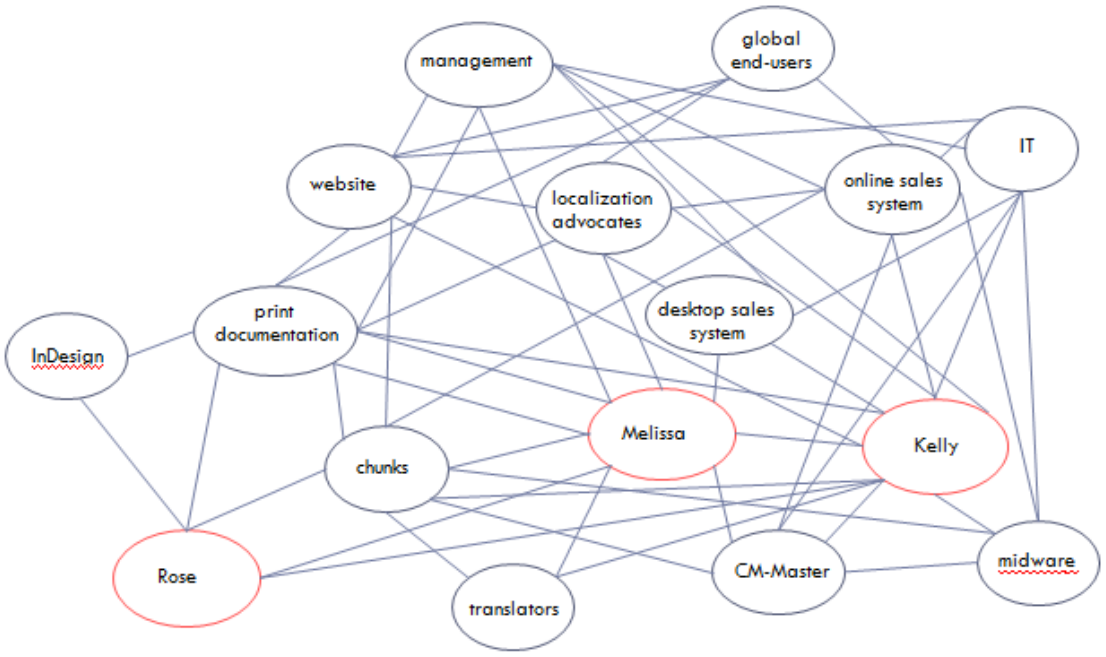

Figure 15: Intermediated Global Technical Communication Network at DreamMedi

I will also analyze the resulting possibilities of each communicator in becoming a leader in global TC and in advocating user needs and the value of the profession.

Rose: Limited Alliances in the Global Technical Communication Network

Rose was hired at DreamMedi eight years before my study for a temporary position to help a particular business unit "get caught up on their projects, like literature stuff that they didn't have time to do." At that point, Rose's work consisted mostly of creating catalogues and manuals about the product the unit specialized in. Even though the temporary position at DreamMedi did not match exactly her educational background in graphic design, Rose was happy with it because it allowed her "to take [her] time and do it well versus just getting it done," a big difference from her previous job. Rose's efforts did not go unnoticed—she managed to interest other actants in the TC network and

negotiate enrolment. As a result, Rose was offered a permanent position, working with DreamMedi's documentation in three languages.

After the introduction of CM-Master, Rose was not as successful in making new alliances with technology. Multiple organizational and technological limitations prevented Rose from making successful connections. Initially, she did not receive enough time to evaluate capabilities of various software packages in order to make sufficient arguments for a CMS that she perceived as the optimal solution for DreamMedi. In addition, financial pressures of the medium-sized business (CM-Master was one of the less expensive packages) overshadowed Rose's arguments that CM-Master "didn't have all its ducks in a row." Once the decision on CM-Master was made, learning publishing capabilities of the software—and Rose was the only stakeholder who needed this capability—became an impossible task. The literature on CM-Master was very extensive, organized by software capabilities, included many references that did not apply to Rose's work, and, according to Rose, required experience and familiarity with CM. An implementation specialist who came from the vendor to help DreamMedi for the first month produced "fake documents with fake data." When he left and Rose started working with "the real stuff," she felt like CM-Master was a waste of her time. According to Rose, hiring an independent CM-Master consultant proved to be of not much help either. The consultant spent a week at DreamMedi during which he worked 10-hour days to help Rose develop better strategies for working with CM-Master's publisher. Rose recalled that she initially thought that she didn't know enough about the software, so an expert would definitely "set things straight." However, she soon became disappointed, as she felt that she was the one doing the teaching. The consultant had to leave after a week, but

was keeping in touch with Rose to see if he could help solve her problems remotely. Rose appreciated his feedback, but her usual duties prevented her from spending much more time figuring out CM-Master's publishing tool. Rose wondered if the time she spent demystifying the software was really worth it; she wondered if she should rather wait until the new versions of the software would become more usable for her particular tasks (and the company's needs) and more user-friendly for her as a writer. The help offered through the software vendor was not satisfactory either: every time the international unit filed a query, they would be redirected to CM-Master training, which would take them, yet again, through all the capabilities of the software.

While Rose was using chunks of content to create print documentation, she continued relying on InDesign, fitting the new approaches into the old framework. Rose continued to interact with Melissa and Kelly, who generally described Rose's work as "helping us with print documents." They perceived Rose's work as focused primarily on DTP rather than creation of technical texts. While both Melissa and Kelly mentioned that Rose was not working with CM-Master's publishing tool because it wasn't flexible, none of them was aware of the reasons that flexibility was so important to Rose (Rose questions the necessity to simplify and rigidify genre characteristics of technical texts at DreamMedi for the sake of making software work). Rose continues communicating with DreamMedi's employees outside of the international unit, but this has been a one-way communication of Rose making inquiring about product details. None of the multilingual quality stakeholders (or in fact none of the participants I interviewed) outside of the international unit mentioned Rose or could describe what her expertise was.

While organizational and technological pressures prevented Rose from strengthening her immediate network by making alliances with new technology and new genres, her new positioning in the intermediated network of global TC was not favorable for making connections with multilingual quality stakeholders. She was not involved in multilingual quality assurance conversations between stakeholders (however scarce) and was not aware of the efforts and challenges of individual stakeholders. Rose instead implemented changes once Melissa told her about changes in translations. Since Rose's role in multilingual quality assurance was very limited, she could not enroll technical translators, localization advocates, or end-users into her immediate network.

Rose's alliances in her immediate network were Melissa, Kelly, chunks of content, print documentation, and InDesign (see Figure 15). The small number of alliances led to her network becoming less durable from the perspective of global TC at DreamMedi. Note that after my study was already complete, I received news from Rose that she was being transferred out of the international unit to work on print documentation for DreamMedi's contractor who wasn't using CM.

Melissa: Mobilizing Content Management Technology

Melissa joined DreamMedi five years before my study. She started in the sales department, where she was answering phone calls and emails from sales representatives and customers and managing orders. Three years later she felt that it was time for a change, because her tasks did not seem challenging any more. Relying on her experience with the product line of DreamMedi, she advocated for her capabilities in creating and managing the database of chunks of content in the newly acquired CM-Master.

In her new network of global TC, Melissa managed not only to enroll the new technology and the new genre, but to mobilize her new allies as a way of strengthening her immediate network. Even though Melissa did not have much background in TC and was not familiar with CM-Master, she approached the new role and the new software with enthusiasm. Her philosophy was "'learning as I go rather than spending a lot of time being trained on a new program." While Melissa did not discount the disadvantages of CM-Master (e.g., usability issues of the software), she consistently stressed that CM-Master's biggest advantage was the possibility to consolidate verified information that helped avoid wasted time DreamMedi's employees had to spend on figuring out what information is correct. Melissa's clear explanations of the benefits of CM-Master allowed this alliance to start enrolling new actants into Melissa's immediate network. When questions arose about the accuracy of information in engineering units or marketing groups of DreamMedi, people called Melissa and asked her to check CM-Master and clear up any inconsistencies or disagreements. Melissa as an actor became very powerful, as her network grew and she secured the durability of these ties. For example, Marco consistently mentioned Melissa as an important contributor to global TC and Melissa's managers thought of her as a CM-Master expert when they directed me in the beginning of my study.

In addition, Melissa managed to establish connections within the international unit, even though she did not participate in creating print documentation or (at least directly) the online sales system. Both Rose and Kelly relied on Melissa for ensuring the quality of information in the CM-Master. They both mentioned Melissa's familiarity with the product lines at DreamMedi and her experience as a product specialist. Melissa was also

connected to the print documentation and the desktop sales system, since these were her main sources for content mining.

While Melissa was a very powerful actant in the network of TC at DreamMedi, she was caught in a network of her immediate alliances: within the organizational structures and with her daily tasks she did not get an opportunity to make connections to the end-users, connections that are critical for multilingual quality. She received one-way feedback from the localization advocates about the changes to technical texts; Melissa than informed Rose of the changes in print documentation and implemented the changes to the chunks of content in CM-Master. Her role was a manager of content rather than a leader in the multilingual information development and multilingual quality. Indeed, bilingual reviewers/localization stakeholders asked her to verify information and to make updates to translated content; they did not communicate with her about their approaches to including users' opinions into the design of technical documentation. At the same time, Melissa was enrolling technical translators into the network and transforming their work through the reliance on the chunks of content, but this connection was one way again—Melissa was not involved in making the decisions about quality assurance that translators had to make now that they had to rely on the contextless and functionless chunks of content. Melissa's reliance on the CM-Master database prevented her from considering the challenges of quality assurance that individual technical translators faced.

Kelly: Mobilizing Content Management Technology and Co-workers

Kelly was hired right out of college three years before the study. Her major had been digital media development (a major within the department of computer information

sciences), which, as Kelly mentioned, had always been her hobby. Kelly was able to make alliances with DreamMedi's technologies, such as CM-Master, and, in fact, create new technologies that became her strongest allies.

While Kelly was unfamiliar with CM-Master before taking a position at DreamMedi, she relied on her "fellow co-workers, reading online documentation, and practicing" to get comfortable with the software. Kelly noted that CM-Master might not have been the best choice, but she agreed that the system "helps keep data consistent and provides a central place for maintenance." She didn't see the limitations of CM-Master as unbearable obstacles to her work—she adapted the software to fit her needs.

Kelly had been hired to create an online sales system that would imitate the capabilities of the desktop sales system but would rely on the CM-Master database as a source of multilingual content. Since CM-Master software package did not provide a sufficient solution to enable end-user configuration of DreamMedi's products online, Kelly created a midware application that allowed her to do just that. While Kelly was not completely happy with the foreign language capabilities of CM-Master, she continuously looked for ways to improve them, as well as kept investigating alternate solutions on the market—something that only she devoted her time to within the international unit.

As a result, Kelly was perceived as the person with most ideas for change and improvement and as technology guru outside of the international unit. Kelly was also consistently invited to IT and management meetings; at those meetings, she showcased her recent work to improve the technological solutions at DreamMedi and described the problems that current technologies could bring to the success of global TC. Kelly's power

as an actor grew as her new ideas established the durability of her network. Kelly was mobilizing not only the technology, but other human actants within DreamMedi as advocates of her importance and expertise.

However, similar to Melissa, Kelly's intermediated immediate network prevented her from establishing critical connections with translators and enrolling localization advocates as mediators of her relations with end-users. She was viewed as the technology guru rather than as a leader of multilingual information development outside of her department. Bilingual reviewers/localization stakeholders referred to Kelly to make changes to the multilingual content that the online sales system drew upon, but they did not communicate with her about their approaches to including users' opinions into the design of technical documentation. The problems with the practices of multilingual quality exacerbated or introduced by CM-Master, however, did not go unnoticed by Kelly. She saw some of the potential and real problems of working with chunks and started considering a unit-wide and a company-wide discussion of quality in global TC with CM.

Mediating and Negotiating Leadership Opportunities

There are some important lessons to be learned from the descriptions of the immediate actor-networks of Rose, Melissa, and Kelly. Rose was wary of CM-Master; she had strong opinions on what the software offers versus what the documentation should look like and did not want to change to fit the new technology. Melissa was very vocal about the quality of information in CM-Master and became an "information nexus"—somebody employees of the company asked when they needed to verify information.

Kelly attended many meetings to discuss the future of CM-Master and the online sales system. She constantly generated new ideas about how to make software better and was capable of writing her own code to adopt the CM software for her needs. Rose's position in the intermediated global TC network above was definitely the weakest, since she had the fewest connections. While Melissa was rather successful in making her role visible, her approach was too dependent on a particular technology. Kelly was the stakeholder from the international unit whose competencies were most visible with the company, because she took a critical and creative stance towards CM.

In the context of global TC with CM at DreamMedi, some stakeholders of the international unit struggled "with the kinds of uses, and even workplace writer roles, that the CMS suggested" (McCarthy et al, 2011, p. 388), while others were more successful in enrolling the technology, the new genre (chunks of content), and other human actors into their networks. If TC stakeholders want to be in the position to start conversations about contextualized multiple-stakeholder quality approaches and become managers of multilingual quality and leaders of global information development, they need to make their tasks and competencies more visible within their organizations. In the context of DreamMedi, visibility of the TC stakeholders was connected to the following strategies:

- *Mobilizing new genre and technology*

  Russell notes that genres come to "fully mediate human interactions in such a way that some people (and some tools) have greater and lesser influence than others because of their dynamic position(s) in tool-mediated systems or networks." Amare (2009) has discussed the power of content management to effect changes in writers'

roles within an organization. By enrolling both CM-Master technology and chunks-as-genre, Kelly and Melissa manage to make their roles more visible.

- *Mobilizing other employees*

By constantly communicating with employees outside of the international unit and being able to clearly state the benefits of her actions for the company as a whole, Kelly manages to become an irreplaceable actor in DreamMedi's TC. However, technical communicators at DreamMedi also need to mobilize bilingual reviewers/localization advocates and technical translation; they need to let their own network be transformed through the mediation of technical translators and localization advocates.

Spinuzzi notes that "most yield" comes from networks in which "every node is connected to every other" (http://spinuzzi.blogspot.com/2009/07/what-if-i-had-called-them-genre.html). According to Spinuzzi, more interconnections allow easier rerouting around a node, achieving localized efficiencies, minimizing steps in communication, pushing power to the edge, and "delegating discretion to more localized levels, resulting in faster reaction time." In DreamMedi's TC this interconnectedness would mean that all multilingual quality stakeholders have the shared awareness of what multilingual quality entails, work on constant re-negotiation of this awareness, and can take actions in their everyday work based on the awareness (i.e. without having to constantly solve single-case problems as they appear). Spinuzzi, however, also states that interconnectedness "comes at a price: more connections and more communication yield a higher information processing load, so nodes must be able to adapt to that load." For multilingual quality

> stakeholders, this adaptation means relating the shared awareness to their everyday practices; I argue that this adaptation can only happen through joint responsibility and negotiation by all multilingual quality stakeholders.

Technical communicators operate in the context of distributed work where work practices are ‘‘coordinative, polycontextual, [and] crossdisciplinary (…) splic[ing] together divergent work activities (…) that enable the transformations of information and texts that characterize such work’’ (Spinuzzi, 2007, p. 266). According to Spinuzzi, distributed work does not rely on stable settings and clearly defined roles and relationships. Technical communicators who operate in distributed work contexts need to constantly re-negotiate their roles, since it’s not possible to determine identities nice and neatly, once and for all (Swarts, 2010). For example, Rose originally was able to establish her position within DreamMedi by taking a flexible approach to learning software and processes. However, she failed to renegotiate her position in a favorable way after the introduction of CM-Master.

While managing multilingual quality is an excellent way for technical communicators to showcase their competencies and become global information development leaders (and technical communicators have many necessary skills for this work, such as, for instance, understanding of audience analysis and experience with CM), it is unrealistic to expect that all technical communicators have leadership potential and/or are interested in becoming leaders. Determining who could take the responsibility of leading efforts in creating contextualized multiple-stakeholder approaches to multilingual quality would, of course, depend on specific contexts of particular workplaces. For example, at DreamMedi bilingual reviewers such as Marco have the potential of arguing for dedicating more

resources to multilingual quality efforts. Most important here is that— regardless of who leads these efforts—voices of all stakeholders are taken into account.

CHAPTER 4: CONCLUSIONS

This chapter concludes the discussion of my case study of multilingual quality and CM. My qualifications to conduct this cases study developed from my personal experiences as a technical translator, translation project manager, and technical communicator; the exigencies for the study arose from multiple discussions with colleagues who are practitioners and scholars in TC and technical translation, as well as a careful overview of TC and technical translation discourse, both scholarly and practitioner. These exigencies directed me in the research design and methodology of my study and helped me formulate the main goal of my project: to theorize multilingual quality in CM contexts by uniting scholarly and practitioner discourses in TC and technical translation on CM and quality. This goal grounded in the theoretical constructs of my study and literature review led to three major research questions:

- **How** and **why** does adoption of CM challenge global TC practices?
- **How** do multilingual quality stakeholders approach quality of multilingual technical texts produced with CM? **Why** do they do it this way?
- **How** do the changes in multilingual TC brought by CM and the stakeholders' approaches to multilingual quality influence the roles of TC stakeholders within workplace contexts?

Below is the summary of my findings that answer these research questions.

SUMMARY OF RESEARCH FINDINGS

In this study I used a combination of four theoretical perspectives (genre ecology framework, activity theory, actor network theory, and Skopos theory) as lenses for studying multilingual quality and CM in a workplace context. These lenses allowed me to answer my research questions by examining tensions and contradictions in multilingual quality understandings and practices of the stakeholders.

- *How and why does adoption of CM challenge global TC practices?*

  With the adoption of CM global TC stakeholders at DreamMedi were separated into three groups, with each group functioning in its respective genre ecology. Such separation challenged global TC practices because these groups of stakeholders had different levels of awareness about the complexities of formal written genres of global TC at DreamMedi and did not have a clear picture of the problems the meditational work of the new genre, chunks of information, introduced to the genre ecologies of other stakeholders. As the stories of Rose, Melissa, and Kelly (TC stakeholders of the international unit) showed, these three stakeholders were aware of the complexities of formal written genres of global TC at DreamMedi through their collaboration and co-mediation of the new genre, chunks of content. However, these three stakeholders were not aware of the problems their new technical translation work processes brought to the genre ecology of technical translators. After the implementation of CM strategies and technologies, technical translators were working in chunks-only genre ecology and were not able to make Skopos-defined decisions that were critical to multilingual quality. The story of David (freelance translator for Spanish) illustrated that in addition to genre ecology

challenges, there was a very real risk of DreamMedi losing expertise: David shifted from complaining about the new practices, to stopping his complaints for fear of creating an unfavorable image of his expertise, to considering discontinuation of business with DreamMedi. The stories of bilingual reviewers, Marco, Tammy, and Alex, showcased yet another challenge. These stakeholders did not know about the complexities of the new genre, chunks of content; as a result, they saw the role of the international unit as fast creation of consistent texts in three languages.

- *How do multilingual quality stakeholders approach quality of multilingual technical texts produced with CM? Why do they do it this way?*

In the context of DreamMedi, there were three groups of multilingual quality stakeholders: TC stakeholders of the international unit, technical translators, and bilingual reviewers/localization advocates. All stakeholders had very different understandings of and approaches to multilingual quality; these approaches were related to their experience, their field of knowledge, their access to end-users, their relation to other units of the company, etc. What is most important here is that these different understandings and approaches were not discussed—a situation that led to "circles of ambiguity" (c.f. Spilka, 2000; Schriver, 1993) around the definitions of multilingual quality at DreamMedi and to all stakeholders solving their separate issues as they appeared without an overview of the overall process of global TC.

CM improved multilingual quality based on the understandings of quality as consistency and accuracy, which were values shared by stakeholders. However, whenever there were original differences in the understandings of and approaches to

multilingual quality, CM aggravated these differences and did not contribute to improving multilingual quality. For example, technical translators were not able to follow their understanding of quality as adaptation based on end-user characteristics because chunks did not provide them enough information for making Skopos-based decisions. In fact, David was working against technical translation best practices and the experience David acquired during his seven years of collaboration with DreamMedi. Bilingual reviewers/localization advocates were either implementing or thinking about localization, but they did not communicate about their ideas with the international unit.

- *How do the changes in multilingual TC brought by CM and the stakeholders' approaches to multilingual quality influence the roles of TC stakeholders within workplace contexts?*

Through the lens of ANT I explored the positions of the three TC stakeholders of the international unit at DreamMedi as they were forming alliances with CM technology, genres, and other employees. This exploration shed light on how the roles of these stakeholders were changing based on their stances towards CM strategies and technologies and their involvement with technical translation and multilingual quality management. This exploration also helped me to conceptualize the factors that made the expertise and tasks of some of these stakeholders more visible than for other stakeholders.

As the individual stories of Rose, Melissa, and Kelly viewed through the lens of ANT illustrated, TC stakeholders who were able to continuously re-negotiate their

roles in connection to new technology and who were communicating with employees outside of their immediate network earned the most respect for their skills and competencies within the organization. However, I also found that the international unit as a whole was not engaging with the understandings of and approaches to multilingual quality of other stakeholders. Not only was this situation decreasing the visibility of the expertise of the international unit, it also prevented knowledge sharing between the bilingual reviewers/localization advocates. In fact, through interviews and observations I discovered that there were more employees at DreamMedi who were toying with ideas of country- or region-specific adaptation of technical texts.

While GEF, AT, ANT, and Skopos theory allowed me to answer my primary research questions, the combination of these lenses also revealed additional valuable information. Through the concept of primary and secondary contradictions in the activity system and the zone of proximal development of the activity theory, I theorized possible strategies for demystifying the "circles of ambiguity" around the idea of multilingual quality in this particular workplace context. As a result, I was able to outline specific questions that DreamMedi could use to generate a discussion of multilingual quality and to improve their current practices. Through ANT's concept of translation as making alliances to form a network, I was able to show that managing multilingual quality can be an excellent opportunity for technical communicators to show their value added and even take leadership roles in global information development, should they be interested in leadership. Such leadership could become a critical factor in securing the user-centered culturally-aware rhetoric in CM-technology-enabled global TC.

It is also important to note that the goal of my analysis was not just to criticize current practices in the workplace I studied, but rather to outline opportunities for collaboration in improving approaches to multilingual quality management in global TC with CM. In a confidential report that I provided to DreamMedi after my study was complete, I described my critiques and provided recommendations for enhancing multilingual quality practices. My analysis is, however, based on one particular context, and this fact needs to be considered when attempting to generalize the results to the field of TC. So, what does this analysis mean for research/theory, practice, pedagogy in TC? What can we learn from it as a field of study and a profession? In what follows will address these questions.

IMPLICATIONS FOR PRACTICE, PEDAGOGY, AND RESEARCH IN TECHNICAL COMMUNICATION

While my presentations and multiple discussions with TC practitioners point to certain similarities of DreamMedi's context to multilingual CM practices in other organizations, my analysis is limited to a particular workplace context. The activities in this context are situated within a single organization and bound by its structure and work practices. Hence, other contexts can produce different results and generalizing outcomes of this project or providing prescriptive models of multilingual CM is not my goal. However, this project has important implications for TC practice, pedagogy, and research; I will I summarize such implications in this section.

Enriching Technical Communication Practice

My study showed that today, when TC is becoming an increasingly global, multilingual, multicultural, dispersed, and CM-defined practice, it is more important than ever to think

about what quality means for a particular workplace. A critical part of achieving multilingual quality of technical texts is identifying and including all stakeholders into a dialogue and addressing the questions of CM and organizational goals and practices in this dialogue; my project also illustrated the perils of relying on individual understandings of and approaches to multilingual quality. As part of my analysis of multilingual quality at DreamMedi, I outlined strategies for organizing such a dialogue and provided sample questions to guide it. While these questions were tailored for DreamMedi, they can be easily adapted for other workplace contexts.

In addition, my study demonstrated that technical communicators are ideally positioned to take leadership roles in multilingual quality management dialogues, should they be interested in leadership opportunities. Among all multilingual quality stakeholders technical communicators are the ones who can rely on their knowledge of CM, expertise with audience analysis and usability strategies, and positions between technical translators and bilingual in-house reviewers to start a company-wide dialogue I described above and to unite multiple variables of quality important for a particular organization. Engaging in such leadership, I argue, could not only be important for their particular positions and context, but also increase the value added of the profession in general.

Expanding Approaches to Teaching Content Management

Today, while the field of TC is discussing the best ways of learning CM (e.g., university courses, vendor seminars, books, conferences, blogs, forums, best practices, journals), CM is slowly finding its way into curricula of TC programs. In academic publications and conference presentations, TC educators often wonder what we should teach to the

new generation of technical communicators about CM. While the results of my case study cannot be generalized, they clearly show what skills and competencies were helpful to the three technical communicators in the international unit. Some of these skills and competencies related to the ability to learn a new technology; others described the ways technical communicators approached change and leadership. Here is a list of the skills and competencies that need to be addressed in courses that deal with CM to give TC graduates the necessary strategies to think about multilingual quality and to take leadership roles in global information development:

- *Global audience analysis*

  While audience is a critical topic for many TC courses, it is particularly important for teaching CM. Not only does CM provide possibilities for adapting texts for multiple audiences in English, it also allows assembling texts differently for different audience groups in different languages. In such a way, CM can become an excellent tool for localization—provided we spend sufficient time on audience analysis for reader groups in languages other than English and create information models for these groups following the results of this analysis rather than duplicating English for the US models. To develop such global audience analysis strategies, technical communicators need to involve technical translators and any stakeholders within their workplaces into the early stages of content creation and text development. Learning how to approach global audience analysis and how to show its value to multilingual quality stakeholders is an important competency that TC students need to start developing while they take CM classes.

One way to approach developing global audience analysis competence is collaborating with students from technical translation and TC programs in the US and abroad. Maylath et al. (2013) describe such a project. The main goal for students is to learn how to manage complexity in TC workplaces, where documents are authored, translated, localized, tested in multiple languages at the same time. However, one of the prerequisites to managing complexity, according to Maylath et al., is for students "to learn to analyze users of target languages and to revise their documents with these users in mind, with the help of feedback from usability testers and translators in the target locales and language" (p. 70).

Furthermore, global audience analysis can encourage students to see multilingual TC not just as an area with many issues, but also with many opportunities. By involving multiple stakeholders into global analysis and quality discussion, technical communicators can create potentially very creative teams if they learn how to manage differences in a dynamic group.

- *Working knowledge of XML*

To implement the results of global audience analysis, technical communicators need to know how to create various information models and how to adapt the software to serve their needs of localizing texts for global audiences. In my study, Kelly was an example of a technical communicator who took the initiative to learn and stay up to date with the software. While Kelly did not know CM before she started working at DreamMedi, she managed to learn the software to the degree that allowed her to be comfortable adapting it to her specific needs. To do so, she relied on her background

knowledge of XML. While technical communicators in my case study were capable of learning CM approaches comparatively fast because they could rely on their TC rhetorical skills and their in-depth knowledge of DreamMedi's products and genres, they did not feel comfortable with the software if they couldn't customize it.

Arguably, it is unrealistic to ask all TC programs to help their students become as proficient in XML as computer science majors. However, we cannot disregard the advantages familiarity with XML could give to TC students through eliminating the fear of ineptness when being put on the spot. XML offers a multitude of capabilities, and its uses are always connected with tasks and project characteristics. Thus, XML could become part of a project-based course where students would "learn how to learn" specific capabilities necessary to achieve a certain goal.

- *Critical approaches to technology and clear articulation of advantages and disadvantages of a particular software from rhetorical and financial perspectives*

Learning XML is also a helpful step on the road of taking critical approaches to CM—being able to evaluate the pros and cons of CM approach in general and of specific software packages offered by various vendors. In my case study, technical communicators' ability to articulate the advantages and disadvantages of the particular CM software largely contributed to their positions within their workplace context and their influence on future software choices. While one technical communicator only concentrated on how CM could contribute to her individual work practices, another communicator focused on rhetorical (e.g., technical translators cannot translate well if translation is given out of context) and financial (e.g., if technical translators cannot translate well, readers will have less trust in the product

and international unit would have to spend much more time "fixing" the translations) implications of the software. As a result, this communicator, Kelly, was able to conceptualize a dialogue within the company about the software and overall approaches to multilingual CM.

In the TC literature pieces of advice on advocating for the implementation of a CMS usually circle around describing ROI to the management. I argue, however, that this advice needs to be supplemented by two additional points. First, technical communicators need to be able to articulate why their company should be implementing a certain CMS and not any other and argue smartly for the one they want. Second, technical communicators need to be able to articulate their opinions on a very short time frame. When the push to implement a CMS comes from the management, technical communicators have very little time to prepare.

In designing classes on CM, TC educators need to provide students with sufficient "playing ground" to try various types of CM software and engage students in explicit comparative analysis of such characteristics of CM and CMS as learning curve, adaptability, flexibility, time saving (versus single-sourcing without a CMS), ease to share with contractors and dispersed teams, translation integration, localization possibilities, etc. This approach will allow students to feel more comfortable when tasked with learning and expressing opinions about CM. Even more importantly, this approach will give students the competency of connecting their rhetorical analysis of a CMS with financial outcomes of implementing such a system—an important skill in organizational contexts.

- *Leadership and project management*

In global contexts, leadership and project management skills for technical communicators include flexibility, negotiation and collaboration approaches, and problem solving. Artemeva and Freedman (2001) argue that TC students must learn that "organizational sites change in response to a range of internal and external pressures. (…) Flexibility and responsiveness to rhetorical context must be encouraged by whatever means teachers have at their disposal" (p. 193). For working with CM, such flexibility is paramount. However, flexibility does not mean blindly accepting new technology or adapting rhetorical strategies based on software limitations. This flexibility means learning something new by capitalizing on knowledge and previous experiences—CM without reliance on rhetorical skills and knowledge of the audience cannot be successful. Another part of this flexibility is collaborating with translators in a completely new paradigm, where translators work without what Maylath et al. call "critical context information about the text, such as description of the intended audience and situations in which the text would likely be read" (2013, p. 72). In such a way, technical communicators and translators need to show signs of empathy not only with the readers, but also with one another (Mousten et al., 2012).

In addition, this flexibility is manifested in everyday negotiations that technical communicators need to learn how to conduct. These negotiations and flexibility involve allowing opinions of other stakeholders to influence their practices while following their tactic and strategic goals. The main focus of these negotiations, I argue, is finding the most useful approach to quality that could encompass expertise

of multiple stakeholders holding various positions within the company, situated in various geographic regions, and having different professions and backgrounds. These negotiations also include making these approaches available and understandable to all stakeholders.

Busstra (2007) notes that shared understanding can be created only through dialogue. I argue that it is the task of technical communicators to take a leading role in this dialogue. Through this dialogue technical communicators can also ascertain their leadership positions by focusing on the value-added of multilingual quality and showing how good rhetorical practices not only allow technical communicators to stay true to the humanistic commitment to the readers, but also have very real financial implications for organizations (e.g., creating non-user-friendly technical texts in multiple languages would mean spending additional resources on help or re-working the texts from the beginning).

In TC courses, this dedication to flexibility, negotiation, and leadership could be enhanced, for instance, by collaborative group projects with students from other departments and programs, ideally also located overseas, and encouraging students to reflect on their roles in these projects. Such projects can help students achieve what Matveeva (2008) calls the main aim of TC education: "considering the humanistic value of multicultural education, the overall goal of intercultural teaching in technical writing is for students to develop basic skills and knowledge that allow them to negotiate ethically and efficiently across cultures" (p. 406).

Critiquing, Theorizing, and Innovating Content Management in Technical Communication Research

At the 2013 conference of the Association of Teachers of Technical Writing, Sharp presented evidence that while industry leaders are continuously discussing CM (e.g., costs of a CMS, savings from a CMS, newest software packages), academics have decreased their participation in CM conversations since 2008. He argued that it is critical for TC researchers to *critique* CM strategies and technologies in order to compare their promise with their actual results; to *theorize* CM to discover its relations to rhetoric; and to *innovate* in CM practices to establish a place of influence of academy in the future of TC. Through a case study of a TC workplace my project answered this call for research.

- *Understanding CM as a rhetorical, social, and political component of multilingual TC*

  As my study showed, CM strategies and technologies have very complex implications for the practices of multilingual TC. My study questions the axiom "CM is good for translation/localization" and provides examples that showcase that it is rather dangerous to think of CM only as a way to improve translation and localization practices. While CM does have unquestionable advantages, such as improving consistency of translated texts, it can also limit the understanding of and approaches to multilingual quality.

  My study illustrates the danger of relying on CM technology for achieving multilingual quality by including translation/localization discourse into CM discourse. TC scholars have long advocated the importance of conducting more

research on multilingual TC and translation/localization (c.f. Hayhoe, 2006; Kim at el., 2008; St.Amant & Rife, 2010: St.Germaine-Madison, 2006). However, in the CM academic discussion this call for research has not yet been realized. My study provides the first insights into the complexities of managing multilingual quality with CM. It also shows that accepting the fact that CM is good for translation presupposes that pre-CM writing and translation practices were bad, and post-CM technical communicators will follow good practices. However, my study suggests that this is not necessarily true. For instance, David (technical translator) is distancing himself from his localization strategies in order to keep working for DreamMedi, a big disadvantage for the rhetoric of multilingual technical texts of the company. A careful analysis of pre-CM multilingual TC practices is necessary in order to strategize the best rhetorical approaches for a particular context.

- *Arguing for contextualized multiple-stakeholder definitions of quality in multilingual CM*

By showcasing the perils of narrow definitions of quality imposed by organizational limitations, my project helps to promote contextualized multiple stakeholder definitions of quality. Castells (1996) argues that performance of networks depends on "two fundamental attributes of the network: its connectedness, that is, its structural ability to facilitate noise-free communication between its components; and its consistency, that is, the extent to which there is a sharing of interests" (p. 187). In a multilingual TC network, technical communicators need to ensure that multiple quality stakeholders are making this network connected through constant communication. Technical communicators also need to learn how to develop

approaches to multilingual quality that include all perspectives and expertise, making the interests of stakeholders shared. For different workplace contexts the priorities in quality practices might be different, but it is critical to have an understanding shared between all quality stakeholders of what they are prioritizing and why. In the context of my research project, lack of connectedness and shared awareness resulted in the risk of losing valuable expertise (David considering stopping his work for DreamMedi), limiting expertise sharing (DreamMedi-China not knowing about localization efforts of Marco or business unit 1), and undercutting the roles of technical communicators as leaders of global information development. Leadership of technical communicators in multilingual quality management is essential for what Thatcher (2010a) calls "humility, reflexivity, and flexibility" in global TC (p. 7).

- *Situating multilingual quality management as knowledge work*

My analysis uncovers exigencies for technical communicators to participate in multilingual quality management: by becoming deeply involved in the discussions of quality and quality assurance, technical communicators can move from the production-centered software-bound workers to knowledge-centered roles of global information development leaders. Hart-Davidson (2010) uses the concept of gardeners introduced by Nardi and O'Day (1999) to describe the work of technical communicators as making continuous improvements to the workplace. As gardeners or knowledge-workers, technical communicators "take on supervisory roles at the level of a team, a project, a critical business process, or the organization as a whole. They study how people work to create and manage information and they then look to make improvements. They document practices, specify standards, and invent new

tools. Their work produces metrics for evaluating critical processes to their organizations, materials used to train new workers, and even new work environments" (Hart-Davidson, 2010, p.138).

- *Developing theoretical frameworks for analyzing multilingual quality and CM*

By observing workplace practices and using concepts from the genre ecology framework, AT, ANT, and Skopos theory, I was able to analyze multilingual CM quality at DreamMedi through genres and actions that reflect the stakeholders' workplace community. This framework allows me to examine multilingual quality on three levels. On a macro level, AT differentiates between short-lived goal-directed actions of the multilingual quality stakeholders and a durable, object-oriented activity system that is embedded into its particular organizational context. It provides a mechanism for "expansive visibilization"—"a powerful intervention methodology for dealing with major transformations of work" that focuses on the developmental dimension of work activity (Engeström, 1999, p. 63). On a meso-level, the genre ecology framework provides language for analyzing how chunks of content as a genre mediate collective changes in writing and translation practices and how the changes in these practices create contradictions between genre ecologies of the multilingual quality stakeholders. Skopos theory advances the analysis of the causes of these contradictions by including cross-disciplinary knowledge. On the micro level, ANT provides a theoretical lens for examining how technical communicators' relation to new genres and CM technology influences their participation in multilingual quality, visibility of their work, and their roles within the organization. As a result, the hybrid framework proves to be an insightful

> mechanism for creating a comprehensive picture of complex interactions of quality stakeholders, writing technologies, and TC genres; it fulfills the responsibility of TC researchers to support "the evolving practice of writing" and account for the "fluid and community-driven nature of workplace writing" (McCarthy et al., 2011, p. 391).

To participate in the conversation on CM and to safeguard broad rhetorical definitions of multilingual quality, TC scholars need to conduct more studies of multilingual CM in various organizational contexts. By establishing patterns of regularity and gaining additional insights not reflected in this research project, TC scholars can establish the roles of researchers in workplace contexts as the engines of change. Then, TC scholars will have the opportunity to participate in CM innovation by applying human values to the development of writing practices with technologies or "using technology with heart'' (Nardi and O'Day, 1999, pp. 211-212).

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APPENDIX: REPRESENTATIVE INTERVIEW QUESTIONS AND QUESTIONNAIRES (MELISSA)

Probing Questionnaire

1. What is your job title? How did you become a [your job title]? How many years have you been with DreamMedi?
2. How would you describe your typical work day? What do you find to be the most exciting and the most difficult part of your workday?
3. What types of texts do you create and who are the readers of these texts?
4. What are your usual tasks related to CM-Master?
5. What are your usual tasks related to technical translation?

Interview 1

1. What software do you use to create technical texts?
2. How do you use CM-Master? (Describe your standard procedures for working with CM-Master.) How do you know when new information needs to be added to CM-Master?
3. How did you learn to work with CM-Master?
4. Are you happy with CM-Master? How do you see the benefits/disadvantages of CM-Master?
5. Who else uses CM-Master except for you and how/for what purposes?
6. Have you worked in the company before CM-Master was introduced? How were your work processes different from/similar to the processes now?
7. What about translation: were there any changes to how you approach translation once you started using CM-Master?
8. Do you translate in-house or do you outsource? (Describe your standard procedures for working with a translation project.)
9. Who else participates in translation and how/why?
10. How did you pick your technical translation vendors and why?
11. Are your translators using CAT? Why yes/no? What kind?

12. How often do you communicate with people from other departments/units? Who are these people? What do you communicate about?
13. Does DreamMedi have a technical communication style guide? Why yes/no?
14. Based on our conversation, is there anything I should be asking that I don't know to be asking about CM-Master, your writing practices, technical translation?

Follow-up Questionnaire for Interview 1

1. Where do you take content for CM-Master? Why?
2. How do you know a text you create with CM-Master is good?
3. How do you make sure translated texts are good?
4. Are all documents you create intended for future translation? Do you create text not intended for future translation differently from the text created for future translation?
5. How do you review complete texts (in English, Spanish, Simplified Chinese)?
6. Is there anything you remembered since the interview about any questions we discussed?

Interview 2

1. How did you learn/decide to follow translation processes that you're following now?
2. How do you make sure that the translated documents meet the quality standards? What are your quality standards for translation?
3. How would you define a "good quality" text?
4. How would you define a "good quality" translated text?
5. How do you differentiate translation from localization?
6. Do you do usability testing for the documents created in your unit (e.g., ask the readers of manuals and catalogues what they think about the information)?
7. What are the benefits/disadvantages of the current translation processes that you follow?

8. How does your unit keep information consistent between different text genres (catalogues, manuals, online sales system, etc)? What about Spanish and Simplified Chinese?
9. How does CM-Master contribute to your translation processes?
10. Who is responsible for translations in your unit? What do you contribute? What do other employees of your unit contribute?
11. How often do you think you re-translate content that has been translated before?
12. Are there ever any complaints about the quality of technical texts you produce in English, Spanish, and Simplified Chinese? If yes, please describe.
13. How many different types of software do you use in your every-day work? How did you learn them? How comfortable/happy do you feel with them?
14. Based on our conversation, is there anything I should be asking that I don't know to be asking?

Follow-up Questionnaire for Interview 2

1. How do you distinguish technical documentation from marketing documentation? Give an example.
2. How do you implement changes suggested by bilingual reviewers?
3. Does DreamMedi ever need any other foreign languages, apart from Spanish and Simplified Chinese?
4. Do you participate in creating content for the website? Who translated the website?
5. Is there anything you remembered since the interview about any questions we discussed?

Closing Questionnaire

1. As of today, do you have the feeling that CM-Master was the best software choice for your needs? Why yes/no?

2. How would you describe ideal capabilities of a CM software package (for writing in English and translation)? How would this ideal software influence your work and the texts you create in several languages?
3. Is there anything else you think would be interesting for me to know about writing and translation practices or about software you use for writing and translation?

TATIANA BATOVA

CURRICULUM VITAE

EDUCATION

Ph.D. in English (emphasis in Professional and Technical Writing), University of Wisconsin-Milwaukee, May 2013
Dissertation: "Global Technical Communication and Content Management : A Study of Multilingual Quality"
Dissertation Committee: Dave Clark (chair), Rachel Spilka, Gerald Alred, Dennis Lynch, Scott Graham

M.A. in Foreign Languages and Literature (German - English Translation), University of Wisconsin-Milwaukee, December 2005

M.A. and B.A. in German, English, and Foreign Language Pedagogy, Tula State Pedagogical University, Tula, Russia, June 2003
Magna cum laude

AWARDS

Dissertation Fellowship Award, UW-Milwaukee, 2012-2013

Association for Business Communication Graduate Student Travel Award, 2011

Frank R. Smith Outstanding Journal Article Award, Technical Communication, a journal of the Society for Technical Communication, 2010 (one article is selected each year in this flagship journal)

Graduate Student Travel Award, 2010, 2011, 2012, UW-Milwaukee

Chancellor's Graduate Student Fellowship, 2008-2009, UW-Milwaukee

GRANTS

University of Wisconsin-Stevens Point, School of Business and Economics, 2011 (Co-Investigator). "'Third Context' of Intercultural Communication: Developing Best Practices for Teaching Intercultural Business Communication Classes."

University of Wisconsin System, Office of Professional and Instructional Development, 2009-2010 (Co-Investigator). Undergraduate Teaching & Learning Grant: "Writing English for Non-native Speakers: Assessing and Developing Best Practices for Teaching Business Writing Students."

PUBLICATIONS

"Legal Literacy for Multilingual Technical Communication Projects." Chapter accepted for a peer-reviewed & edited collection Legal Issues in Global Contexts. Eds. Kirk St. Amant & Martine Courant Rife. Baywood Publishing (external peer review completed; contract pending; tentative publication date in 2014).

"Writing for the Participants of International Clinical Trials: Law, Ethics, and Culture," Technical Communication 57.3 (2010): 266-281 (Frank R. Smith Outstanding Journal Article Award).

"The Role of Technical Terms in Creating Humorous Effect in Fiction" (article in Russian language), Tula State Pedagogical University Research (2003): 249-253.

CONFERENCE PRESENTATIONS

"Content Management: New Gateways and Challenges of Technology in Transition" (panel presentation). Conference on College Composition and Communication, St.Louis, March 2012.

"International Technical Communication: Re-Considering Quality." Association of Teachers of Technical Writing, St.Louis, March 2012.

"'Third Context' of Intercultural Communication in Business Writing Classes." Association for Business Communication, Montreal, Oct. 2011.

"Positively Global: Editing the Work of Multilingual Writers." Society for Technical Communication, Sacramento, May 2011.

"Teaching Business Writing Students to Write for a Global Audience." Association for Business Communication, Chicago, Oct. 2010.

"Teaching Business Writers to Write for a Global Audience." University of Wisconsin System, President's Summit on Excellence in Teaching and Learning, Madison, April 2010.

"Business Writing Challenge: Bridging the Academic and Professional Words." University of Wisconsin System, President's Summit on Excellence in Teaching and Learning, Madison, April 2010.

"Content Management and the Realities of Translation." Association of Teachers of Technical Writing, Louisville, March 2010.

"The Public, the Private, and the Reflective: a Blogging Triptych" (co-authored presentation). UWM FYC Professional Development Conference, Creating, Composing, Curating: Converging Sites of Composition, Milwaukee, May 2009.

"Multimodality and New Media in the Composition Curriculum: Reinvigorating the Technique of Free Writing" (poster presentation). Annual Conference on Teaching First-Year Writing, University of Wisconsin-Milwaukee & Marquette University, Milwaukee, Dec. 2008.

"Cultural Aspects of Medical Interpreting." Annual Conference of Midwest Association of Translators and Interpreters, Beloit, Sept. 2007.

INVITED PRESENTATIONS

"Audience and Context in International Technical Communication." Guest lecturer for Theories in Business and Technical Writing (English 855), University of Wisconsin-Milwaukee, Oct. 2011.

"Business and Technical Communication in the U.S." Tewoo Metal International Trade Corp, international marketing department, Tianjin, China, June 2011.

"Content Management and Translation." Society for Technical Communication, Wisconsin Chapter meeting, Feb. 2011.

TEACHING

Seminar Instructor/Leader, Jan. - Feb. 2013, Seminar proposal approved by the Wisconsin School of Business (Custom Executive Education), University of Wisconsin-Stevens Point (School of Business and Economics), Aspirus Health System

Business Communication & Personal Leadership Effectiveness

- Introduces physicians transitioning into management roles to the concepts of effective business communication
- Prepares them to complete a group project, which is based on the needs of local health care providers

Teaching Assistant, Sept.2008 - May 2012, University of Wisconsin-Milwaukee (Department of English)

Business Writing (face-to-face and online)

- Teaches students the fundamentals of communicating effectively in business environments
- Prepares students to conduct rhetorical analyses of real/hypothetical business situations in their social, political, and ethical contexts
- Provides students an opportunity to practice their problem-solving skills while composing texts in the most common business genres

Technical Writing (online)

- Teaches students the fundamentals of communicating effectively in scientific and engineering contexts
- Prepares students to analyze and respond to different social, political, technological, cultural, and ethical contexts

- Provides students an opportunity to practice their problem-solving skills while composing texts in the most common genres of written technical communication

Introduction to College Writing

- Introduces first-year students to the basics of reflective inquiry and academic writing
- Helps students to develop complex composing strategies for responding to the concerns of others and to their own concerns

(Departments of English & Mechanical Engineering)

Introduction to Mechanical Engineering (communication elements lab)

- Facilitates the Engineering Communication objective of the class
- Helps freshman mechanical engineering students to gain experience in critically analyzing and presenting data, creating basic workplace documents, and making technical presentations

Adjunct Instructor, Jan. - May 2006, University of Wisconsin-Green Bay
(Department of Modern Languages)

German-English Translation
Advanced German Conversation and Composition
Second Semester German

Teaching Assistant, Sept.2003 - Dec. 2005, University of Wisconsin-Milwaukee
(Department of Foreign Languages and Literature)

First, Second, and Third Semester German
First and Second Semester Russian
Advanced Russian Reading and Conversation

ADDITIONAL EXPERIENCE

Assistant Editor, Sept.2010 – May 2013, Cream City Review, Milwaukee, WI

- Evaluating submissions for the student-run literary journal

Freelance Multilingual Technical Communicator & Consultant, Jan.2005 - present

- Writing, editing, and translating for automotive field (user manuals, patents, etc.) and medical field (clinical study documentation, medical equipment manuals, etc.)
- Interpreting (onsite & phone)
- Localizing websites
- Providing training in translation/localization project organization

AP Grader, June 2012, ETS, Louisville, KY

- Scoring language and composition entries

Project Manager, Jan. - July 2008, CPGauger, West Allis, WI

- Managing translation/localization projects
- Preparing documents for translation

- Proofreading, desktop publishing, and bilingual editing
- Communicating with clients and translators

Language Specialist: Russian, Jan.2007 - Jan.2008, Columbia St. Mary's hospitals, Milwaukee, WI

- Interpreting (onsite & phone)
- Translating medical documentation

Project Manager, June - Dec. 2006, ICD, Inc, Milwaukee, WI

- Managing translation/localization projects
- Preparing documents for translation
- Proofreading, desktop publishing, and bilingual editing
- Communicating with clients and translators

LANGUAGES

Fluent in English, Russian, and German; knowledge of French and Spanish.

PROFESSIONAL ASSOCIATIONS & COMMITTEES

Society for Technical Communication (STC) STC, Outstanding Article Judging Team, 2011

STC, Wisconsin Chapter, Program Committee, 2010-2011

Association for Business Communication

American Medical Writers Association

Technical and Business Writing Advisory Committee, University of Wisconsin-Milwaukee

Director of Midwest Association of Translators and Interpreters, 2008-2009

American Translators' Association

Phi Kappa Phi Academic Honor Society (academic record in the top 10% of the graduating class)