PROJECT RISK MANAGEMENT: DEVELOPING A RISK FRAMEWORK FOR TRANSLATION PROJECTS

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To my parents, Sergey and Nadezhda:

Whose unwavering love and support are the islands of certainty in my life

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INTRODUCTION

> It is a world of change in which we live, and a world of uncertainty. We live only by knowing something about the future; while the problems of life, or of conduct at least, arise from the fact that we know so little. (Knight 1921, 199)

While catastrophic events such as the Chernobyl disaster or the Deepwater Horizon blowout that resulted in the worst oil spill in the U.S. history are rare, they are a reminder of the ubiquitous uncertainty in our lives, of the risks that arise from uncertainty, and of the fact that decisions are often made under conditions of uncertainty. As Peter Bernstein observes, "when our world was created, nobody remembered to include certainty. *We are never certain; we are always ignorant to some degree.* Much of the information we have is either incorrect or incomplete" (1998, 206-207; the emphasis is Bernstein's). In his influential work *Risk, Uncertainty and Profits*, Knight (1921) points out that uncertainty about the future and the present is an inherent part of our lives. We simply do not possess the ability to see the future and there is always some knowledge about the present that we lack at any given point in time. Decisions that we make in the face of uncertainty are based on speculation, forecasts, assumptions and guesses, and for this reason present an inherent risk.

Risk taking, gambling and the desire to manage risks (that is, to insure against them, avoid them, or take advantage of them) have existed in human society for millennia. As early as 3000 B.C., interest rates charged in Babylon included a "risk

premium" that reflected the riskiness of the venture for which the loan was made (Bogardus and Moore 2007).Today, management of risks is not just a hot topic. It is an important area of focus for organizations and professionals in many areas, such as construction, healthcare, finance, the military, and project management. The focus on risk management is not surprising considering that the impact of decisions made by businesses, organizations and individuals can be more significant today than even half a century ago due to technological advances, globalization, and the ever-increasing complexity of many professions. Even a seemingly harmless error or a decision to ignore an obvious risk can have far-reaching consequences.

This dissertation is an attempt to explore the management of risks that occur in translation and localization projects which are carried out in what has come to be known as the language industry. This industry is still very new and is in the early stages of its development. It can be characterized as highly projectized, globalized, diverse, and fast-moving; at the same time much of it remains hidden and unknown to outsiders, like the submerged portion of an iceberg. As is the case in other industries, language industry projects are executed under conditions of uncertainty and therefore present risks that must be managed. But unlike in other industries, such as healthcare, manufacturing or finance, little attention is paid to uncertainty, risks, and management of risks. It is my hope that this dissertation will encourage further study of, and discussion about, risk management among language industry and translation scholars and professionals, especially among those engaged in studying and teaching project management.

This dissertation is presented in six chapters. Chapter One discusses the background of the study, the statement of the problem, the significance of the study and key concepts, such as project; project management; risk and uncertainty; risk management; risk management processes and maturity model. Chapter One also provides a brief overview of the language industry, explains the role of risk management in the industry and discusses why it is relevant for both industry professionals and translation studies scholars and students. Although little has been written to date on risk management in translation and in the language industry, an overview of the existing sparse literature is presented. The lack of literature on risk management in translation not only reflects a gap in research, but magnifies the challenge of implementing a generic risk framework, such as that of the Project Management Institute (PMI) in the language industry. Although the generic nature of such frameworks presupposes that they can be applied in any industry and project type, any industry-specific implementation will have unique characteristics.

The goal of this dissertation is to address the practical problems of applying a generic risk management model in translation and localization projects. Using a case study methodology, the dissertation examines how a generic risk management framework can be applied in a translation company in order to increase awareness of risk, develop a consistent and stable culture of risk management, and create a set of specific tools and templates that project managers can use when carrying out risk management activities in translation and localization projects.

Chapter Two of this dissertation provides an overview of existing risk models. Particular attention is paid to the risk model presented in PMI's framework for project management, *A Guide to the Project Management Body of Knowledge* (*PMBOK® Guide*) (PMI 2008) and its *Practice Standard for Project Risk Management* (PMI 2009), which discusses risk management in detail. Other risk models are described in this chapter as well. These standard frameworks are reviewed and discussed in detail in order to show and address the different understandings of key concepts, such as risk, risk management and risk management processes that exist between different industry groups.

Chapter Three presents an approach to developing a risk management model for translation projects. A comprehensive Risk Breakdown Structure (RBS) for translation projects is proposed that classifies sources of risk according to activity, project management, organization, external bodies, events and circumstances, and technical aspects of projects. A detailed breakdown of sources of risks at the level of one activity, specifically translation, is also proposed. Since part of the research question involves the creation and testing of a translation risk breakdown structure, such an RBS is created and tested as part of this case study.

Chapter Four presents the methodology of the dissertation, which consists of a case study carried out in a U.S.-based translation company. This chapter offers a description of the case study setting and the background of the participants; it also discusses the design and the execution of the case study. The chapter starts with a discussion of the objectives and timeline of implementation of risk management in the

company. A description of the materials used in the case study follows. These materials encompass training documents; risk management tools and templates; interview protocols; and pre- and post-implementation procedures and measurements. Chapter Four concludes with observations of how the actual case study was carried out, including modifications made to the original case study design during the project execution phase.

Chapter Five presents the findings of the case study and analyzes these findings. The first part of the chapter offers the qualitative and quantitative findings. The qualitative findings include project reports, risk management training feedback, risk management templates feedback, as well as feedback from participants about the risk management processes. The quantitative findings include pre- and post-implementation profit margins, the number of identified risks and risk events encountered during the projects that comprise the case study (both previously identified and unexpected), and the results of the risk management maturity level assessments.

Chapter Six, the final chapter, offers the analysis of the collected data and presents conclusions drawn from this study. The validity of the risk sources model is analyzed, the impact of the risk management implementation on the project managers is evaluated and the risk management training is discussed. Results of the study are summarized, suggestions for improvements to the risk management training and specific risk management processes, as well as other recommendations are offered. The chapter also discusses the contributions and limitations of the study and proposes future avenues of research.

Ancillary information, including the post-implementation interview protocol, RBS (Risk Breakdown Structure) document, risk management process document, as well as IRB documentation (original approval and a renewal of the approved consent forms), are included in the appendices.

CHAPTER 1. PROJECT BACKGROUND, QUESTIONS AND CONCEPTS

1.1 Project Background

This project grew out of my experience working as a project and account manager in a translation company for about ten years. Or rather, it grew out of the frustration of being engaged in a constant firefighting and reacting to events as they occurred in projects rather than proactively managing them. It became obvious very quickly that building a risk awareness culture, getting stakeholders' buy-in, and developing and implementing a comprehensive risk management program was a must. Doing so is much easier said than done, however.

The risk management principles described by international standards such as the Project Management Institute's (PMI's) *A Guide to the Project Management Body of Knowledge*[1,2] and *The Practice Standard for Project Risk Management* provide generic, high-level information, but not specifics of how exactly those principles can or should be implemented, for example in a translation company: "A practice standard does not prescribe how the process is to be implemented, leaving this subject for other forums such as handbooks, manuals, and courses" (PMI 2009, 1). The near-total absence of literature and training on risk management specific to translation and localization projects

[1] Its abbreviated title – *PMBOK® Guide* – will be used throughout the rest of the dissertation.
[2] Unless otherwise noted, all citations are from the most recent (fourth) edition available at the time of writing, from 2008.

added to the challenge. This dissertation research is an attempt to overcome these challenges and provide specifics of how to develop a risk management program and implement it in a translation/localization company.

1.1.1 Language Industry

1.1.1.1 Industry Size and Services Offered

According to Common Sense Advisory, translation, localization and interpreting services represent a 33.5-billion dollar industry with an average annual growth rate of 12.17 % (Kelly, DePalma, Stewart 2012, 2). This industry sector, often referred to as the language industry, is relatively new. The nature of services performed in the language industry has been expanding drastically. These services include more than just translation, interpreting, or editing. Digitization and computerization brought a wide range of services, such as localization and internationalization, and changed the nature of more traditional services, for example desktop publishing.

Localization, which is "[t]he processes by which digital content and products developed in one locale (defined in terms of geographical areas, language and culture) are adapted for sale and use in another locale" (K. Dunne 2006, 4), started with traditional desktop applications, database content and static web pages. It is now done for web-based/cloud, mobile applications, content management systems, help systems, eLearning and CBT courses, and for any content that is delivered digitally. Localization service can also be referred to as localization engineering and/or integration by language companies.

Internationalization, which is the development or design of digital content to facilitate and make localization possible, is another service, which was brought on by digitization.

Multilingual desktop publishing has been one of the services offered by language companies, but its nature has changed over the past few years. While traditional desktop publishing is not going away any time soon, content authors are increasingly pressured to create, manage and distribute content virtually, adding localization engineering aspects to the job of traditional desktop publishers.

Other services that are offered by language companies include terminology management, language quality assurance, third-party review, cultural assessment, transcription, subtitling, voice over and dubbing, MT (machine translation) post-editing, multilingual brand management, transcreation, multilingual search-engine optimization, language consulting, alignment, internationalization review and engineering.

1.1.1.2 Characteristics

The appearance, rapid growth and expansion of the language industry in recent decades are due to the globalization of markets, the digital revolution, the advent of the information economy, and the globalization of production (K. Dunne 2012, 143). The language industry, as Dunne states, is “primarily digital, outsourced, and project-driven” (K. Dunne 2012, 144). These three characteristics are a key to understanding the nature of the industry. They are also a key to understanding the challenges associated with the implementation of risk management.

Because they are conducted in a highly outsourced industry, language projects often have lengthy subcontracting chains. Thus, the primary buyer of a language service, for example, a medical device manufacture, might outsource translation of a user manual to a large language services provider (LSP). LSPs might support a single language (single-language LSP) or multiple languages (multiple-language LSP). The LSP who was contracted by the primary buyer will likely further outsource parts of the project (certain languages and/or translation, editing, desktop publishing in a specific language) to a smaller LSP, which will send portions of that work further to a freelancer (or even a group of freelancers). This outsourcing chain can be more complicated if several LSPs or groups of freelancers are involved, or less complicated and more direct, should the larger LSP decide to work directly with specific freelance specialists.

1.1.1.3 Composition

A recent market survey by Common Sense Advisory draws parallels between the language service industry and other service industries, such as law and accounting firms, pointing out a high degree fragmentation and a large number of small companies. About 65% of LSPs have between two and five employees and 25.52% have between six and twenty employees (Kelly, DePalma, Stewart 2012, 6). Less than two percent of language companies have fifty-one or more employees (Kelly, DePalma, Stewart 2012, 7). The same survey points out the fact that most of the language companies are privately owned (94.18%) and are primarily located in Europe (49.38%) and North America (34.85%).

In terms of revenue, the top five surveyed are $200+ million companies by revenue[3]. The top six through 100 companies have between $4 million and 150 million in revenue. The rest of the companies have less than $4 million in annual revenue. These revenue numbers confirm, once again, that the language services market is highly fragmented and the majority of the companies are very small.

1.1.2 Risk Management in the Language Industry

Many personal and business decisions we make are made under conditions of uncertainty. We might know what impact (or impacts) our decision will have, but then we might not. Some of the consequences of our decisions might be less desirable than others, but until after the decision is made, we might not know whether the consequences will be in line with our expectations or some other, unforeseen events will occur as a result of the decision made, so we have to take risks.

For example, the decision by a milk powder producer to add melamine to the powder to make it appear to have higher protein content may result in a hundred thousand victims (BBC 2010). A prospective homeowner who buys a house in an overheated real estate market and expects its value to grow indefinitely puts the future and financial stability of his or her family at risk. In finance, construction, healthcare and certain other industries the connection between decision making and people's well-being, financial stability and even lives is obvious. Consequently, the need to manage risk associated with

[3] Total of 26,104 LSPs were surveyed

decision making is also obvious in those industries (although not to everyone in finance, apparently, given the mortgage market meltdown in 2008). In the language industry, however, the existence of risks is not self-evident. Moreover, it is not easy to identify risks or anticipate the impact those risks might have, especially if one has no prior first-hand experience dealing with the consequences of risk events in projects.

The structure of the language industry has shaped the perceptions of and attitudes to risk management within the industry. Despite the language industry's name, language services are still carried out very much as in a cottage industry: the work is done on a small scale by those working from home rather than in a factory setting, and the product/service being offered is typically unique rather than mass-produced. A majority of the companies, as has been discussed earlier, are small companies. In small language service providers (LSPs), translation and localization project managers play multiple roles: a brief survey of job ads for translation or localization project managers shows that desktop publishing, proofreading, editing and other tasks are typically included in project manager job descriptions. By comparison, in other industries project managers focus their attention strictly on management, rather than on performing non-management related tasks. Even in the largest language companies, narrow specialization results in the management function for a specific project being divided between multiple people, so that no one person is in control of all aspects of that project, such as cost, time, risks, or resources. Each of these extremes—the jack-of-all-trades approach vs. the absolute division of labor—limits the professional growth of project managers in its own way, as

the project managers are either performing too many non-project management related tasks, which distracts from project management itself, or their immediate purview does not include all aspects of the full project because they are only managing certain aspects of the project (e.g., finding vendors and outsourcing project tasks, but are having no control over the project budget or timeline). Neither approach to defining the scope of a project manager's responsibilities allows project managers to fully apply their knowledge of project management processes, concepts, best practices or standards, including risk management. Moreover, the relatively flat organizational structure and absence of hierarchy in small companies can limit the potential professional growth and career paths of project managers since there are no middle or upper-level managerial positions to which they can aspire. The flatness of small companies also precludes issue escalation and the implementation of a hierarchical reporting structure that imposes checks and balances on the employees.

The nature, composition and characteristics of the language industry are not the only factors impeding risk management; there are other reasons why risks are not managed in language projects.

First of all, translation, localization and other language services are often perceived as an add-on feature or as a support element to the main product, for example to a piece of software (interface) or a piece of equipment (instructions manual, marketing materials). In other words, language services are not themselves deemed to be a primary product, service or result (for example, the Windows software platform is the product,

while the languages in which it is delivered—original English, or localized German, French, etc.—are just features, a functionality of the product). For this reason, language services are almost always less visible than the main product, service or result. And if something is not visible, it increases the level of uncertainty for the project and escapes the attention of those who manage risk. While language is perceived to be only a "feature" of a product or service, it has a direct impact on how the product or service will be received by its buyers. For example, if a company creates the best piece of software ever developed but the "language features" of the software (user interface, user documentation, support materials and so forth) are poorly localized or not localized at all, the buyers of the localized version will be less satisfied than their counterparts who use the source version of the software. Lower satisfaction level with the product is likely to frustrate customers, push them to use product support more often, and encourage them to look for alternatives. This can result in higher product support costs, lower sales, and loss of customers for the company.

Second, a typical language project involves relatively small amounts of money and is of relatively short duration compared to a construction or product development project, for example. Shorter project duration of projects means that the project manager and the team have less time to focus on risk management. Likewise, if a project is small, it becomes more difficult to justify the cost of risk management to the client or even to upper management within the language services provider organization itself. Shorter duration also means that there is less time to recover should any risks turn into issues

during the project. Finally, a smaller budget and/or a narrower profit margin means that there will be no funds left to recover from risks should they occur.

Third, language companies provide services that support other industries. They provide services that are outsourced and they themselves outsource many services. Research by Common Sense Advisory shows that 87% of companies outsource most or all of their language services (DePalma and Beninnato 2003). Outsourcing is one of the risk response strategies in risk management. In an outsourcing relationship, the outsourcer, or buyer, who does not possess certain capabilities (e.g., translation skills or management of localization projects) outsources the work and, by extension, transfers the risks associated with that work to the seller who offers the needed capabilities. As with any other type of risk transfer (such as insurance or warranty), the risk in outsourcing translation is not decreased or eliminated—it simply becomes the responsibility of the language company. If the language company that becomes responsible for the project does not manage the risks associated with it, it is not providing part of the service it is being contracted to perform.

Fourth, both the "raw material" and the output (product) in the language industry are "language." The fact that language is at the core of the translation services is associated with two perceptions: the social attitude to language professionals in general and the misperception of what it takes to be a translator and to translate. As language is an innate skill, the knowledge of language is often taken for granted. Hence language-related activities and services do not appear to require much effort and seem to have no

risks associated with them. With respect to translation (or interpreting, for that matter), the perception on the part of those not familiar with the activity is that anyone who speaks two languages can translate and that no additional skills are required. For example, a job description from the Cuyahoga County Board of Elections for a bilingual poll worker includes a "translator function:" "A Bilingual Poll Worker is also responsible for translating voting instructions and providing assistance to Spanish speaking voters with limited English proficiency" (Cuyahoga County Board of Elections). However, in the candidate requirements nothing is mentioned about translation, only that the candidate is able "to speak Spanish and English fluently." The posting does mention that the worker is required to attend a bilingual poll worker training session, but it is unknown what that session would include. I can offer many similar anecdotes from my personal experience.

Although outsiders to translation consider that it is only necessary to speak two languages in order to translate, nothing can be further from the truth: the complexity of the cognitive processes involved in the translation (or interpreting) activity is still poorly understood, leaving such fundamental questions of what it means to translate, what it takes to become a translator, or even what translation is, without definitive answers. See, for example, research on cognitive aspects of translation and translation process by Shreve and Diamond (1997), Séguinot (1989), Jääskeläinen (1989), Shreve (2002), Angelone (2011), Jääskeläinen (2011). As the American Translator Association's president Jiri Stejskal mentioned in an interview with Fox News, it takes longer to train a translator than a fighter jet pilot (Fox News 2011). As no one would argue that being a

fighter jet pilot is not a risky activity, it would be quite logical to assume that a profession that requires longer training has its challenges and risks as well, otherwise why would one have to undergo such a lengthy learning and training period?

All the factors discussed here have shaped the language industry and undoubtedly contributed to how project management is practiced today—without much structure or consistency in its processes within organizations. Given the low level of maturity[4] of project management processes in most organizations, risk management is unlikely to be practiced. As Stoeller (2003) observes, "although risk management is one of the most important tools available to Localization Project Managers, it has been ignored due to a lack of awareness and training."

At the same time, while translation and localization professionals are seeking to improve their performance by applying formal methodologies and developing best practices, there is yet another challenge with which they must contend, namely the perception of the language industry and of translation and localization projects by those outside the domain. Risks associated with translation and localization projects are perceived as insignificant or insufficiently "real" to warrant formal risk management. To take but one example of this perception, consider the opinion expressed by a reviewer of the prospectus of the present dissertation during the review of the author's application for approval to conduct human subject research by the Institutional Review Board at Kent State University:

[4] The concept of maturity, including capability maturity, organization maturity and risk management maturity will be discussed later in the chapter.

> While it is gratifying to see disciplines push their boundaries, might I offer a word of caution? In the decision-theoretic sense, risk is associated with the randomness generated by events external to a firm and not under its control. I think the PI [principal investigator] is trying to capture here might be interpreted as "quasi-risks or dangers associated with managing translation projects." In a classic interpretation, the danger of the source material to be translated being in error presumably could be guarded against by insertion of appropriate clauses in the job contract; this would effectively disconnect the translation service from externally generated factual errors. As to the other kind of quasi-risk exemplified by the PI in p. 3, the danger of a slightly inappropriate style or misplaced technical jargon being used is an internal matter falling under the purview of classic quality management through training and control. (KSU IRB 2012)

This comment raises several important issues that must and will be addressed here. First, if risk is associated with the randomness generated by events external to a firm and thus is not under the firm's control, then the potential existence of factual errors in the source, which is generated externally, is also outside of the translation firm's control. Therefore, by decision theory's definition, the event of factual errors made in the source qualifies as a risk. Inserting a clause in a contract specifically addressing this issue is a mitigation of that risk and therefore constitutes risk management.

Second, this risk can only be mitigated and not avoided. Even if responsibility for source errors is contractually assigned to the client, the burden of proving that translation errors were caused by errors in the source falls on the shoulders of the translation team. Proving the cause-effect linkage between flawed source materials and translation errors takes time and therefore has the potential to affect the project schedule and budget. It can also lead to challenging situations if the communications management plan has not made provisions for this risk event. In sum, multiple problems could occur should the risk of source errors materialize in a project.

Third, uncertainty is inherent in language (and therefore in the tasks of writing, speaking and translating). Words do not have a fixed meaning. A perfect example is what is understood by *risk* in different disciplines (e.g., decision theory, project management, finance, etc.). If language were not uncertain, and the meaning of words was fixed, no debates about the meaning of concepts would be necessary. The process of translation is therefore, a process of decision making under uncertainty. Indeed, recent cognitive research in translation studies is being done in this area, for example by Tirkkonen-Condit (2001), Darwish (1999, 2008), Angelone and Shreve (2011), Angelone (2011).

Finally, in project management risk and quality management are not mutually exclusive. These are often different sides of the same coin. On the one hand, quality is an area of risk: many existing taxonomies of risk sources specifically identify quality risks (Heldman (2005), PMI (2008), Wideman (1992), Cooper (2005)). On the other hand, risk management processes themselves are subject to quality management.

1.1.3 Risk Management and Translation Studies

Risk management is an essential part of project management, as evidenced by the fact that most, if not all, comprehensive resources on project management include a section addressing it. Among such are Burke (1999); Cleland and Ireland (2004); Cabanis-Brewin and Dinsmore (2005); Dobie (2007); Wysocki (2009); Richardson (2010); Morris, Pinto and Söderlund (2011). Stand-alone book-length works on risk management in the context of project management are also widely available. For example DeMarco and Lister (2003) write on risk management in software projects; Ayyub (2003) in

engineering and economics; Cooper, Grey, Raymond and Walker (2005) in large projects and complex procurements; DSMC (1989) in defense projects; Niwa (1989) in engineering; Petite and Hobbs (2011) in project portfolios. Many works focus on more generic, high-level risk management processes, using experience and examples from various industries, but often draw heavily from software/IT, defense and manufacturing/engineering. See for example Chapman and Ward (1997, 2002); Edwards and Bowen (2005); Haslett (2010); Hillson (2002, 2004, 2009); Hopkinson (2011); Loch, DeMeyer, Pich (2006); Pritchard (1997); Raftery (1994); Royer (2002), van Well-Stam (2004); Westney (2001); Wideman (1992). Articles on risk management, whether generic or domain-specific, are quite numerous. Indeed, a comprehensive review of the literature on generic risk management is beyond the scope of this dissertation. A search in Kent State University database for journals whose titles contain "risk management" returned 20 titles in such fields as finance, medical/healthcare, engineering and insurance.

Despite the extensive discussion and treatment of risk management in other domains, risk management in translation and localization has mostly escaped the attention not only of practitioners, but also of translation scholars. The literature review reveals that to date only a half-dozen articles have been published on risk management in language projects (Stoeller 2003, Akbari 2009, Lammers 2011, E. Dunne 2011 and Cismas 2010a, 2010b). In the paragraphs that follow, we shall examine each of these articles in turn.

Stoeller is a PMI-certified project management professional (PMP) who has been active in the localization industry for more than 20 years. His article "Risky Business! Risk Management for Localization Project Managers" (2003), underscores the importance of managing risks in localization and translation projects. Using PMI's framework, Stoeller discusses where risk management fits within a project lifecycle, how risk management activities are conducted and what the risk management processes are. For risk prioritization he uses Tussler's categorization of risks into *tigers*, *alligators*, *puppies*, and *kittens*. The discussion is conducted at a generic level and lacks specific examples or detail (likely due to space limitations). His article, however, draws attention to the lack (often, absence) of risk management in translation project managers' practice and underscores its importance: "A systematic process for risk management avoids reinventing the wheel on each project" (Stoeller 2003).

Akbari's article was published in the proceedings of the 12th International Conference on Translation that was held in 2009 in Malaysia. Akbari provides an overview of the risk management approach from the ISO/DIS 31000 (2009) standard and suggests that it be applied to translation projects.

Lammers, who is also a certified PMP and who has been active in the industry for almost two decades, offers a detailed discussion of the practical application of PMI's risk management framework in software localization projects. He offers a risk breakdown structure for software localization projects and proposes responses to common risks. He

also stresses the importance of a formalized risk management, but admits that it is a challenging process:

> "The challenge facing the project manager is striking balance between the investment in time and resources needed to develop and implement a process versus the savings that risk management process will enable. There is no one 'right' way to perform risk management. Each organization and project presents unique problems and roadblocks" (Lammers 2011, 229)

Dunne (E. Dunne 2011) discusses why risk management must be carried out in translation and localization projects. She highlights some of the common risks encountered in language projects and the challenges that project managers face when trying to implement a formal risk management approach within a company.

Cismas (2010a) discusses specific risks that freelance translators working on scientific and technological translation projects may encounter. She reviews the most common pitfalls in translation contracts (for freelance translators, translation firms and interpreters); draws attention to the risks common in scientific and technical translation projects; and proposes some solutions to mitigate or eliminate these risks and avoid the common traps. Cismas (2010b) also provides examples of bad translation practices and high-profile translation errors, examines the consequences of translation errors and discusses specific checks and measures that can be implemented to avoid translation errors and quality problems.

1.2 Statement of the Problem

1.2.1 Implementing Risk Management in the Language Industry

The most widely used standards that discuss risk management in the context of project management are the Project Management Institute's *PMBOK® Guide* and the *Practice Standard for Project Risk Management*, as well as the ISO 31000 family of standards: *Risk Management – Principles and Guidelines* and *Risk Management – Vocabulary*. Although these standards were developed by practitioners from IT, construction, manufacturing and other domains, they are also intended for use by project management professionals in other domains. If a standard is to be applied across industries, it must be generic.

If an organization desires to operationalize any such generic framework, the organization's management must fully commit to the implementation of systematic risk management, develop the necessary organizational policies, and achieve organization-wide consensus about these policies. Once commitment has been secured, consensus achieved, and policies developed, the organization must still address the question of how risk management will be implemented. Implementation must take into account not just the specifics of the industry, but also the specific context of the particular organization, i.e., its business and project management culture, as well as its policies, in order to be successful. As the *Practice Standard for Project Risk Management* emphasizes, "[r]isk management will be more effective if its practice is tailored to the project and congruent with the organizational culture, processes and assets" (PMI 2009, 3).

1.3 Significance of the Study

Creating a risk management framework that is tailored to translation and localization projects can lower barriers to organization-wide implementation of standard risk management and project management processes. Such a framework can also be applied effectively and efficiently even in organizations with low levels of project management maturity.

While generic frameworks for risk management and risk management standards exist (PMI's *Practice Standard for Project Risk Management*, ISO 31000), their abstract nature is a challenge and often an obstacle to their implementation. Indeed, according to the Project Management Institute (PMI), the *PMBOK® Guide* is a framework, a "foundational project management reference" (2008, 4); it does not prescribe how this framework should be implemented in the context of a specific organization or in a specific industry. Similarly, the *Practice Standard for Project Risk Management* "provides information on what the significant process, tool, or technique is, what it does" (PMI 2009, 1), but leaves it up to the particular organization to determine how to move from the described risk management framework to the actual implementation and how to train project managers to use the framework. If the majority of the organizations in an industry, such as translation companies or language departments of a larger organization, are interested in implementing existing project management standards but are not already familiar with the best practices or are new to project management, they will struggle with

the implementation of such generic standards in the context specific to their industry and organization.

This study focuses on developing and testing an approach to risk management that can be successfully applied within the scope of language projects, and takes into consideration the nature and constraints typical of language projects. The development and use of such an approach offers several direct benefits. It can contribute to the development of more mature project management processes in language companies and translation departments of non-language organizations by:

- including risk management processes, tools and techniques within the scope of language project managers' responsibilities; and
- necessitating the re-examination and improvement of related project management processes, such as those in the areas of communication management, scope management, time management, cost management and others.

In addition, information about risks and how they have been managed in the past can be used to facilitate on-the-job training for new project managers and interns in the language industry. Information about risks and how they have been and will be managed can be used as an educational tool and resource for the buyers of language services to raise awareness of the risk issues involved in translation and localization projects as well as to discover areas of improvement of upstream processes, such as authoring for translation and localization. Information about risks can provide support for business decision-making. When risk events occur in a project, their impact is often visible in the

timeline, the project budget (i.e., the company's profit margin) or the quality of the project or service being delivered. Thus, systematic application of risk management in projects should and will likely improve the company's bottom line and schedule performance, and increase the odds of overall project success.

If an acceptable, easy-to-use approach to risk management is developed specifically for translation projects, it is more likely that a language company will carry out systematic application of the risk management process. Well-established and consistently applied risk management processes will contribute to the overall level of an organization's project management maturity. If more language companies advance on the maturity scale, the language industry as a whole will become more mature.

From an academic perspective, a model developed on the basis of the frameworks from other industries underscores and reflects the interdisciplinary nature of translation and the way in which translation studies can benefit from cooperation with scholars in other disciplines and with practitioners. A translation risk model can serve as the foundation for the development of models for other types of language projects, for example voice-over, dubbing, subtitling or interpreting projects.

Finally, if the risk management program is implemented successfully, this study can be used as for guidance by others in the language industry for developing and implementing systematic project risk management that is suitable for their organizations.

1.4 Concepts

1.4.1 Project

This study adopts the Project Management Institute's definition of a project, which is "a temporary endeavor undertaken to create a unique product, service, or result" (2010, 5). PMI's definition has been adopted for the purposes of this dissertation because it has been widely used by project management practitioners and by scholars around the world (see, for example, Wideman 1992, Conrow 2003, Schwalbe 2006, Bender 2010, and Richardson 2010).

There are other definitions, but they are very similar to PMI's. For example, PRINCE2, another project management methodology, defines project as "a temporary organization that is created for the purpose of delivering one or more business products according to an agreed Business Case" (APM Group Limited 2012, 10) Temporary nature and the delivery of a product or service as a result of the project are two characteristics shared by the PMI and PRINCE2 definitions. In the PRINCE2 definition of a project, the organization must deliver a product or service according to an agreed Business Case. While in the PMI's definition of a project a Business Case is not mentioned explicitly, the *PMBOK® Guide* clearly specifies that business case is one of the inputs to developing a *Project Charter*, which is a document that formally authorizes a project. In addition, as stated on the U.S. PRINCE2 site, the two standards are complementary: "The Process clarity and the strengths of PRINCE2 are balanced by the depth of the PMBOK® Guide" (ILX Group 2012).

1.4.2 Project Management

The *PMBOK Guide*, 4th edition defines project management as "The application of knowledge, skills, tools, and techniques to project activities to meet project requirements" (PMI 2008, 443). APM's definition of project management is very similar to the PMI's: "The application of processes, methods, knowledge, skills and experience to achieve the project objectives." (Association for Project Management 2012).

While projects, large and small, simple and complex, have been carried out throughout history, the discipline of project management is relatively new. In the beginning of the twentieth century, Frederick Taylor and Henry Gantt laid the foundation on which the modern project management discipline was built. Taylor is considered the father of scientific management, and his four principles underscore intentionality and importance of formal training and management. Henry Gantt, who was a mechanical engineer, developed what has come to be known as the Gantt Chart (a bar chart used to show a project schedule) in 1917. The Gantt Chart remains an important project management tool to this day. The most important legacy of Taylor and Gantt in project management is their scientific approach to production, and the planning and control techniques that they developed (such as the Gantt Chart).

Large military projects undertaken in the wake of World War II gave rise to the modern discipline of project management as we now know it. Tools like PERT (Program Evaluation Review Technique) and CPM (Critical Path Method) were developed in 1957. The Earned Value Management technique was introduced in 1964. In 1965 IPMA

(International Project Management Association) was founded and in 1969 the Project Management Institute (PMI) was established in recognition of the growing importance of project management and the proliferation of project management-related seminars and conferences.

Between the 70s and late 90s, many large, high-profile projects experienced failures. Among them were:

- Concorde: this British-French project was completed after approximately a seven-year delay and cost seven times more than the original budget estimate (Morris and Hough 1987, 200)
- the Denver Airport Baggage System: a 16-month delay added $560 million to the cost of the construction of the airport, which started in 1989; the system was scrapped because of the $1 million per month it cost to operate the system—manual baggage handling was cheaper (Calleam Consulting Ltd. 2008)
- 1976 Montreal Olympics: it took the city 30 years to pay off the debt of the Olympic complex construction, due in part to a 1250% cost overrun (Jennings 2012, 14)
- Boston's Big Dig: the most expensive highway project in the U.S. history: increase of more than three times over the original estimate and six years delay in the schedule (Committee for Review… 2003, 12)
- Sydney Opera House construction: completed 10 years late and at a cost of $95 million higher than the original $7 million (Wikipedia 2012)

These failures led to case studies of why projects fail such as "The Anatomy of Major Projects," CHAOS Report by Standish and others. As a result, during this time the focus in project management has shifted toward efficiency and defining and following best practices.

Best practices in project management started to be captured in bodies of knowledge, such as the *PMBOK® Guide* by the Project Management Institute in 1996 and the United Kingdom's Association of Project Management (APM) Body of Knowledge in 1991. *PMBOK® Guide*'s fifth version has been released in Q1 of 2013 and the APM's Body of Knowledge is currently in its sixth edition. Various levels of certifications have also been developed. Currently, several project management organizations offer project management certifications, those offered by PMI (Certified Associate in Project Management or CAPM®, Project Management Professional or PMP®, Program Management Professional or PgMP®, PMI Agile Certified Professional or PMI-ACP®, PMI Risk Management Professional or PMI-RMP®, and PMI Scheduling Professional PMI-SP®), APM, and IPMA being the most recognized internationally.

1.4.3 Maturity Model

In 1991 the Software Engineering Institute at Carnegie Melon University published version 1.0 of the Capability Maturity Model (CMM) for Software. The purpose of the model was to determine the level of process maturity in a software development organization. The model grew out of a government-funded study the purpose of which was development of a method to evaluate software subcontractors. The main influences

on the model were the TQM (Total Quality Management) principles and Philip Crosby's quality management grid. In 2000 CMM was superseded by CMMI (Capability Maturity Model Integration)—a process management and improvement approach.

The evolutionary improvement path of the Capability Maturity Model encompasses five maturity levels: (1) *Initial*: processes are usually ad hoc and chaotic; (2) *Managed*: processes are planned and executed according to policy; (3) *Defined*: processes are well characterized and understood, and are described in standards, procedures, tools, and methods; (4) *Quantitatively Managed*: quality and process performance is understood in statistical terms and managed throughout the life of the processes; and (5) *Optimizing*: processes are continually improved based on a quantitative understanding of the common causes of variation inherent in processes (Carnegie Mellon University 2006, 36-38).

The SEI's work on CMM and later on CMMI inspired creation of other maturity models. Thus, PMI created a global standard for Organizational Project Management—*Project Management Maturity Model*, or *OPM3*®. Aligned with the other PMI's standards, OPM3 is "a framework that provides an organization-wide view of portfolio management, program management, and project management to support achieving Best Practices within each of these domains" (PMI 2008, 1). Similarly, the U.K.'s Office for Government Commerce, publisher of the PRINCE2 standard, developed and released a *Portfolio, Programme, and Project Management Model*, or *P3M3*© standard and *PRINCE2 Maturity Model*, or *P2MM*©. These standards focus on assessing an

organization's maturity of project management processes and identifying opportunities for improvement.

In risk management, several maturity models exist and are used in different industries. Among them is the Project Risk Maturity Model (PRMM) developed by Martin Hopkinson at HVR Consulting (HVR Consulting was later bought out by QuinetiQ). This PRMM is based on the work on developing a risk maturity model done by David Hillson (see Hillson 1997). The model has also been influenced by the Turnbull Report, *PRAM Guide* (APM 2004), and other literature on project risk management. [5] The model identifies four levels of organization's maturity in risk management capabilities. They are:

1. Level 1: *Naïve*

"Although a project risk management process may have been initiated, its design or application is fundamentally flawed. At this level, it is likely that the process does not add value." (Hopkinson 2011, 4)

2. Level 2: *Novice*

"The project risk management process influences decisions taken by the project team in a way that is likely to lead to improvements in project performance as measured against its objectives. However, although the process may add value, weaknesses with either the

[5] This document, *Internal Control: Guidance for Directors on the Combined Code* (The Institute of Chartered Accountants in England & Wales 1999) was published by a committee led by Nigel Turnbull. The document was revised in 2005. It was addressed to companies listed on the London Stock Exchange and required that companies maintain and review internal control and risk management systems, as well as recommended that they report on the effectiveness of these systems. Similar developments in emphasizing risk management occurred in the U.S. and Canada at the same time.

process design or its implementation result in significant benefits being unrealized." (Hopkinson 2011, 4-5)

3. Level 3: *Normalized*

"The project risk management process is formalised and implemented systematically. Value is added by implementing effective management responses to significant sources of uncertainty that could affect the achievement of project objectives." (Hopkinson 2011, 5)

4. Level 4: *Natural*

"The risk management process leads to the selection of risk-efficient strategic choices when setting project objectives and choosing between options for project solutions or delivery. Sources of uncertainty that could affect the achievement of project objectives are managed systematically within the context of a team culture conducive to optimizing project outcomes." (Hopkinson 2011, 5)

1.4.4 Risk and Uncertainty

Uncertainty and risk have been and are widely discussed in domains such as insurance, finance and economics, engineering, and decision making. While it seems that such fundamental concepts would be easy to define, or that their definitions would be consistent across disciplines (or at the very least within the same discipline), such is not the case. Definitions of uncertainty and risk, as well as the ways in which the relationship between the two is viewed, vary among scholars and practitioners across different domains, and even within the same domain.

Historically, risk has been understood as something negative, including in common usage. For example, the Webster's dictionary defines risk as: (1) possibility of loss or injury; (2) someone or something that creates or suggests a hazard. The top two meanings of uncertainty, as defined in the Webster's are: (1) the quality or state of being uncertain; (2) something that is uncertain. (Merriam-Webster). OED defines risk as "hazard, danger; exposure to mischance or peril" and uncertainty as "the quality of being uncertain in respect of duration, continuance, occurrence, etc.; liability to chance or accident. Also, the quality of being indeterminate as to magnitude or value; the amount of variation in a numerical result that is consistent with observation (Oxford English Dictionary) Therefore, in common usage the concepts are not the same and not necessarily related. Nevertheless, the risk is generally understood as something negative.

In insurance, risk is viewed as something negative and is defined in terms of uncertainty. For example, the National Association of Insurance Commissioners and the Center for Insurance Policy and Research define risk as "uncertainty of a financial loss; term used to designate an insured or peril insured against" (NAIC 2012). Lloyds defines risk as "(a) the possibility of some event occurring which causes injury or loss; (b) the subject-matter of an insurance or reinsurance contract; or (c) an insured peril" (The Society of Lloyd's 2012). No definition of uncertainty by major insurance associations, such as NAIC (mentioned above), the International Risk Management Institute, the American Insurance Association or Lloyd's, one of the oldest insurance corporate bodies, was found.

In economic theory, risk is understood as measurable uncertainty (see, for example, Knight (1921), Keynes (1921)) and uncertainty is understood as something that cannot be measured. This understanding goes back to Knight's seminal work R*isk, Uncertainty & Profit*: "[i]t will appear that a *measurable* uncertainty or 'risk' proper, as we shall use the term, is so far different from an *unmeasurable* one that it is not in effect an uncertainty at all. We shall accordingly restrict the term 'uncertainty' to cases of the non-quantitative type. It is this 'true' uncertainty, and not risk, as has been argued, which forms the basis of a valid theory of profit and accounts for the divergence between actual and theoretical competition" (119).

The ideas of Knight, Keynes and Shackle are currently undergoing a revival in economic thought. Svetlova and Fiedler (2009) draw attention to the distinctions between uncertainty and risk as understood by Knight, Keynes and Shackle. They argue that the interchangeable use of the terms "uncertainty" and "risk" constitutes one of the causes of the latest financial crisis. Thus they ask rhetorically, "Are the situations faced by markets daily truly "risk"? If these situations are not risk, as Knight and Keynes suggest, then models that are based on numerical probabilities do not make sense" (Svetlova and Fiedler 2009, 27). Specifically, authors refer to the Moody's KMV definition of default risk "Default risk is the uncertainty surrounding a firm's ability to service its debts and obligations. Prior to default, there is no way to discriminate unambiguously between firms that will default and those that won't. At best we can only make probabilistic assessments of the likelihood of default." (Svetlova and Fiedler 2009, 18) In this case, the

credit risk company states that probabilities can be assigned in the situation described, while according to Keynes in a such situation, which is a situation of uncertainty, unlike the situation of risk, probabilities cannot be assigned: “The sense in which I am using the term is that in which the prospect of a European war is uncertain, or the price of copper and the rate of interest twenty years hence, or the obsolescence of a new invention, or the position of private wealth owners in the social system in 1970. About these matters there is no scientific basis on which to form any calculable probability whatever. We simply do not know” (Keynes 1937, 214).

More recently, while the view of the relationship between risk and uncertainty in economic theory has remained, the view of other characteristics of risk has not. For example, Holton defines risk in terms of exposure and uncertainty: “It seems that risk entails two essential components: exposure and uncertainty. Risk, then, is exposure to a proposition of which one is uncertain” (Holton 2010, 119). However, this definition according to Holton is inadequate from an operational point of view, as it depends on the notions of exposure and uncertainty, which cannot be defined operationally. He concludes the discussion stating: “At best we can operationally define our *perception* of risk. There is no true risk.”

The importance of perception of risk and the impossibility of defining risk without consideration of its subjective nature is not uniquely confined to economic theory. In recent work in decision theory and psychology, as well as the new discipline called risk assessment, risk is understood as something subjective, rather than as an

objective reality that exists independent of people: " 'Risk' does not exist 'out there,' independent of our minds and culture, waiting to be measured. Human beings have invented the concept of 'risk' to help them understand and cope with the dangers and uncertainties of life. Although these dangers are real, there is no such thing as 'real risk' or 'objective risk'" (Slovic and Gregory 1999, 356). Similarly, Winch and Maytorena argue that threats and opportunities are "states of mind rather than states of nature" (Winch and Maytorena 2011, 358).

Prospect theory, which was developed by Kahneman and Tversky at the crossroads of economics and psychology, focuses on discussing and explaining behavior and decision making under uncertainty and risk. Their research underscores the challenges of identifying and managing risk events that may or may not occur in the future. Specifically, Kahneman, Slovic, Tversky, when discussing heuristics and biases, focus on situations in which the outcomes of events are known to the experimenters. In such situations researchers identified biases to which the human mind is subject when predicting outcomes: representativeness bias, availability bias, anchoring, and framing effect.

Edwards and Bowen (2005), who study risk in project organizations and approach risk from a communication perspective, view risk as a social construct: "Risks are . . . perceived and experienced by people, whose understanding of them is influenced by the degree to which they accept the values and beliefs of the society in which they live, and by their ability to assess the capacity of those risks to affect their lives" (Edwards and

Bowen 2012, 12). The authors make two critical points about risk being a social construct. First, understanding of risk and attitudes to risk are derived from society. This means that risk and risk attitudes are culturally bound, so those who work in cross-cultural environments, as for example, any project manager in a translation company does, would have to take the culture-bound nature of risk into account. And second, one does not have to experience a risk event in order to understand it. People learn about risks not just from their own experience, but from the experiences of other people. Even those who have already developed certain risk attitudes can change their attitudes when new information becomes available. Moreover, how and how often this information becomes available can affect risk attitudes. Kahneman (2011) discusses how the availability of information about, for example, events or images of a disaster such as a flood or earthquake can impact the public's perception of the risks of such events in the near future. Similarly, the emotional reaction people have toward some risk event will affect their perception of that risk. For example, research on perceived risk carried out by Slovic (1987) found that of 30 risks and technologies provided to the participants, nuclear technology was ranked as the most risky and swimming as the least risky, whereas alcoholic beverages were ranked seventh most risky. In contrast, experts ranked these same items 20th, 10th and 3rd, respectively. The experts rated operating motor vehicles as the riskiest and skiing as the least risky activity. The understanding of risk attitudes, and risk perception that we have developed as a result of the research carried out in cognitive psychology, decision making and communication theory in the past few decades

underscores the importance of effective communication of risk information. The research is directly relevant for project management, and can enhance the effectiveness of project managers. Proper communication, therefore, should not be ignored when managing risk.

In project management, some scholars define risk in terms of its negative impact on project objectives, such as Wideman (1992), Royer (2002), Chapman and Ward (1997), DeMarco and Lister (2003), van Well-Stam (2004). Others view project risk as having the potential to impact project objectives both positively and negatively, such as PMI (2008, 2009), and Hillson (2004, 2009). Hillson divides definitions of risks given in existing project management standards into "negative definitions" (equating risk with threats), "neutral definitions" (which do not mention threats or opportunities) and "broad definitions" (which discuss both threats and opportunities) (Hillson 2009, 28). Thus, according to Hillson's review, standards such as *IEEE 1540:2001*, *IEC 300-3-9:1995US DoD DSMC 2000* and a few others adopt negative definitions of risk. The *PRAM Guide 1997, AS/NZS 4360:1999*, and *BS IEC 62198:2001* contain neutral definitions. The *PMBOK Guide* from 2000, *BS6079-2:2000* and *RAMP Guide* 1997 use broad definitions of risk. (For a detailed comparison of these definitions see Hillson 2009 (26-31).) The trend that Hillson notices in the analysis of the standards' definitions of risk is that from 1997 neutral or broad definitions of risk are used most frequently, whereas negative definitions of risk tended to predominate prior to 1997. As standards are written and reviewed by many experienced practitioners, the recent trend of expanding the concept of

risk to view it as more than just a threat, but also as an opportunity, is a sign that the concept of risk has evolved, at least in the project management field.

Some academics and practitioners, such as Chapman and Ward (2002, 2003), Perminova, Gustafsson & Wikström (2008), Cleden (2009), Petite and Hobbs (2012) advocate for uncertainty management rather than just focusing on risk management. They, however, do not equate risk and uncertainty. Doing so removes the causality in the relationship between the two concepts: "these two phenomena [uncertainty and risk] are not synonymous; they are better described as cause and consequences. Making a distinction between uncertainty and risk is necessary in order to be able to explain the influence of these on project performance" (Perminova et al. 2008, 74).

If uncertainty and risk are equated, it is not just the relationship of causality between the two that is lost. The perception of an event as being a risk to objectives and outcomes in a project is lost too. This important characteristic persists in many definitions of risk: "objectives define what is 'at risk' from the potential effect of uncertainty, and these two factors [uncertainty and objectives] must both be present to give rise to risk" (Hillson 2009, 11). Uncertainty, on the other hand, is present regardless of the existence of objectives.

Another distinction that some make between risk and uncertainty is that of measurability: "situations in which the decision-maker is guided by a knowledge of *a priori* or statistical probabilities fall into the category of risk, whereas situations in which

it is not possible to determine either *a priori* or statistical probabilities fall into the category of uncertainty" (Runde 1998, 543).

Finally, the concept of uncertainty is broader than risk. Uncertainty can be present but not be perceived as something that poses risk to objectives. In other words, not all uncertainty needs to be addressed or managed.

The cognitive approach to risk management in the context of project management proposed by Winch and Maytorena (2011) represents another perspective on risk. The authors define risk as "the condition where inferences from historical data using analytic techniques can provide a sound basis for decision-making because it is believed with confidence that the future will be like the past and the probability of a threat or opportunity event occurring and its associated impact can be calculated from existing data" (Winch and Maytorena 2011, 357). The authors view the availability of information to the decision maker as a spectrum: known knowns (certainty) → known unknowns (identified threats and opportunities) → unknown knowns (identified, but undisclosed threats and opportunities) → unknown unknowns (impossibility or ignorance). The critical points in the authors' approach is that the information space is presented from the point of view of the decision maker (project manager) and that threats and opportunities are states of mind, rather than states of nature (consistent with the communications perspective on risk).

Cleden presents a similar knowledge-centric model of uncertainty ("the four quadrants model") (2009, 13):

- KNOWLEDGE (known knowns):
  - Predictable future states
  - Project data
  - Independently verifiable evidence
- RISKS (known unknowns)
  - Possible states identified
  - Ambiguous outcomes
  - Quantifiable variables
  - Known contingency actions
- UNTAPPED KNOWLEDGE (unknown knowns)
  - Researchable facts
  - Unshared skills and information
  - Untapped resources
- UNCERTAINTY (unknown unknowns)
  - Hidden knowledge
  - Unknown relationships between key variables
  - Unpredictable events
  - ‘bolts from the blue’

As the preceding literature review shows, the predominant view is that risk and uncertainty are not synonymous. Uncertainty is understood as being broader than risk and as the cause of risk. Risk is viewed by the majority of authors as a threat to project

objectives. However recent perspectives also expand the definition of risk to include opportunities (risk as a threat and opportunity). Finally, risk can be measured against the set of expected objectives and outcomes. Thus, for the purpose of this discussion, project risk will be understood as *an uncertain event or condition that, should it occur, can lead to a variation in expected project performance and thereby impact project objectives*. This working definition is preferable to the dichotomy of "threats" and "opportunities" (or negative risk and positive risk) for several reasons. First of all, "threat" and "opportunity" (or dichotomies such as positive vs. negative, upside vs. downside) imply both a judgment and a certain perspective. As Edwards and Bowen point out, because risks are perceived and experienced by people, the concept of risk is "sociologically framed" (11). While the perception of whether a risk is positive or negative may differ between stakeholders, the characteristic of risk as something that introduces a *variation from expected project outcomes* remains stable and therefore is one of the defining characteristics of the concept of risk. Second, while not every threat can be turned into an opportunity, and vice versa, it is quite possible that the same risk may be perceived as a threat by some stakeholders and as an opportunity by others; thus by defining risk as something that can have *either* positive or negative outcomes, we implicitly reject the idea that it can be *both at the same time*, depending on one's perspective. Finally, from a risk management perspective, viewing risk as a threat or an opportunity might be irrelevant when the risk must be accepted because the circumstances or the nature of the enterprise do not allow for any other response.

1.4.5 Risk Management

Risk management is an important area in many domains, such as enterprise risk management, project risk management, IT risk management, financial risk management (including credit, market, operational, liquidity risk), or natural disaster risk management. How risk management is defined varies from one domain to another. The following is an overview of some such definitions.

The *Risk Management Standard* developed conjointly by the Institute of Risk Management (IRM), The Association of Insurance and Risk Managers (AIRMIC) and ALARM (The Public Risk Management Association) defines risk management as "the process whereby organizations methodically address the risks attaching to their activities with the goal of achieving sustained benefit within each activity and across the portfolio of all activities" (IRM 2002, 2). While the standard suggests that it can be used in multiple industries and application areas, its approach seems to be closer to enterprise risk management. *ISO Guide 73: 2009 – Risk Management – Vocabulary* defines risk management also in terms of enterprise or organizational risk management: "coordinated activities to direct and control an organization with regard to risk."

The United States Food and Drug Administration (US FDA) defines risk management as "The systematic application of quality management policies, procedures, and practices to the tasks of assessing, controlling, communicating, and reviewing risk" (US FDA 2006, 10).

The European Network and Information Security Agency (ENISA) defines risk management as "The process, distinct from risk assessment, of weighing policy alternatives in consultation with interested parties, considering risk assessment and other legitimate factors, and selecting appropriate prevention and control options" (ENISA 2012).

In this dissertation, risk management will be discussed specifically in the context of project management. For this reason and because the PMI framework is at the core of the approach adopted in this dissertation, the definition of risk management by the Project Management Institute will be adopted: "Project Risk Management includes the processes concerned with conducting risk management planning, identification, analysis, responses, and monitoring and control on a project" (PMI 2008, 273).

As has been mentioned in the previous section, some project management scholars and practitioners advocate for uncertainty management over risk management. Uncertainty management is understood beyond management of threats/opportunities and even beyond management on the project level. Uncertainty management takes place outside of individual projects' context (Petite 2012, 25).

1.4.6 Risk Management Processes

Many risk management frameworks include and describe similar processes, even if the names of some of these processes differ. The most frequently adopted and referenced framework, based on the analysis of risk management in the project management literature, is the PMI risk management framework described in the *PMBOK® Guide*

(2008) and in *The Practice Standard for Project Risk Management* (2009). *The AMA Handbook of Project Management* (Cabanis-Brewin and Dinsmore 2005), Barkley (2004), Richardson (2010) and a few other practitioners discuss the same set of risk management processes as provided by the *PMBOK® Guide*.

The risk management processes included in the risk management framework in both the *PMBOK® Guide* and *Practice Standard for Project Risk Management* are implemented and followed by many organizations and project management practitioners. The number of the organizations implementing the framework will likely continue to increase considering the active involvement of PMI in the development of ISO standards on project management and risk management. In addition, there is consensus in most of the literature as to the processes that should be performed as part of risk management. For these reasons, PMI's framework will be the starting point and the foundation for this study in developing an approach for managing risks in translation and localization projects.

Cooper et al. (2005) propose a similar set of processes: (a) establish the context; (b) identify the risks; (c) analyze the risks; (d) evaluate the risks; (e) treat the risks; (f) monitor and review; (g) communicate and consult. Hillson (2004, 2009); Edwards and Bowen (2005); and Wideman (1992) discuss the same processes as described in the *PMBOK® Guide*, but use different names for them. Chapman and Ward (2003) propose an approach that is somewhat different from that of PMI. Chapman and Ward's *SHAMPU* risk management framework includes a larger number of processes: (a) define;

(b) focus; (c) identify; (d) structure; (e) clarify ownership; (f) estimate variability; (g) evaluate implications; (h) harness the plans; (i) manage implementation, and some of these processes are defined as being unique to the *SHAMPU* framework.

CHAPTER 2. REVIEW OF EXISTING PROJECT RISK MANAGEMENT MODELS

2.1 Introduction

In the previous chapter, the concepts of uncertainty, risk, risk management and risk management processes were discussed in detail. As there is no one definition of risk, uncertainty, or view of risk management processes, it is not surprising that different models of risk management exist, even within one discipline, such as project management. For this reason, it is important to review the existing project risk management models and identify differences and similarities between them before proceeding to the discussion of the model that will be used in this research.

2.2 The PMI Risk Management Framework

The Project Management Institute is one of the largest professional membership associations, with half a million members and credential holders in over 185 countries (PMI 2012). PMI has developed and continues to update and publish new standards that focus on project management. *The PMBOK® Guide* is the primary foundational standard of PMI's project management framework and describes the processes and knowledge areas involved in project management. The three other foundational standards that complement the *PMBOK® Guide* are: OPM3® (Organizational Project Management Maturity Model), Program Management and Portfolio Management Standards. These

standards are called foundational, because they are the basis on which the extensions and practice standards are built. A detailed list of all PMI's standards is presented in Figure 2.1 below.

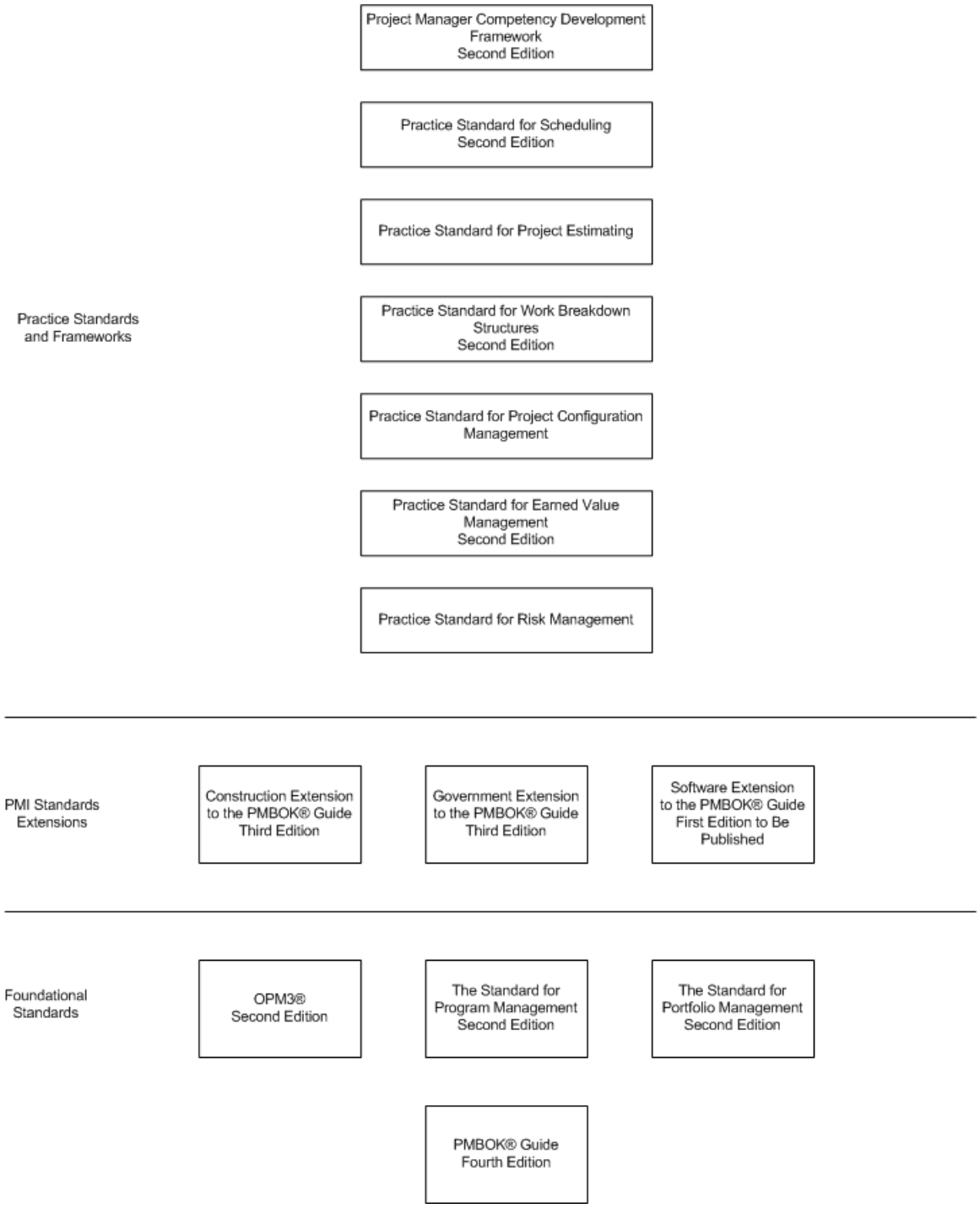

Figure 2.1. List of PMI standards

Practice standards focus on specific tools, techniques or processes described in the *PMBOK® Guide*, expanding upon the principles and concepts presented in the guide and offering specialized tools for project managers. PMI's practice standards are aligned with each other and with the *PMBOK® Guide*.

Finally, PMI also published two standards extensions that focus on specific sectors, namely construction and government and is currently working on a software extension. In 2012, the organization also released the *PMI Lexicon of Project Management Terms*, which offers "a standardized set of frequently used project, program and portfolio management terms with clear and concise definitions" (PMI 2012). The Lexicon currently includes 145 core terms and is in the process of being expanded.

2.2.1 *PMBOK® Guide*

The *PMBOK® Guide* offers a generic framework and a standard for managing projects based on best practices, and is suitable for most types of projects. The first section is the framework and introduces key concepts in project management, such as "project," "project management," "project manager" (the role of), "program management," "portfolio management" and "project management office" (PMO). It also discusses the project life cycle, differences between the project life cycle and the product cycle, differences between projects and operational work, as well as stakeholders and organizational influences on project management.

The Practice Standard for Project Risk Management is a guide "to the use of a tool, technique, or process identified in *A Guide to the Project Management Body of*

Knowledge" (PMI 2009, 1). While it is a stand-alone document, it must still be read, understood and implemented within the context of the *PMBOK® Guide.* For this reason, a brief overview of the process groups (project management standard) and project management areas described in the *PMBOK® Guide* must be presented before the *Practice Standard for Project Risk Management* can be discussed

2.2.1.1 Process Groups

The second section of the *PMBOK® Guide* is the standard for project management, which identifies five process groups:

- Initiating
- Planning
- Executing
- Monitoring and controlling
- Closing

The *PMBOK® Guide* discusses tools, techniques, and outputs with respect to each of these high-level process groups. This section, which is currently an ANSI standard (ANSI/PMI 99-001-2008), is placed in an appendix in the fifth version of the *PMBOK® Guide*, which was released in Q1 of 2013.

The *Initiating Process Group* describes the processes that are performed to define a project or its phase and comprises two main sub-processes: project charter development and stakeholder identification. The project charter documents the results of the initial

scope definition; it serves as the formal authorization of a project or project phase. Stakeholder identification focuses on listing the stakeholders, as well as their interests, involvement and influences on the project.

The *Planning Process Group* describes the processes performed in order to define the overall project scope and objectives and to map out the actions required to attain them. During the planning process, the project manager develops a detailed project management plan and other project documents. Planning processes encompass all areas of a project, including scope, schedule, quality, risk, procurements, and cost.

Project Executing Processes are carried out to ensure that the work is performed in accordance with the project management plan and the project requirements are met. The processes themselves include coordinating, directing and managing various project activities; performing quality assurance steps; acquisition, development and management of the project team; distribution of information; stakeholder expectations management; conducting procurements.

The focus of the *Monitoring and Controlling Process Group* is on measuring project performance and comparing it to baselines. Monitoring and controlling processes include progress measurement; status reporting; forecasting; processing and managing change requests (and controlling changes); and verifying and controlling all aspects of the project, such as schedule, scope, costs, quality, and risks.

Finally, the processes in the *Closing Process Group* are performed to formally complete the project or project phase. Closing processes include obtaining formal

acceptance of the results, products or outputs of the project or project phase; documenting lessons learned; performing post-project or post-phase review(s); updating and archiving any relevant project documents and organizational process assets; and closing out procurements. A summary of the process groups with inputs and outputs is presented in Figure 2.2 below.

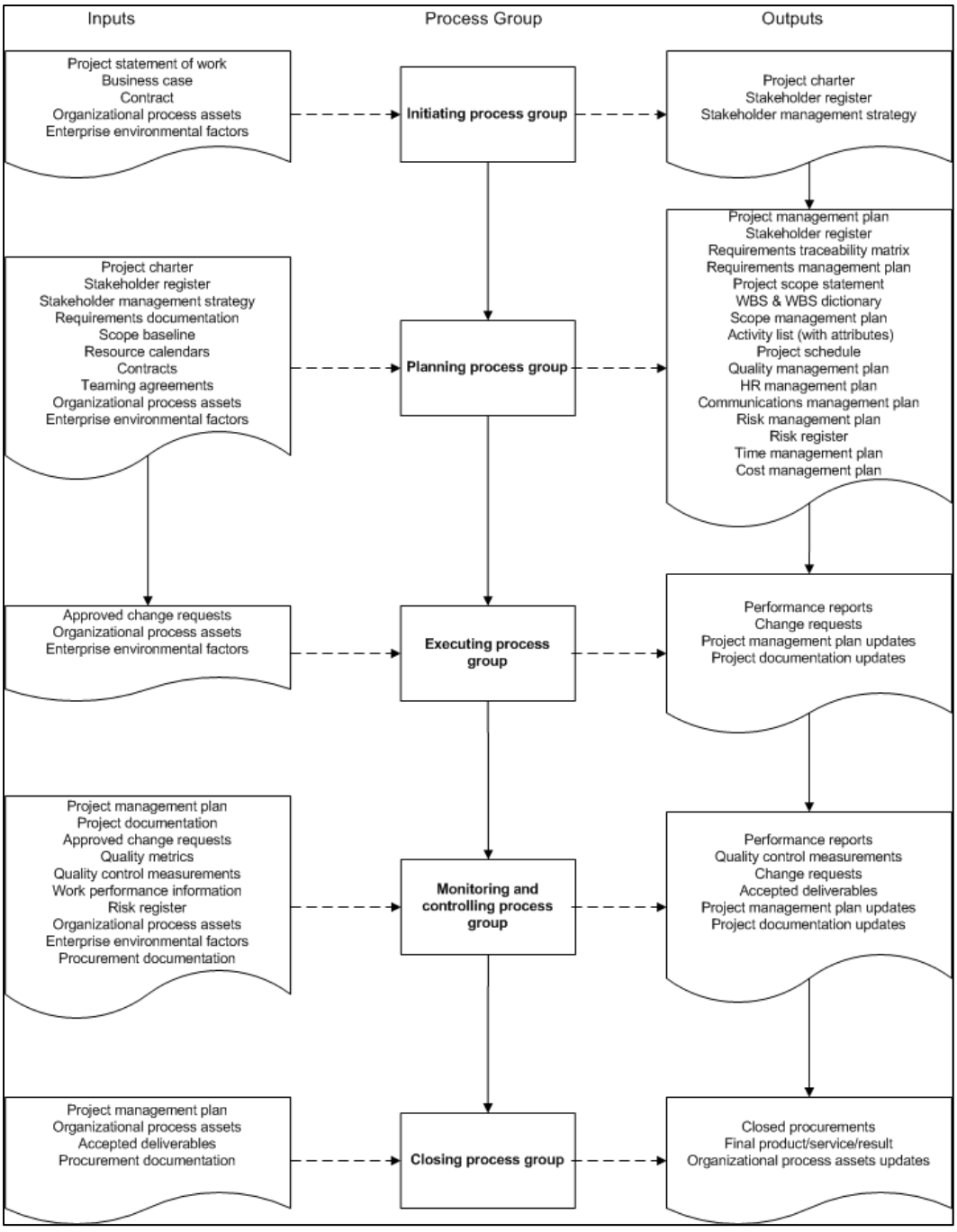

Figure 2.2. Process groups with inputs and outputs

2.2.1.2 Knowledge Areas

The third and final section of the *PMBOK® Guide* discusses the nine project management knowledge areas:

- Project Integration Management
- Project Scope Management
- Project Time Management
- Project Cost Management
- Project Quality Management
- Project Human Resource Management
- Project Communications Management
- Project Risk Management
- Project Procurement Management.

The division of the *PMBOK® Guide* into process groups and knowledge areas is an organizational and rhetorical device adopted by the authors of the Guide to enable the presentation and discussion of the multifaceted domain and practice of project management in a linear narrative and book format. In reality, the processes and the knowledge areas intersect, interact and overlap. Furthermore, the processes are often performed iteratively at different stages of the project, a phenomenon that PMI characterizes as "progressive elaboration" (2008, 17).

The overlap between process and knowledge areas is perhaps most apparent in the discussion of the first knowledge area, project integration management, which includes

"the processes and activities needed to identify, define, combine, unify, and coordinate the various processes and project management activities within the Project Management Process Groups" (PMI 2008, 71). The processes that comprise the project integration management knowledge area include developing the project charter, developing the project management plan, directing and managing project execution, monitoring and controlling project work, performing integrated change control, and closing the project or phase.

The goal of project scope management is to define what is and what is not included in the project. The project scope management plan, and the project scope information that is generated by the processes in this knowledge area are the foundation on which other knowledge areas such as project time, cost, quality, and risk management are established. Without a clear, comprehensive understanding of the project and product scope, a project schedule cannot be created, nor can a budget be prepared, nor can risks be identified accurately.

The goals of project time management are to create a schedule baseline and to ensure that the project remains as close to that baseline as possible and is completed in a timely manner. As mentioned above, project time management processes build on the scope baseline, which may include scope statement, requirements matrix and other scope documentation.

Project cost management focuses on defining project budget and, once the budget has been defined, controlling it. As is the case with many other project management

processes, cost estimating and budgeting are iterative: as more information becomes available, estimates become more precise, but even the final budget approved by stakeholders remains an estimate by definition as the true cost of the project cannot be known until the project has been completed, making cost estimating, budgeting and control open to risks. Cost control requires tracking expenditures, comparing them to the baseline, controlling changes, and taking action to bring the costs within the established limits.

The purpose of project quality management is to define and control quality goals, policies and responsibilities for the project, as well as to ensure that the quality needs and requirements of the project are met. The approach to quality management described in *PMBOK® Guide* is intended to be compatible with that of the ISO 9001 family of quality management standards in its emphasis on customer service, prevention over inspection, detection and correction of errors, continuous improvement and management responsibility.

The project human resource management knowledge area encompasses those processes that enable the project manager to organize and manage the project team. The project human resource management knowledge area also covers the development of a human resource plan and offers tools and techniques for project team development and management, including team building, conflict management and negotiation. In particular, the discussion of this knowledge area emphasizes the importance of motivational, leadership and interpersonal skills for the project manager.

Much of a project manager's work involves providing the right information to the right people at the right time. Effective communication internally with the project team, and externally with stakeholders outside the project team, is key to the project manager's success and key to successful risk management. Stakeholder identification and communications planning processes, which are an important part of project communications management, are more linear and typically occur during the planning stages of the project or project phase, whereas the other processes are routinely carried out throughout the different stages of the project.

During a project the project manager will typically need to purchase products or services from one or more partners external to the project manager's organization. The project procurement management knowledge area addresses the processes that support this need. Depending on the organization's policies, the project manager may or may not issue or oversee the actual contracts, so the organization's legal department or other parties may also be involved in these processes.

Last, but not the least knowledge area is risk management. As noted earlier, the *PMBOK® Guide* distinguishes between two types of project risks: threats and opportunities. The objectives of project risk management are therefore to "increase the probability and impact of positive events, and decrease the probability and impact of negative events in the project." The processes, inputs and outputs included in this knowledge area will be discussed in detail below.

2.2.2 Practice Standard for Project Risk Management

The *Practice Standard for Project Risk Management* is based on the *PMBOK® Guide* and describes the processes, activities, inputs and outputs of the risk management knowledge area in greater detail (PMI 2009, 1).This practice standard explains the framework and purpose of risk management, lists critical success factors for implementing risk management, discusses in detail the six risk management processes, lists tools and techniques available for risk management, and includes a glossary of the key terms used in the practice standard. The practice standard also provides general principles for successful project risk management. They are applicable to most organizations and projects, regardless of size, and can be implemented in international projects. Nevertheless, the authors of this practice standard emphasize that risk management "will be more effective if its practice is tailored to the project and congruent with the organizational culture, processes and assets" (PMI 2009, 3).

The standard draws a distinction between individual project risks and overall project risk. The latter is more than the sum of all individual risks and is addressed on the whole project level, often as part of strategic decision-making, program and portfolio management. The standard also discusses in detail the role of the project manager in risk management. Thus, risk management-related duties might include seeking support for risk management activities, determining risk levels for a specific project, developing a risk management plan, creating open communication about risk management within the project team and among the project stakeholders, approving risk responses before their

implementation, managing contingency funds, overseeing risk management by subcontractors and suppliers, reporting risk management status, escalating risks, monitoring efficiency and effectiveness of risk management processes, auditing risk responses, and documenting lessons learned (PMI 2009, 12).

Appendix D of the practice standard contains an extensive list of tools, techniques and templates for risk management, along with a discussion of their strengths, weaknesses and critical success factors. While detailed explanations or descriptions are not included, this listing is a useful starting point in developing a risk management program since it provides a comprehensive overview of existing tools and techniques that can be used by project managers working in any industry.

2.2.3 Risk Management Processes

Both the *PMBOK® Guide* and the *Practice Standard for Project Risk Management* identify the following high-level risk management processes:

1. Plan Risk Management
2. Identify Risks
3. Perform Qualitative Risk Analysis
4. Perform Quantitative Risk Analysis
5. Plan Risk Responses
6. Monitor and Control Risks

The *Plan Risk Management* process defines how risk management will be conducted in a specific project, i.e., what methodology will be used, what roles and responsibility will be assigned, when and how often risk management activities will be performed, how the criteria for prioritizing risks will be defined, and how the processes will be documented, analyzed and communicated. The output from this process is the project risk management plan.

The purpose of the *Identify Risks* process is "determining which risks may affect the project and documenting their characteristics" (PMI 2008, 282). During this process, project risks are identified by reviewing existing documentation, brainstorming, conducting interviews, performing various analyses (root cause, checklists, assumptions, SWOT) and by using other methods, such as Delphi or diagramming techniques. The results of the *Identify Risks* process are documented in a risk register, which typically includes a list of risks, their characteristics and potential responses, as well as some additional information. Risk identification does not simply occur once, at the beginning of a project, but is iterative and is repeated at certain points of the project, for example at major milestones, when changes are introduced to some aspect of a project or if new information becomes available.

Qualitative Risk Analysis is performed to assess the priority of the risks that have been identified by assessing the probability of occurrence of the risks in conjunction with the impact in the event that they do occur. Much like the *Identify Risks* process, qualitative risk analysis is performed iteratively, as the new, secondary or residual risks

appear and/or as previously identified risks manifest themselves and risk responses are implemented. The output from this process includes the following updates to the risk register: a risk ranking that prioritizes some risks over others; a risk categorization that allows for more effective risk responses since some risks may share common causes; and a list of risks that may require additional or analysis or immediate responses.

The purpose of *Quantitative Risk Analysis* is to provide "a numerical estimate of the overall effect of risk on the objectives of the project" (PMI 2008, 37). This analysis provides information that can be used to estimate contingency reserves (time and cost) and evaluate the likelihood of the project's success. However, this analysis requires significant effort and knowledge of quantitative analysis methods and tools on the part of the project and/or risk manager. During small projects, it may not be cost- or time-effective to perform quantitative analysis if risk responses can be developed and risks can be managed based solely on the information from the qualitative analysis.

During the *Plan Risk Responses* process, the team formulates responses to the risks with the goal of enhancing opportunities and reducing threats to the project objectives. This process begins with risk identification and continues through risk analysis, management and control. The *PMBOK® Guide* identifies four strategies for responding to threats (avoid, transfer, mitigate, accept) and four strategies to address opportunities (exploit, share, enhance, accept).

The *Monitor and Control Risks* process ensures that the identified risks are tracked; responses to risks that arise are implemented; new, residual and secondary risks

are identified and analyzed; and the effectiveness of all the other risk management processes is evaluated. As part of the *Monitor and Control Risks* process, all relevant risk management information is recorded: which risks occurred and when; how effective were the risk responses; which new, residual or secondary risks arose, if any, and when they occurred. This information can be used at the project review or post mortem stage and as lessons learned to facilitate risk management in future projects. The *Monitor and Control Risks* process integrates within the larger framework of the project monitoring and controlling processes.

2.2.4 Risk Breakdown Structure (RBS)

PMBOK® Guide defines a Risk Breakdown Structure (or RBS) as "a hierarchically organized depiction of the identified project risks arranged by risk category and subcategory that identifies the various areas and causes of potential risks" (PMI 2008, 280). Having an RBS can and will make the process of risk identification more efficient, consistent and effective, as it allows the project manager to ensure that the process is comprehensive and detailed. An RBS is typically developed by a specific organization to reflect its needs and more common areas of risk. However, some generic categories are common for companies in the same industry and even across industries, and thus would be relevant for most, if not all projects: for example, counterparty risks such as client or sponsor inability to take delivery of project or inability to pay; natural events such as fire, storms; and technology risks such as lack of technical knowledge, failure rates, reliability and availability. Many works on risk management by high-profile practitioners include a

high-level RBS. For instance, the RBS presented by Cooper et al. (2005, 358-367) includes the following top-level categories: commercial; general contract conditions; counterparty; economic, environment; financial; industrial relations; interpretation of the brief; understanding the requirements; joint venture and partnership; legal and regulatory; natural events; political and social; product life cycle stage; resources; safety; security; skills; software; suppliers and sub-contractors; technology; and transport. Cooper et al. also include the following categories for projects carried out outside of the organization's region or country: communications; culture and customs; health; language; legal/regulatory; offshore location; offshore skills; political; religion; security; staffing. The authors further subdivide these categories into a more detailed RBS (not described here).

The Defense Systems Management College (1989, 3-4) offers a slightly different typology: technical (physical properties, material properties, radiation properties, testing/modeling, software design, etc.); programmatic (material availability labor strikes, requirements changes, political advocacy, etc.); supportability (training, O & S equipment, manpower considerations, system safety, etc.); cost (overhead/G & A rates estimating error, etc.); schedule (degree of concurrency, number of critical path items, etc.)

Edwards and Bowen (2005, 27) distinguish between risks associated with natural systems (climate/weather, geological, biological, extra-terrestrial) and human systems (social, economical, political, financial, cultural, technical, health, managerial, legal).

Finally, Wideman (1992, A-2 – A-4) divides risks into external unpredictable and uncontrollable (regulatory, natural hazards, postulated events, indirect effects, completion); external predictable but uncontrollable (market, operational, environmental impacts, social impacts, currency changes, inflation, taxation); internal, non-technical but generally controllable (management, schedule, cost, cash flow, loss of potential); technical and generally controllable (changes in technology, performance, risk specific to project's technology, design, sheer size or complexity of the project); legal, generally controllable (licenses, patent rights, contractual, outsider suit, insider suit, force majeure). Other practitioners have created risk breakdown structures that include similar categories.

2.3 ISO Standards

2.3.1 Overview

The International Organization for Standardization (ISO) has published three standards that focus on risk management. The *ISO 31000:2009(E) Risk Management – Principles and Guidelines,* is an international standard developed by the ISO Technical Management Board Working Group on risk management. This standard defines risk and risk management; provides guidelines for creating and implementing a framework for managing risk; and contains a detailed discussion of the risk management process. The second, *ISO Guide 73: Risk Management – Vocabulary*, defines core terms such as risk, risk management, risk management process, risk assessment, risk identification, risk analysis, risk evaluation, risk treatment, as well as monitoring and measurement of risk.

This standard references *ISO 31000:2009(E)*; conversely, *ISO 31000:2009(E)* is consistent with definitions provided in *ISO Guide 73*.

Finally, as its name suggests, *ISO/IEC 31010:2009. Risk Management – Risk Assessment Techniques*, focuses on risk assessment techniques in risk management. This standard offers guidance for selecting risk assessment techniques. It uses terminology from *ISO/IEC Guide 73* and presupposes the application of the risk management framework described in *ISO 31000:2009(E)*.

Risk assessment incorporates processes of risk identification, risk analysis and risk evaluation. The *ISO/IEC 31010:2009* standard offers different tools and techniques for use in different project contexts. The appendix of the standard provides a list of tools and techniques mapped to each process of risk assessment process. The appendix also describes each tool or process, and discusses how to select a tool that is suitable for the organization and the particular risk management strategy depending on a range of factors. Among such factors are the team's experience and risk management skills, availability of resources (financial and human), nature and degree of uncertainty, and complexity of the situation. The map also specifies whether the tool/technique provides a quantitative output. Finally, the standard provides a detailed description of each risk assessment technique, and the inputs that are required for use.

2.3.2 ISO 31000

The standard offers guidelines for developing a risk management framework. The suggested components are the mandate and commitment to introducing and supporting a

risk management program; the design of the risk management framework; the implementation of the framework; monitoring and review of the framework; and continual improvement of the framework. Particular emphasis is placed on the establishment of effective risk communication and continual improvement. This standard defines risk as the "effect of uncertainty on objectives" (2009, 1) and risk management as "coordinated activities to direct and control an organization with regard to risk" (2009, 2). Much like PMI's standards, *ISO 31000:2009(E)* underscores the importance of accounting for the specific organization and context in which risk management is implemented: "The design and implementation of risk management plans and frameworks will need to take into account the varying needs of a specific organization, its particular objectives, context, structure, operations, processes, functions, projects, products, services, or assets and specific practices employed" (2009, 1).

At the core of *ISO 31000:2009(E)* are eleven principles (ISO 2009a, 7-8):

- Risk management creates and protects value
- Risk management is an integral part of all organizational processes
- Risk management is part of decision making
- Risk management explicitly addresses uncertainty
- Risk management is systematic, structured and timely
- Risk management is based on the best available information
- Risk management is tailored
- Risk management takes human and cultural factors into account

- Risk management is transparent and inclusive
- Risk management is dynamic, iterative and responsive to change
- Risk management facilitates continual improvement of the organization

If an organization wants the risk management to succeed, these principles must be followed.

The risk management processes discussed in this standard are similar to those proposed in PMI's risk management framework. The ISO processes are: communication and consultation; establishing the context; risk assessment: risk identification, risk analysis, risk evaluation, risk treatment; and monitoring and review. In sum, the risk management frameworks described in PMI's *PMBOK® Guide*'s and in *ISO 31000:2009(E)* do not contradict each other and the risk management processes can be mapped between the two. The following section will examine this mapping.

2.3.3 Comparison of ISO 31000 Processes with the PMI Risk Management Processes

The main conceptual difference between ISO 31000 and PMI's Risk Management framework is that the ISO standard addresses risk in general, while PMI does that specifically in the context of project management. Nevertheless, the risk management processes in the ISO 31000 in the PMI's standards have many areas of convergence. Table 2.1 below presents a comparative summary of the processes. Each of the ISO 31000 risk management processes will be compared to the PMI's risk management processes and the differences will be detailed in the sections that follow.

Table 2.1. Comparison of ISO 31000 risk management and PMI project risk management frameworks

ISO 31000 Risk Management Standard		Practice Standard for Project Risk Management (PMI)
Communication and consultation	≠	*None* as part of project risk management processes; however, communication management is part of the larger, project management framework, rather than limited to the project risk management standard
Establishing context	≈	*Plan risk management*
Risk identification	=	*Identify risks*
Risk analysis *Risk evaluation*	≈	*Perform qualitative analysis* *Perform quantitative analysis*
Risk treatment	=	*Plan risk responses*
Monitoring and review	=	*Monitor and control risks*

2.3.3.1 Communication and Consultation

The communication and consultation process identified in *ISO 31000* does not have a direct equivalent in PMI's risk management framework. However, project communications management is addressed as a knowledge area in the *PMBOK® Guide*. In fact, communications management is addressed on two levels in the *PMBOK® Guide*, namely communications as a source of risk (the communications management plan is one of the inputs to the risk management planning process), and communications of risk- and risk-management related information as an important part of risk management.

ISO 31000 advocates communication and consultation with external and internal stakeholders throughout the project as a necessary part of the risk management process and suggests developing a communication and consultation plan, which is not

inconsistent with the *PMBOK® Guide*, where the communications plan is one of the core project documents created by a project manager.

2.3.3.2 Establishing the Context

This process, according to *ISO 31000*, includes the articulation of organizational objectives, the definition of external and internal parameters, and the setting of the scope and risk criteria for the risk management process (ISO 2009, 15). The goals of this processes are: ensuring that risk management is aligned with the organization's structure, culture, processes and strategy, as well as external stakeholders' objectives and concerns; defining goals, objectives, responsibilities related to risk management processes.

While the *PMBOK® Guide* does not describe a process named "establishing the context," much of what is included in the *ISO 31000* in this process corresponds to the planning of the risk management process (defining the risk management process goals, objectives and the like). Along similar lines, alignment with the organization's strategic objectives and taking into account external stakeholders' interests is part of project integration in the *PMBOK® Guide*. This information is what creates the context for the project and by extension for risk management.

2.3.3.3 Risk Identification

Risk identification is one part of the risk assessment process group (along with risk analysis and risk evaluation). Risk identification is discussed in both the ISO and PMI standards and includes the identification of sources of risks and project areas that might

be impacted by these risks, should these risks occur. ISO 31000 only specifies that "the organization should apply risk identification tools and techniques that are suited to its objectives, and capabilities, and to the risks faced" (ISO 2009, 17). In contrast, the *PMBOK® Guide* specifies in detail the inputs to this process, the existing tools and techniques and what the output of this process should look like. So, while there is no contradiction between the processes in both standards, the *PMBOK® Guide* provides much more specific information on how the process can be implemented.

2.3.3.4 Risk Analysis

The PMI and ISO standards both identify "risk analysis" as a constituent process of risk management. Nevertheless, essential differences exist in how this process is described by the two bodies' standards. PMI differentiates in the *PMBOK® Guide* and *Practice Standard for Project Risk Management* between qualitative and quantitative risk analyses (output from the former being input to the latter). In addition, PMI deems that risk analysis (qualitative and quantitative) includes prioritization of risks for subsequent development of risk responses.

In contrast, *ISO 31000* lists various types of risk analysis, such as qualitative, semi-quantitative, quantitative, or a combination thereof, depending on the project specifics. However, in the view of ISO, the decision about which risks needs treatment and prioritization are part of the subsequent process—risk evaluation—rather than part of risk analysis.

In PMI's and ISO's standards the goals of this process are similar, namely to increase understanding of risk and provide inputs to the next step—risk evaluation and treatment (ISO) or risk response planning (PMI).

2.3.3.5 Risk Evaluation

According to ISO, risk evaluation is the process of "comparing the level of risk found during the analysis process with risk criteria established when the context was considered" (2009a, 18). As noted above, this process has no equivalent in PMI's standards. However the actual process of evaluating which risks need treatment, whether certain risks might need further analysis, and taking into account risk tolerances, is carried out during qualitative and quantitative risk analyses, as well as during the development of risk responses.

2.3.3.6 Risk Treatment

The risk treatment process is the process whereby options are selected to address identified risks according to the defined ranking of risk priorities. During this process, risk treatment plans are developed. These plans should include the rationale for selecting certain treatment options; identifying those responsible for implementing the treatment; listing the proposed actions , as well as required resources and contingencies. These plans should also specify when the defined treatments should be implemented. Risk treatment plans should also include information on the nature and extent of the residual risks that might occur after the implementation of a treatment option.

The nature of this process is very similar to that of PMI's risk response planning. PMI's standards also include a discussion of risk response strategy types (accept, avoid, enhance, mitigate, share, transfer) for both threats and opportunities.

2.3.3.7 Monitoring and Review

The monitoring and review process (the "monitoring and controlling process" in PMI parlance) is a necessary part of risk management. This process requires that the organization ensure that controls are effective; that further information is gathered to improvement risk assessment; that lessons learned, changes and trends are analyzed; and that new risks are identified and analyzed. This process is the same in both ISO and PMI's standards.

2.3.3.8 Summary

In conclusion, there are some differences between the risk frameworks proposed in ISO 31000 standard and *PMBOK® Guide* and *Practice Standard for Project Risk Management*. These differences are:

- In the level of detail: ISO is a high-level generic framework that does not offer specific tools or describe integration with other risk management processes. PMI's standard is also a high-level risk management framework, but it offers much more granular level of detail in describing the constituent processes and in its discussion of the tools, techniques, inputs and outputs associated with each. However, ISO does devote a separate standard, ISO 31010 solely to discussion of risk assessment

techniques. Similar discussion is incorporated directly in the *Practice Standard for Project Risk Management*.

- PMI's *Practice Standard for Project Risk Management* is highly integrated within the larger project management framework offered in the *PMBOK® Guide*; this integration must be considered when evaluating the practice standard.
- The most significant divergence in content between the standards can primarily be explained by the fact that ISO is a stand-alone risk management standard, while PMI's *Practice Standard for Project Risk Management* is part of larger project management framework. So, identifying communications as a sub-process within risk management becomes unnecessary in the PMI's risk standard, because communications management is part of project management; while it must be done in the ISO standard, as it is a stand-alone standard not coupled with a larger project management framework or standard.

2.4 PRINCE2 and M_o_R

PRINCE2 stands for PRojects IN Controlled Environments. This project management method and standard was developed by the Office of Government Commerce of the United Kingdom. The standard is used in the private sector both inside and outside the U.K. This standard does not contradict or replace the *PMBOK® Guide*, but can be used in conjunction with the PMI approach.

PRINCE2 is a process-based method that identifies seven key principles, seven themes and seven processes. The principles are as follows:

- Continued Business Justification
- Learn from Experience
- Defined Roles and Responsibilities
- Manage by Stages
- Manage by Exception
- Focus on Products
- Tailor to Suit the Project Environment

PRINCE2 projects are typically broken down into stages (similar to the PMBOK's phases), defined as: pre-project, initiation, subsequent delivery stage(s), and final delivery stage. PRINCE2 identifies several project management processes that are similar to those identified in the *PMBOK® Guide*. These processes are starting up a project, initiating a project, directing a project, controlling a stage, managing a stage boundary, managing project delivery and closing a project. Another similarity between the *PMBOK® Guide* and PRINCE2 are the PRINCE2 seven themes that closely correspond to the knowledge areas of the *PMBOK® Guide*:

- Business Case
- Organization
- Plans
- Progress
- Risk
- Quality

- Change

Risk is one of the themes. The Office of Government Commerce of the U.K. not only discusses risk in the PRINCE2 standard, but also publishes a stand-alone risk management guide called *M_o_R: Management of Risk – Guidance for Practitioners*.

The *M_o_R* is closely aligned with the 2009 version of the *ISO 31000* risk management standard. The *M_o_R* provides guidelines for risk management, discusses techniques for risk analysis and management; and lists documents necessary for performing risk management. The appendix of the *M_o_R* contains a maturity model for risk management and a so-called risk "health check." Not unlike the *ISO 31000* standard, this guide is not specifically designed for managing risk in projects, but covers management of organization-wide risks. It does, however, describe processes that are very similar to those of the PMI's project risk management framework.

The core of the approach described in the *M_o_R* is documentation of the risk management process. Thus, the guide calls for the use of several specific documents including a risk management policy, a risk management process guide, as well as risk management strategy documents for each organizational activity. The risk management policy supports communication about risk throughout the organization. Depending on the size and complexity of the organization, it may opt to formulate one risk management policy or several levels of policies. The risk management process guide details the specific steps of the risk management process. This guide should be reviewed and updated regularly to ensure that it is aligned with all other policies and guidelines used by

the organization. The risk management strategy describes which specific risk management activities will be carried out during the undertaking in question.

In addition to the three core documents that lay the foundations of risk management in an organization, the guide recommends that other documents also be used, such as risk and issue registers; risk improvement, risk communications and risk response plans; as well as risk progress reports. Creating and maintaining these documents at appropriate stages of projects allows the organization to formalize and document risk management-related activities and processes, and to track and document the results of those activities and processes.

The *M_o_R* guide offers a risk management framework that consists of four main steps or processes:

- Identify
- Assess
- Plan
- Implement

As its name suggests, the first process, *Identify*, includes identification of context and of risks. The goals of first part of this process, identification of the context, are (a) to establish the organization's understanding of the project objectives, scope, assumptions, and constraints; project stakeholders and their objectives; the organization's environment and risk management approach; and (b) to determine completeness of information. This part of the identify process is similar to the planning of risk management in PMI's risk

management framework. Among the techniques suggested by the *M_o_R* for the identification of context are SWOT analysis, horizon scanning, stakeholder analysis, and PESTLE analysis.

The goals of the second part of the *Identify* process are to identify the risks; create a risk register in which the risks and relevant information are documented; and prepare KPIs (key performance indicators) and EWIs (early warning indicators). Techniques recommended for the identification of risks include the use of checklists or prompt lists, cause and effect diagrams, group techniques (brainstorming, nominal group technique, Delphi technique), questionnaires, individual interviews, assumptions analysis, and constraints analysis. The results are documented in the risk register. This step is the equivalent of the risk identification step in the PMI's risk management framework.

The second process, *Assess*, involves the assessment of the identified risks. Assessment entails both estimation and evaluation of the risks. The goal of estimation is to prioritize risks. Prioritization can be performed using probability assessment, impact assessment, proximity assessment or expected value assessment. This component of the assessment process is similar to the qualitative analysis of risks in PMI's approach, while evaluation is very similar to the quantitative analysis of risks.

The purpose of the second facet of the assessment process, evaluation, is "to understand the risk exposure faced by the activity by looking at the net effect of the identified threats and opportunities on an activity when aggregated together" (OGC 2010, 41). Evaluation can be carried out by looking at summary risk profiles and/or expected

value assessments or by using probability risk models, probabilities trees and sensitivity analysis.

The third process, *Planning*, involves preparation of responses to the risk events (i.e., threats or opportunities) to be implemented if and when the risks arise during the project. Cost-benefit analysis and decision trees can be useful techniques for developing risk responses. An equivalent planning process exists in the PMI risk management framework, but PMI's standards contain greater detail and identify categories of risk responses (or strategies), such as avoid, mitigate/enhance, share, transfer, accept.

The fourth process, *Implement*, involves the implementation of risk management responses. This process is akin to the monitoring and control process in the PMI framework, and includes monitoring responses for their effectiveness and issuing corrective actions when responses are ineffective. Implementation techniques offered by the *M_o_R* include updating summary risk profiles, tracking risk exposure trends, and updating probabilistic risk models.

While not specifically mentioned in the *M_o_R*, communication about risk is an important process that occurs during all risk management processes, rather than being a distinct stage of risk management. The *M_o_R* guide underscores the importance for and dependence of risk management's success on properly planned, established and documented communication. The development of a communication plan is specifically mentioned in the guide and a description of a communication plan is provided in an appendix.

Since the *M_o_R* guide is based on the *ISO 31000* standard, the differences between the risk management process model offered in this guide and in PMI's risk management framework are very similar to those between *ISO 31000* and PMI's framework. The *M_o_R* also distinguishes itself from *ISO 31000* in its focus on practical application. Unlike the *ISO 31000* standard, which focuses on generic risk management principles, the *M_o_R* guide presents actual risk management techniques, describes risk documents and discusses risk management in greater detail.

2.5 Selection of Risk Management Framework

PMI's framework has been selected for this project for several reasons. First, PMI is the largest project management organization in the world and its standards have achieved extensive exposure and worldwide acceptance. Second, these standards have been developed by volunteer project management professionals from various industries (many if not most of whom hold the PMP certification). Finally, PMI is actively involved in the ISO/PC236 project committee and ISO/TC258 technical committee, which are currently developing project, program and portfolio management standards, so it is likely that future ISO and PMI project and risk management standards will be even more closely aligned.

CHAPTER 3. DEVELOPMENT OF A TRANSLATION-SPECIFIC MODEL

3.1 Introduction

As discussed in the preceding chapters, the model developed for use in this dissertation is based on PMI's risk management framework. Since this framework is generic, its constituent processes can be applied to projects in any domain, including translation and localization. Likewise, the principles and critical success factors for risk management described in the PMI's *Practice Standard for Project Risk Management* are also generic enough that they can be applied to any organization. What must be tailored to the organization are the specific tools used by project managers to facilitate the implementation of risk management. Tools that facilitate risk identification, such as organization-specific taxonomies of risk sources, are particularly important in this respect.

Risk analysis and the development of responses are what prepare the project manager to manage risks in a project. However, as Williams writes, "Before risks can be quantified, it first needs to be decided what the risks are. Little structured work has been done either on ensuring completeness or on eliciting such risks from experts" (T. Williams 1996, 25). Effective identification of risks, no matter how it is approached, requires that:

1. the project manager understands the project itself and the constraints that shape it: scope, budget, timeline, requirements, stakeholder needs and so forth;
2. all members of the project management team participate in the risk identification process; and
3. risk identification is carried out in a systematic manner and iteratively to ensure that a maximum number of risks are exposed, including new, residual and secondary risks. Conversely, any non-relevant risks must be excluded.

3.2 RBS for Translation Projects

As discussed in the second chapter, a Risk Breakdown Structure (RBS) is a tool that can facilitate the process of risk identification and make it more systematic and structured: "It [RBS] can act as a framework to structure and guide the risk management process" (Hillson, Grimaldi, Rafele 2006, 62). A number of sample RBS are presented in the risk management literature review. (A brief listing and description of several RBS is provided in the second chapter in section 2.1.4). The RBS proposed in this dissertation is based on the generic RBS offered by PMI (2008, 280) and some elements of the generic RBS offered by Cooper and al (2005, 357-367).

1. Activity-level sources of risk[6]
2. Project management-level sources of risk
    a. Estimating

[6] In project management, an activity is understood as "a distinct, scheduled portion of work performed during the course of a project" (PMI 2012).

   b. Planning
   c. Controlling
   d. Communication
   e. Inadequate project management
   f. Lack of project management knowledge/experience
3. Organizational level sources of risk
   a. Resources
   b. Prioritization and coordination
   c. Company management
4. External sources of risk
   a. Subcontractors and suppliers
   b. Regulatory and legal sources of risk
   c. Market-related sources of risk
   d. Customer-related sources of risk
   e. Weather-related sources of risk
   f. Force majeure
   g. Cultural sources of risk
5. Technical sources of risk
   a. Technical requirements
   b. Technology-related sources of risk
   c. Complexity and interfaces

d. Performance and reliability

e. Quality

3.2.1 Activity-related Sources of Risk

At the lowest level of the RBS are risk sources that lie within project activities. Language projects nowadays can include numerous and varied activities, such as translation, editing, interpreting, terminology development, review, cultural assessment, integration, localization engineering, desktop publishing, among others. Enumerating every possible activity is impossible and even if it was possible, addressing every single one of them cannot be done within the bounds of one dissertation. For this reason, translation is the only activity for which detailed risk sources will be described. Translation has been selected because by definition and by nature any translation and localization project always includes at least one translation activity. Sources of risks associated with translation represent the model in this case study.

The dominant paradigm in cognitive psychology that describes how the human mind works is an information processing model which can be generalized as: input → processing → output. This conceptual model of the structure of the human mind is based on an analogy between human mental operations and the processing of information by a computer. Since both risk identification and translation are forms of information processing, this generic model of cognition is a suitable foundation on which to create a structured approach to describing the sources of risk that originate in translation activity. This model of cognition [input → processing → output] can be

applied to the identification of sources of risks in translation activity in the context of translation and localization projects as follows:

1. *Input* represents the source materials received for translation
2. *Processing* represents the translation or localization process
3. *Output* represents translation project deliverables, such as translated text, translated content or localized software

Figure 3.1 contains a graphic representation of the proposed model. A detailed description of the model components is presented in the sections that follow. This model is generic enough that it can not only be applied to the translation activity itself, but can also be expanded and explicated for other activities commonly carried out in translation and localization projects, including but not limited to editing, quality checking and multilingual desktop publishing. The decision to confine the model to translation is motivated by the fact that translation is an activity performed in all translation and localization projects, as mentioned earlier. Consequently this model is broadly relevant; at the same time, since it is not highly complex; the scope of the model remains manageable.

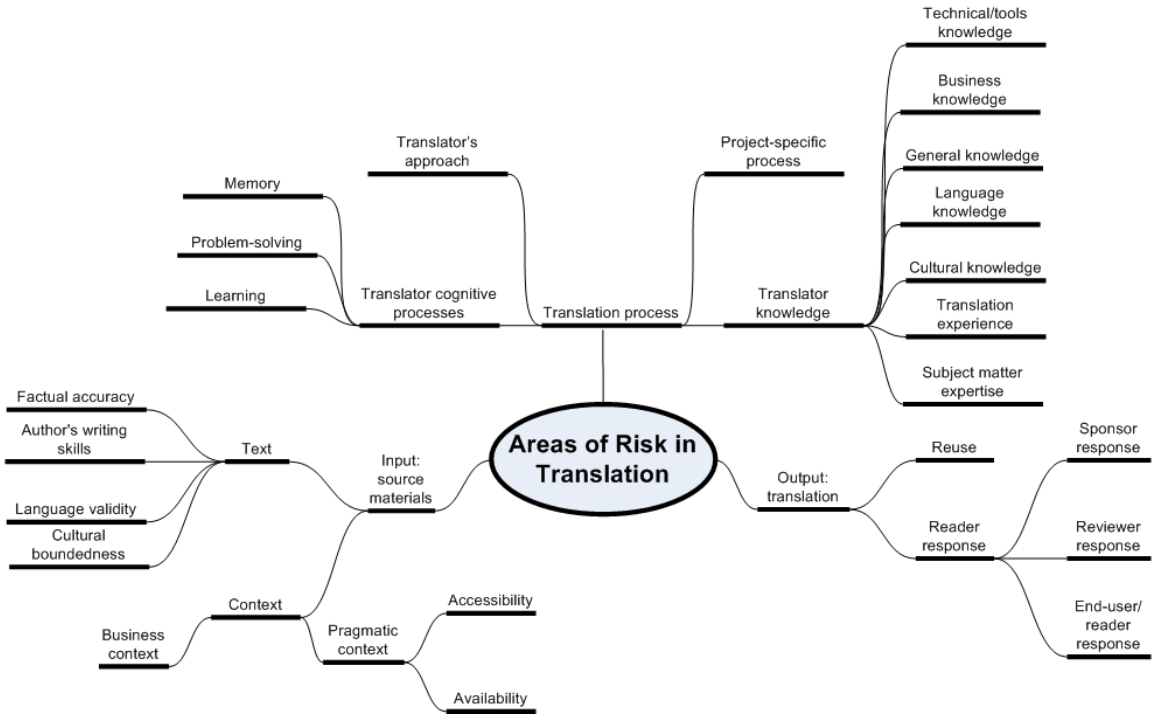

Figure 3.1. Preliminary model of risk sources for risk identification in translation and localization projects

3.2.1.1 Input

The input to the translation process is the source text, which may be in digital format or hard copy. Input represents a fertile ground for potential risks. Source materials are typically authored before the translation project is formally initiated and without any involvement on the part of the translation team. Sometimes, the materials are written without translation in mind. In addition, the translation team is typically confronted by a certain number of unknowns that stem from lack of information about the source material authoring processes. For instance, the translation team may not know (and may not be

able to find out) whether the source materials were edited; whether any existing style guides or terminology databases were used during the authoring of the source materials; the business context and the business objectives driving the creation of the materials; the linguistic and extralinguistic context(s) that must be taken into account when translating; among other factors. These "known unknowns" (Cleden 2009, 13) will become risks when the project begins, as they represent uncertainty that can affect the goals and objectives of that translation project.

Sources of risks associated with the input to the translation process can be broken down further as follows:

1. *Text* (understood generically as any type of content being translated and as not necessarily linear).
    a. *Factual accuracy*

If the source text contains factual errors, these errors can be accidentally replicated by the translation team(s) in the target language(s), if they are not detected and resolved in time. In the ideal world, the source materials would be perfect and contain no errors. However, the reality is such that error-free source cannot necessarily be guaranteed by the buyers of translation services. If the errors are present, translation teams might not be able to detect them, which could be due to lack of expertise in the domain, lack of experience with the product/service that is described in the source text, or the error that is not easily recognizable as such. While translation teams or companies cannot be held responsible

for the errors that stem from the source, the presence of such errors still poses risk to the project.

For example, in one of the localization projects that I managed, a translator discovered an error of order of magnitude in formula calculation in the source. This error would have caused a significant damage to the customer's reputation and could have meant potential law suits. However, it was discovered during the translation and corrected. This risk event had several impacts on the project: (a) additional work and time, though minimal, were required to correct the error across the target; (b) while the source did not have to be corrected at that point of time, a discrepancy between the formulas in the source and target segments of the TM had to be addressed to ensure that the TM can be effectively used for future updates; (c) the vendor-customer relationship was improved, as the customer was impressed by and appreciative of the level of focus and expertise that the translation team brought to the project.

b. Author's writing skills

The quality of the source text depends on the author's writing skills. How well, or not, the source is written; whether the writing style reflects the appropriate text type; whether the source text contains ambiguities and other issues that might lead to misunderstanding of the text meaning—all these can be sources of risk. Even when translators are highly fluent in their source language (which is often their second or third), are keeping abreast with the source culture and are proficient in their domain, there is still room for misunderstanding of the source that can lead to mistranslation. Ideally,

translators have direct or mediated access to content authors, so that they can ask questions should they run into ambiguous areas in the text, but in reality it is not always easy. The author(s) might no longer be available or they might have no time or desire to respond to the questions. Moreover, translators themselves might be reluctant to ask questions due to time pressure that might exist in the project or lack of motivation to do so and instead would proceed to make their best guesses about the meaning.

Finally, there is currently a trend in technical writing to outsource authoring of English content to the lower cost markets, where technical writers are not native speakers of English. While they might be highly proficient in the field and fluent in the language, the content that they produce might still contain interferences from their native language and other deficiencies that could require more time and effort on the part of translator during the comprehension stage of the translation.

c. Language validity

While the presence of linguistic errors in the source would not typically impact translators' comprehension of the source text, some of the errors might. In addition, a text laden with linguistic errors or inconsistent terminology might slow down a translator or cause him or her to question the source more than s/he would do otherwise. On the other hand, a source text containing linguistic errors can present an opportunity for a language service provider for offering proofreading or similar services for the source.

d. *Cultural boundedness*

If the source text contains many cultural references that require extensive adaptation, it poses a special challenge for translators and can be a source of risks. Translators might not be willing to take risks with adaptation and be more literal in their translations, while the project requirements dictate otherwise. Or, translators might be adapting too much to the source culture, when more literal translation is desired by the customer or the customer does not like how adaptation is carried out.

2. Context

a. Pragmatic context

- *Availability*

Availability of context, especially with the current trend toward single-sourcing and separation of form and content, could be a challenge. Sometimes, there is no actual linear text—there are content chunks that get combined at runtime or during the integration process, so the context might not even exist until the final output has been created or is viewed by the reader or end user. In such cases the separation of form and content and content chunking makes the availability of context a must. At the same time, it makes providing that context a challenge.

- *Accessibility*

Even if the context is available and can be provided to the translation team, it might still be not easily accessible. For example, in a localization project, locating where a particular string or a menu item occurs in the interface of the running program might not be easy,

especially if the authoring approach did not take into account that the software will be localized.[7] Even worse, the developers might have made a decision to alphabetize all the strings when providing them for localization making it virtually impossible to quickly access the context; or they might have reused the same string or user interface item in different contexts, making translation of that string or item a challenging, if not an impossible task.

b. *Business context*

Understanding of the business need that the customer is trying to meet by carrying out a particular translation project is critical for many reasons, including the fact that this need (or needs) can be a source of risk to the project. For example, use of a source text that is not appropriate for the purpose of meeting the business need, might mean that the target text must be adapted more or the source text needs to be rewritten or replaced.

3.2.1.2 Translation Process

The process of translation is subject to risks that may stem from the translator (i.e., the translator's knowledge and cognitive processes), the translator's approach to the translation task, or the processes that must be included in translation due to the specific project requirements.

The translator's cognitive processes are sources of risk for several reasons. First of all, what happens inside the translator's mind during translation is still poorly

[7] "In programming terms, a string is a group of characters that is stored and manipulated as a group" (Heimburg 2006: 139).

understood. Extensive research has been conducted on human cognition in general, but much remains unknown, including how the decision-making process occurs; how exactly human memory works; how people acquire knowledge; how the knowledge one has can be evaluated and whether the knowledge and experience one has is appropriate and sufficient for the task at hand; and so forth. Empirical research has not yet provided answers to these questions.

Second, as discussed in the first chapter, translation is a decision-making process that takes place under conditions of uncertainty. That uncertainty exists on several levels. For example, the translator may be uncertain whether a given phrase means 'a' or whether the author intended to say 'b.' Some of that uncertainty is reduced during the process of translation. As the translator makes decisions about terminological choices, for example, the range of choices for subsequent terminological decisions is reduced, facilitating the translation process, and by extension, the work of the translator. Uncertainty is present not only in source-text comprehension, but also extends to target-text production. For instance, when translating a sentence, the translator may be uncertain whether a given term is the one preferred by the customer, reviewer or target reader (in other words, by the person or people who will be assessing whether translation meets their needs). Even if the translator has a high degree of confidence in such decisions (having reduced uncertainty by using certain reliable references, resources, parallel texts and the like), these decisions may still include some element of prediction. Even when people make decisions with a high level of confidence, predictions may still be only

marginally better than random guesses. “The confidence we experience as we make a judgment is not a reasoned evaluation of the probability that it is right,” as Kahneman observes (2011). Finally, uncertainty is inherent in the performance of those who translate since human performance can never be predicted with complete certainty. Even under identical conditions subject to the same variables and environment, performance is subject to common cause variation.

There is currently no standard method of assessing translator expertise. Moreover, there is no consensus between translation scholars what constitutes translator expertise or knowledge. For a project manager who is selecting a team of translators, determining who is qualified or not is therefore a task that presents significant risk.

Translators do not all work the same way or share the same concept of what constitutes translation. Some translators may start a project by reading at least a portion of the source text, performing research on the topic and finding relevant reference materials. Others may start the same project by compiling a glossary, or simply open the source text and start the translation without even looking at the project instructions. For a project manager, especially one managing a project that requires that the translator follow a specific sequence of actions and/or guidelines, the translator’s work habits may constitute a source of risk.

Each project is unique and can have its own requirements. Translation is carried out in order to meet specific goals and objectives (ideally, identified during the project

planning stage); any deviation from these goals and objectives, whether real or perceived, presents risks, making the translation process an inherently risky activity.

The risk areas associated with translation processes and participants in translation processes can be subdivided into the following groups:

1. Translator's cognitive processes

a. Memory

Stylistic and terminological consistency in certain text types are not just necessary, but are crucial to the purpose and function of the texts. Ensuring consistency of stylistic and terminological choices in the translation (or translation of related texts and projects) means reliance on translator's memory. Much of the risk that stem from this source is mitigated nowadays by use of translation memory and terminology management tools, but not all of it. Stylistic elements are harder to capture in these tools; the tools might not be used in a project at all; or, even if the tools are used, but are not carefully maintained, they might contain and propagate inconsistencies.

b. Problem solving

Translation is a problem-solving activity. Translation problems could be a choice of a target word or phrase, creating a new term if a concept is new to the target language/culture and a target term does not exist, deciding on the target sentence structure or the structure of the document, and so forth. A translator's ability to identify and solve these problems is a key to producing a successful translation and is therefore an area of risk.

c. Learning

Uniqueness of projects and inherent uncertainty mandate that those involved in any project must learn in order to succeed. Translator's ability to learn can bridge the gap between what s/he does not know and what s/he needs to know in order to complete the project. Lack of that ability can undermine the quality of the resulting translation. Learning is not just limited to understanding of the source. A translator's learning must go beyond the text and even pragmatic variables of that text; s/he must learn about the product, service and/or technology described in the text; about project requirements; about project stakeholders, specifically, target readers and reviewers, and their needs and expectations and more.

2. Translator's knowledge

Related to learning ability is the translator's knowledge. One of the biggest current challenges in the industry, and therefore one of the areas of risk, is the assessment of the translator's knowledge and skills. As has been mentioned earlier, there is currently no standard, agreed-upon way of carrying out translator assessment. It is also unlikely that there ever be one, because companies, organizations or translation programs that have created an approach to assessing translator skills that produces consistent and reliable results consider that their competitive advantage and capitalize on that. Having such an assessment presupposes that the company, organization or a program have a model of the type of knowledge that is required of a translator. Categories of knowledge suggested below represent one such view on the types of knowledge that are sources of risk.

a. Technical tools knowledge

Contemporary translators work in a digital environment that requires knowledge of technical tools, from general tools such as Microsoft Office applications and Windows platform, to specialized industry applications such as computer-assisted translation (CAT) tools, localization tools, terminology management tools, corpus tools and so forth.

b. Business knowledge

Business knowledge refers to the business context in which the project is performed; assumptions and constraints that are relevant to the project and project context; how the project fits into the company strategy (if it exists); stakeholder needs and expectations and other business variables.

c. General knowledge

General world knowledge, for example knowledge of scripts or scenarios (such as what happens when one goes to see an alternative band playing in a bar or to a bank to open an account) is necessary for comprehension of the source text.

d. Language knowledge

The knowledge of both the source and target languages is an obvious source of risk, since the linguistic knowledge in both languages is a pre-requisite for translation to be carried out.

e. Cultural knowledge

In addition to the linguistic knowledge, the knowledge of the source and target cultures is a necessary part of the equation for the translator.

f. Translator's experience

While some knowledge about, for example, text type or a project type, can be acquired in a classroom or through reading, much of it can only be gained through experience. Lack of translator experience, for example, with a localization project, can introduce threats to a project, while presence of an experienced lead translator in such a project can offer benefits and opportunity for others on the translation team with less experience to learn from him or her.

g. Subject-matter expertise

While expertise in a specific subject (or several domains) is a desirable, if not a mandatory criterion for a project manager who is putting together a translation team, most translators are generalists and might not necessarily have years and years of experience in a specific narrow domain. In addition, the combination of the language pair and subject matter expertise might narrow the pool of potential team members or even make it impossible to staff the project.

3. Translator's approach

Translator's approach to the translation process and his or her translation philosophy could pose risks to a project. How does the translator view his or her job? Does s/he have his/her own work standards? Does s/he reflect on his/her work? What are his/her beliefs about translation? All these questions provide an understanding of how a translator approaches her or his work. Moreover, some personal beliefs might impact on how translator works, for example, a translator might decide to turn down the project or part

of a project at the last minute, if s/he has a strong contrary opinion to the one that is expressed in the text.

4. Project-specific process

A project might have specific steps, procedures and general approach that the translator must follow. These requirements can be well identified, documented and communicated to the translator, but s/he still has to understand and follow them judiciously. Project-specific processes can be a source of risk, for example, if they are too detailed, if they are not documented enough, if they are not followed, or if they are incorrectly identified or are not followed for any reason.

3.2.1.3 Output

The output, that is, the translated materials themselves which are delivered to the client, can also be a source of project risks. The use or uses to which deliverables and sub-deliverable outputs are ultimately put may also represent sources of risk that can affect the objectives and outcomes defined for the project. The translation vendor's liability and responsibility with respect to the translation ends with the delivery of that translation to the client. In fact, LSP contracts typically contain a formal stipulation to this effect. The specification by the client of project requirements, such as the target audience and the intended use for the translation, as well as the medium through which the translation will be distributed, is both a best practice and an expectation on the part of the LSP. However, there is no guarantee that such information will indeed be communicated or will be communicated accurately to the LSP before the project is initiated. There is also no

guarantee that these requirements will not change between project launch and completion, or even that the client will use the final product or products as specified in the requirements. Thus, after receiving the translation the client may decide to use the translation in a different format, for a different audience, or in a different context. Such reuse of translation can be facilitated by the authoring approach, as in single-sourcing, in which there is no linear text and chunks of text are assembled on the fly into end-user documents based on the required output format or purpose. Changes in the format of the output or the context of use may render the initial translation and the original choices that the translation team made inappropriate for use without revisions. The client may not realize the danger of such reuse until the risks presented by the inadequate translation become issues. In such cases, the LSP is typically blamed for the problems. Even if the LSP has disclaimed liability for such situations in the contract, the company's reputation and its relationship with the client may still suffer. However, such situations can also be turned into excellent opportunities for the LSP to provide additional service support, consulting or education to the client.

In sum, uncertainty may exist even after the final output of the project has been delivered to the client, which can present risks if goals and objectives of the original project are impacted in any way. Specific areas of output-related risk may include:

1. *Reuse*

With the current push toward single-sourcing, internationalization, and structured authoring, translators and translation companies see more and more projects in which

they receive chunks or sections of content, as opposed to actual linear text. Such chunking and separation of form and content reinforces idea that these sections of text are independent of each other, have a life of their own and can be reused. However, such reuse of translated content might not necessarily involve review, approval or consultation with the translation team.

The need to reuse and the reuse of content are sources of risks. They can provide opportunities for additional work or input by the translation team and/or customer education. But they can also open doors to embarrassing and costly errors, especially if the translation team is not consulted.

2. *Reader response*

The terminological, stylistic and other choices that the translation team makes during a project, might need to satisfy the needs of several parties, such as the (a) project sponsor, (b) reviewer or (c) end-user/target reader. These stakeholders might have differing or even conflicting expectations, making the task of meeting those expectations a delicate balancing act.

3.2.2 Project Management-Level Sources of Risk

Project management is not a discrete activity, but rather incorporates multiple activities and processes; each contains some level of uncertainty and may therefore be a source of risk. Thus, estimation of scope, cost, time and resources is always a source of risk, since the project manager can never be fully confident about the accuracy of such estimates until after the project has been completed. Most translation companies work under fixed-

price contracts. Fixed price is not indicative of complete certainty of the companies with respect to the budget or schedule, but rather reflects those companies' level of risk tolerance, because fixed-price contracts are based on *estimated* scope, budget, schedules and resources.

Planning is critical for project success. The purpose of planning is to reduce uncertainty related to the management of scope, cost, schedule, resources, quality, risks and communications. Since project management is iterative, estimation and planning can and often are performed multiple times during a given project as new or updated information becomes available that allows for refinement of initial estimates and therefore reduction of uncertainty. Each iteration of estimation and planning brings the project into clearer focus. The initial project plan lays the foundation for specifying how the project will be executed. It also serves as the baseline against which the progress of the project will be measured during project execution. A project plan is essentially a model of project execution. As such, it presents inherent risks.

Communication failure is the root cause of many problems, including certain risks that arise in a project. Communications-related sources of project risks may include project communications management processes, such as stakeholder identification, communications planning, information distribution, expectations management and performance reporting; as well as communications channels, communications reliability and communications security.

Finally, the lack of project management knowledge, skills, tools, techniques or experience, as well as inadequate application thereof, can introduce risks into the project. For example, the project manager may not have sufficient knowledge, skill or experience to plan or carry out project management processes. But even if the project manager does possess sufficient knowledge, skill and experience, the failure to properly and adequately apply them when carrying out project management processes can hinder the effectiveness of those processes. For instance, if the project manager identifies risks at the beginning of the project but does not plan responses, does not implement planned responses when the risks are triggered, or does not review the risks later in the project to determine if some risks have been eliminated and/or new risks have arisen, then the effectiveness of risk management will be undermined.

3.2.3 Organizational Sources of Risk

At the organizational level, risks can arise from resources, prioritization and management. Unexpected changes in project funding and the organization's overall cash flow can impact the project. For example, if part of the project was supposed to be funded in advance but there is a delay in that payment, the acquisition of certain project resources may be delayed, the cost schedule may shift, or the project schedule may need to be revisited. The organization's cash flow can also place additional constraints on the project, especially given the fact that cash flow problems, and the timing thereof with respect to a given project, cannot always be predicted with a high level of certainty.

Project human resource-related risks include lack of availability and turnover. In addition, the expertise, skills and/or training of project team members may or may not be sufficient. These sources of risk are relevant in relation to both in-house staff, as well as subcontractors. However, subcontractors present a wider range of risk sources, which are discussed in further detail below.

Risks to a specific project can stem from the need to coordinate human resources internally (similar to the need to coordinate material and financial resources). Prioritization and coordination of the organization's goals and objectives is a challenge that requires the project manager and his/her superiors to balance dependencies between projects within the organization. This challenge is magnified if entities within the organization formulate competing goals and objectives. For instance, if a localization engineer is scheduled to work on project A, but the company management makes a strategic decision to prioritize work on project B, which requires the involvement of that same localization engineer, project A will be at risk of being delayed.

Finally, management can harbor sources of risks. For example, a lack of appropriate procedures or guidelines may result in project managers in the company carrying out certain activities inconsistently or ignoring those activities completely. Inappropriate organizational structure (or lack of an organizational structure) can also be an issue, especially in small translation companies, where, as mentioned in Chapter 1, there is almost no hierarchy. As a result, it can be challenging for the management to create an environment that on one hand offers employees potential for growth, and on the

other hand allows for the creation of a reporting structure that imposes checks and balances on the employees. Project managers do not merely feel disempowered if they are given project responsibilities but no authority to make relevant decisions; they may actually be set up for the project failure from the start. This situation commonly manifests itself in translation and localization in the form of project whose proposal is drawn up by the sales department without consulting the PM or production staff; the PM is then forced to work within the constraints imposed by the proposal. In the worst-case scenario, the sales department sells a project that the PM and the production staff cannot possibly deliver, a so-called "death march project" (Yourdon 2004).

Finally, the knowledge that employees gain on the job, or, rather, the loss of that knowledge when employees leave or are unavailable for some reason, is also a source of risk for a company. Enterprise knowledge management is a challenge in any large organization, but it is especially risky area in small companies, where the knowledge often resides with a specific employee. If there is no formal way of documenting and managing employee knowledge, it can be easily lost if a staff member leaves the company or becomes unavailable for whatever reason. If the knowledge of a given employee constitutes the company's competitive advantage and that employee leaves, then the competitive advantage is lost as well.

3.2.4 External Sources of Risk

Sources of risk can be external to the organization. Such sources may reside in the availability of, selection of, or relationship with subcontractors, suppliers and customers.

Risks can be originated by new, existing or non-existing regulations and laws; market forces; weather; or circumstances of force majeure. Finally, risks are inherent in any situation in which the culture of external organizations or stakeholders clashes with what is expected by those within the organization.

3.2.4.1 Subcontractors and Suppliers

The label "translation company" is often a misnomer. In fact, many translation companies do not actually carry out translation, but rather manage translation projects and outsource language-related services such as translation or editing. Consequently, the risks associated with subcontractors and suppliers conceivably comprise the largest group of external risks.

The subcontractors' ability to deliver the work (e.g., translation or editing) at the appropriate level of quality, reliably and on time is of primary importance to any company or client. While timeliness and reliability are easy to assess, assessing the skill level of a translator or editor is a challenging task. Currently, there is no one standard in the language industry that addresses the assessment of translation skill(s). Many companies rely on external bodies, such as educational institutions or translators associations to assess and certify translators. However, the fact that a translator is certified by an organization, institution or a government does not necessarily mean that he or she will perform better in a given project than someone who is not certified. Certification indicates that the translator demonstrates a certain level of commitment to the profession and that he or she has successfully complied with the certification

requirements, whether by passing a test or exam, by presenting a documented track record of translation experience (as in portfolio certification), by filing the necessary paperwork in the required manner, or by meeting some other requirement. Moreover, every project is unique; thus, the translation skills required in a given project may be quite different from those required (or assessed) by the certification exam. For example, the certification test given by the American Translators Association (ATA) includes one general text and one specialized text. The fact that a translator successfully completes a specialized text on the structure of a mineral during the certification exam does not necessarily mean that he or she is qualified to translate the user interface of a medical software application. Even if a translator does hold a certification, the project manager still does not truly know whether that translator has the requisite skills for the specific project at hand and thus the project manager must carry out additional assessment.

It must be noted that in existing certification and assessment programs the skill of a translator is not assessed directly, but rather indirectly via the "quality" of the target text. Target text quality has been discussed by many translation scholars and language industry practitioners. Both quantitative and non-quantitative approaches have been proposed. Among the quantitative approaches are SAE J2450 (SAE International 2005), SICAL, an unpublished internal standard developed by and for the Translation Bureau of the Government of Canada (1986; cited in M. Williams 2004), the ATA Framework for Error Marking (American Translators Association 2009), the LISA QA model (2004) and Willams' argumentation-centered approach (2004). Non-quantitative approaches include

Reiss' functionalist model (2000), Nord's *Skopos* theory (1997) and House's descriptive method (2001). Few of these approaches have been successfully implemented in professional projects. SAE J2450 is used in the automotive industry and is designed exclusively for assessing the quality of the translation of automotive service information, in which style is not important. However, some LSPs anachronistically apply SAE J2450 to non-automotive projects without any modifications. The ATA Framework is used to assess the ATA certification exams and is also used by faculty in some universities to provide feedback to translation students. The LISA QA model was developed by the Localization Industry Standards Association in the late 1990s. Some companies have attempted to implement it (see Koo and Kinds 2000 for an account of such one experience) but success stories are still to come (or not). SICAL and a few other similar models (and modified versions thereof) are used by the Canadian Translation Bureau.

Although translation is a profession with low barriers to entry that does not require practitioners to pass qualifying exams, such as those required of lawyers, financial planners and physicians, the pool of human resources available to translation companies is in reality far less vast than it appears at first glance. After factoring in language pair, domain specialization (or, more frequently, a combination of specializations), and any other necessary project requirements, such as certification, number of years of experience and the nature of that experience, knowledge of tools, and specific geographic location, the seemingly large pool of available translators, editors or terminologists shrinks rather quickly.

Even if several available subcontractors are qualified for a specific project, have proven themselves to be reliable, and meet other project requirements including budgetary limitations, the availability of these suppliers cannot be guaranteed for the duration of the project. For example, subcontractors who have committed to a project may need to withdraw before the project is completed due to illness, injury or family emergency, to cite but three possible reasons. Since the availability of subcontractors cannot be taken for granted even after they signed a contract, the availability of backup suppliers is another issue with which the project manager must contend.

The subcontracting chain in the language industry ends with freelance translators. This means that the project manager must consider risks such as lead times, warranty of services and the payment history of the subcontracting organization. Freelancers are likely to work with multiple clients but may be unable to support more than one client at a time during periods of peak demand. Consequently, it is important that the LSP, and by extension, the project manager, plan some lead time prior to the launch of a translation project. Failure to plan lead time may cause problems in the event that the LSP is unable to book its usual subcontractors and is forced to search for new or replacement resources. Freelancers typically do not provide warranties of services, but some LSPs do. For this reason, should an LSP be called by the client on its warranty for the project, the LSP will likely have to fund any warranty-related work out of it own profit margin. Finally, if an LSP has a poor track record of paying its freelancers on time, freelancers will be less likely to take on new projects. In the Internet era, word of poor payment practices on the

part of LSPs spreads very quickly, especially in such close-knit groups as freelance translators. There are even groups and websites, such as Payment Practices (http://www.paymentpractices.net), devoted specifically to tracking LSPs that do not pay subcontractors in a timely fashion.

3.2.4.2 Regulatory and Legal Sources of Risk

Like any other professional service, translation is subject to regulatory and legal risks. If a company has a standard service agreement, any change to the conditions of that agreement in a specific project or in all projects undertaken on behalf of a specific client can pose risks that the project manager must contend with. These risks can range from the project manager's ability (or inability) to remember and meet new terms to costly legal advice that may be required by the service provider as it evaluates new terms before signing the contract.

Other contractual issues include the failure of subcontractors to read the terms and conditions of their contracts before accepting a project; warranties offered by the translation company; any sort of quality requirements that must be met; and other specifications to which the service provider must adhere. Such issues increase project complexity and thus can be sources of risk.

Professional service firms, including translation and interpreting companies, can purchase errors and omissions insurance. However, small firms and freelancers are often unwilling or unable to shoulder the cost of such insurance. Not having such insurance

leaves the company and freelance translators vulnerable to potential lawsuits, unless they formally disclaim or limit the scope of their liability for errors in their contracts.

Some companies offer warranties against errors in translation. While such warranties may be reassuring for customers, they constitute a significant source of risks for the vendors who offer them not only because it can be costly and time-consuming to fix errors should they occur, but also because the very definition of what constitutes a translation error can differ between the buyer and the seller of the translation services.

Aside from insurance, warranties, specifications and licenses, there is another area of risk that is inherent to the very nature of the translation business. Those offering and buying translation services often operate across borders and in different and possibly unfamiliar legal environments. While the terms of a given translation contract may address many of the issues discussed above, an LSP may have no means to enforce the terms of the agreement or legal recourse should something go wrong.

3.2.4.3 Market Risks

Like any other business, a translation company is subject to market risks, such as fluctuations in inflation rates, interest rates, exchange rates and taxation. Translation companies must also successfully manage market forces, such as pressure from competitors as well as the need to innovate and keep abreast of technological changes. Finally, companies must balance the imperative to maximize sales and revenues with the constraints imposed by finite staffing levels, lest they commit to more work than they can

reasonably deliver in a given amount of time and thus find themselves dangerously overextended.

3.2.4.4 Customer Risks

Customer-related risks, such as the customer's inability to pay in a timely fashion or meet its commitments due to bankruptcy, failure of the business or change of ownership are risks that any firm or an individual faces when conducting business. However, customers present other sources of risk that sellers of translation services might not think about or even be aware of until the risks occur. For instance the customer may misunderstand or may fail to accurately communicate critical information about (or changes to) the project scope, schedule or quality requirements. The customer may also have unrealistic expectations about the project scope, schedule or quality requirements.

Customer schedule requirements may be hard to meet and it can be a challenge to estimate the work effort required by activities such as translation and editing. As Dunne points out, multiple factors can affect the daily output of a translator or an editor, including the availability of a reliable TM, termbase and/or corpus of reference materials; a history of performing similar work for a particular client; the project size; the number of files; the relative linearity of the text; the number of cultural issues presented by the text; the use of proven technology; the number of repeated segments (sentences) within and across files; the factual accuracy and the consistency of the source text; and so forth (K. Dunne 2011,131-132).

Defining and communicating scope and quality requirements in a translation project present particular challenges. There currently exists no standard that offers guidance for estimating the scope of the product in a language project. The de facto standard method in most countries is to estimate the scope of the work effort based on the number of words in the source text, and sometimes based on the number of words in the target text. In some markets, the scope of the work effort is estimated based on lines of text (e.g., Germany) and in others based on the number of pages of text (e.g., Russia, although this is not a universal practice).

Using the word as the basis for determining the scope of a translation project is problematic for two reasons. First, not all words are equal when it comes to the work effort required to translate them. There is a big difference between translating a 1,000-word poem and the assembly instructions for a child's swing of the same length. Simply counting words and basing project plans on that word count is insufficient for describing the true scope of the work effort required to complete a project. The second challenge is more fundamental. What is a word, especially a translatable word? This problem is not just of philosophical nature, but also of a practical one. Words are counted in translation projects using software, rather than by hand. Different translation software applications count words differently, which may result in discrepancies between the total word count in a given document, if that document is assessed by the seller of the translation services using one application and by the buyer of the translation services using another application. Differences across tools stem from decisions made by the developers of

those tools when writing their word-counting algorithms. These algorithms reflect what the software developers deem to be a word. For instance, when creating word-counting algorithms, software developers must decide whether or not numbers should be deemed words and be included in the word count. Numbers should be included in word counts when translator need to modify the format due to the use of different decimal separators or grouping conventions (e.g., 1,525.9 in the U.S. becomes 1 525,9 in France) or spell them out instead of simply replicating them in the target languages. Numbers that are replicated without modification (such as numbered list elements) should not be included in the word count. Since it is often a judgment call what to include or exclude from the word count, it is impossible for programmers developing word-count algorithms to take into account every possible condition in every language. In addition, what is considered to be a word can differ from language to language. For example, Korean has words, but Chinese and Japanese do not. These languages use ideographic characters that must be counted rather than words. Often, word counting software considers any group of characters that is preceded and followed by a space to be a word. However, the assumption that words are bounded by spaces is problematic when it comes to languages such as Thai, in which words in sentences are not separated by spaces. Finally, even in the English language it can be a challenge to decide whether a given item constitutes one word or several, as in the cases of abbreviations, acronyms, and words written in camel case (i.e., title case without spaces as in NonCurrentLiabilities). An example will help to illustrate why this is a source of risk in a translation project. Suppose that a translation

company only uses word count analysis when estimating the scope of a project that contains thousands of words written in camel case and/or abbreviations. In this case, the translation company is significantly underestimating the project scope and the work effort. Consequently, the project activity duration estimates will be inaccurate, which in turn may jeopardize the timely delivery of the project.

The Localization Industry Standards Association (LISA) attempted to address this problem by creating a formal standard for counting words: Global Information Management Metrics–Volume, or GMX-V (LISA 2010). After several years of development, an initial draft of the standard was released in January 2011, but LISA was disbanded in February 2011 before the standard was formally ratified. The committee that worked on the standard acknowledged how problematic the word counting issue is: "Unfortunately different tools can provide radically different counts for the same text: in tests run by LISA, word counts provided by tools commonly used in the translation process were found to differ by up to 30%" (LISA 2011). Work on the standard was resumed after the demise of LISA by the European Telecommunications Standards Institute (ETSI). A draft version 2.0 of the standard was published in January 2012.

Both project schedule requirements and project scope affect the quality of the project's output. And quality requirements themselves present problems in translation projects due to the lack of standards and the difficulty of defining quality requirements. In order to communicate project quality requirements, those requirements must first be identified, defined, and later, assessed. As Dunne observes, "[t]he quality of language,

communication, and meaning do not lend themselves well to objective quantification using scientific methods" because "[q]uality is not an absolute, but rather reflects the customer's or user's *perception* of the product" (K. Dunne 2009, 218). Dunne suggests that quality is correctly understood as the characteristics of the product that shape the customer's or user's perception that the product meets the stated need and is fit for the intended use. These characteristics need to be jointly defined by the buyer and the seller of the translation. Those characteristics then need to be documented in the form of a specification, which can subsequently be used when assessing the final product. Such characteristics may encompass stylistic requirements, core terminology, and so forth. In absence of formally defined and agreed-upon characteristics, the customer has no objective means of effectively evaluating the quality of the end product. Common approaches to evaluating translation quality include in-house review and third-party review. However, if the defined characteristics are not used as the basis of the review, the review process may introduce a host of risks into the process. For example, if the review is subjective and preferential changes are mandated, the cost of the project will increase but the quality of the end product may not improve and may even be undermined. If extensive non-value-adding changes are requested, the review-remediation cycle may take longer than planned, which in turn could jeopardize the project timeline. Such situations can damage the relationship between the vendor and the customer.

Some other sources of customer-related risks include responsiveness and the company culture or attitude. Customer responsiveness is a critical success factor in

technologically and cognitively challenging projects. For example, if the translation team has questions during the project, but the customer cannot respond in a timely fashion, the project timeline will suffer and/or re-work may be required later. The customer's corporate culture or attitude also pays a significant role in facilitating (or undermining) potential project success. If the customer does not take translation seriously, then the company is unlikely to allocate sufficient budget or time for translation projects, creating undue pressure and presenting the translation team with unnecessary risks.

3.2.4.5 Weather and Force Majeure

In an era when technology allows those offering translation services to work from anywhere in the world, translation companies are still subject to risks resulting from weather conditions and force majeure.

3.2.4.6 Culture

Translation projects by their nature involve communication across languages, cultures, and time zones. For this reason, language, cultural customs and traditions, cultural attitudes to business and quality, time differences and holidays are all sources of risk in any translation project. For example, any project manager who has been in the industry for a few years knows that there is a major decrease in the availability of translators and editors working in Chinese, Japanese and European languages during the periods of the Chinese New Year, Japanese Golden Week and European July-August summer vacations. Planning around these major holidays or finding alternative human resources

who can guarantee their availability is a must for project managers who want to keep projects involving these languages on track.

3.2.5 Technical Sources of Risk

Technical sources of risk are not limited to technology and the challenges it brings, including potential performance and reliability issues, but also include the technical aspects of project requirements; project complexity; interfaces in a project; and the technical aspects of quality requirements.

Technical risks associated with requirements can include understanding of expectations of users, customers, reviewers and other stakeholders; identification of requirements on all levels, such as quality, scope, schedule among others; the level of detail with which the requirements are specified in the contract; and differences in expectations on the part of various stakeholders.

Technology solves many problems and empowers us to do more, work faster and cheaper, but also brings its own risks when used in projects. On a general level, every project manager must manage risks associated with the cost of technology, maintenance, training, availability and updates or changes. Specifically, translation project managers must consider risks associated with the following types of technology:

- Translation, terminology management and localization tools, such as SDL Trados Studio and MultiTerm, MemoQ, Across Language Server and Alchemy CATALYST among others

- Project management tools, such as Microsoft Project, Projetex, Plunet Business Manager, ProjectOpen, ClockingIt, etc
- General productivity software and platforms, such as Microsoft Windows and Office, Mac OS, FTP clients, etc
- Software used by customers to author and manage their documents and content, such as Adobe FrameMaker and InDesign, MadCap Flare, Content Management Systems (CMS), etc
- In localization projects, the software being localized adds another layer of complexity and risk to manage

The cost of purchasing, learning to use and maintaining these layers of technology can add up significantly. Moreover, certain types of technology do not exist or are not developed quickly enough to be able to support customers who use certain tools. For example, the computer-assisted translation (CAT) tool SDL Trados Studio offers filters to process content authored in Adobe InDesign so that the content can be translated in Studio and then automatically imported back into InDesign after translation, thus reducing the need to manually rework the layout of the translated piece. A new version of Adobe InDesign is released on roughly an annual basis. There is typically a 9-12 month lag between the release of a new version of InDesign and the associated Software Development Kit (SDK), and the release of a corresponding SDL Trados Studio filter enabling the processing of content authored in the new version of InDesign. Thus, if a customer upgrades to the new version of InDesign as soon as it is available for purchase,

it is very likely that SDL will not yet have released a filter to process the files authored in the new version of InDesign. In this scenario, the translation company will either have to ask the customer to work in an older version of InDesign, possibly foregoing features available in the new version of the software, or process the content manually, which will increase the overall cost of the project.

Complexity can be introduced to a project in various ways. For example, a project may be complex due of the number of components, people, activities, files and interfaces that it involves. Alternatively, a project may comprise only a few components, activities, etc., but involve a complex and/or unknown technology or a challenging combination of external factors, such as environmental, legal, cultural or political issues. Similarly, the more interfaces the project has, the riskier it tends to be. An interface is a form of communication channel. An increase in the number of channels means that the project has more areas that are exposed to risk.

Other technical sources of risks include those associated with the performance and reliability of the technology used in the project and also of the human resources that operate that technology. The reliability of the project team may be a less significant source of risk than the reliability of the technology if the team members are well screened and have a history of being reliable subcontractors. Nevertheless, team members' performance can be impacted by the nature of the project itself, by changes in their personal circumstances or motivation, by fatigue and by other factors. The performance of technology, on the other hand, is expected to be more uniform than that of people. Its

reliability, however, can vary, as technology is designed by people and is operated by people, who can err.

Finally, there are also technical risks associated with quality. Even if a project has been delivered on time and within budget, if the customer does not believe that the end product—translation—has the desired level of quality, then the project cannot be considered successful. As noted above, quality reflects the customer's or user's perception of the adequacy of the product. The subjective nature of quality, and the characteristics that shape the perception of adequacy, is probably the biggest source of risk in translation and localization projects. For this reason, a detailed discussion and specification of quality is a must to reduce the degree of quality-related risk. Even if the quality characteristics have been well defined and communicated to all stakeholders and to the project team, the execution of the project can impact how effectively these defined quality requirements are met. Scope changes and risks that arise during the project can make product quality a source of risks for the whole project.

3.3 Conclusion

This chapter presented a risk breakdown structure (RBS) with an extension developed for application in translation projects. The goals of developing such a model for application in a case study were several. First of all, a detailed RBS can be used to facilitate the risk identification project by project managers in a translation company by giving the process of risk identification a structured framework within which to work. For this reason, the

RBS was included as part of project risk management templates offered to the participants in this case study.

Second, the detailed explication of the model components serves educational purpose during the risk management training that was conducted as part of this case study. While many of the project managers have first-hand experience in dealing with various risks in a project, even if they managed just a handful of projects, it is unlikely (hopefully) that they have experience with the full range of risks in each category. Providing a comprehensive RBS to them is therefore an opportunity to raise their awareness of sources of risks that they might not have had the opportunity to experience or think of otherwise, without exposing them to those risks and allowing them to be more prepared in managing risks once they identify them in the real-world projects.

Finally, while I attempted to create a comprehensive RBS, this model represents only one person's view. Presenting a standardized tool such as this to the project managers who will be using it in their projects is the best way to identify the model's limitations and shortcomings. This model was presented to the project managers as a numbered list of categories in a stand-alone Microsoft Word document. The reason for not including it as one and only set of risk sources in the Risk Register document is to ensure that project managers do not perceive it as the only tool for identification of risks, rather than one of the tools that are available to them.

CHAPTER 4. METHODOLOGY

4.1 The Case for a Case Study

The goal of this dissertation is to explore how risk management can be implemented in the management of translation projects. The nature of this research poses several challenges. First of all, the research must be based on theoretical propositions. Second, seeking the answer to the question of *how* risk management can be carried out in real-life translation and localization projects requires that a model for risk management be developed and implemented. It also requires that the implementation be followed by analysis to evaluate whether and why the proposed model works or does not work. Third, implementation of risk management cannot be isolated from its context—translation projects. An out-of context experiment simply cannot account for the large number of variables that are important for risk management. Finally, this study relies on multiple kinds of evidence, such as documentation, interviews and quantitative assessments. Documenting risks and risk-related information is a core risk management process. Access to and review of such documentation can provide additional information to aid in the post-study analysis. In addition, interviews can provide extensive feedback about the model and whether it works for real-world translation projects.

Given the nature of the research questions, the grounding of the study in theoretical propositions (for example, the training conducted as part of this study draws

heavily from the first three chapters of this dissertation), the large number of variables and the impossibility of studying the phenomenon outside of its context, as well as the multiplicity of evidence and combination of qualitative and quantitative analyses, the most appropriate methodological approach is a case study. According to Yin:

1. A case study is 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.
2. The case study inquiry
    - copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result
    - relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result
    - benefits from the prior development of theoretical propositions to guide data collection and analysis. (2009, 18)

One of the strengths of case studies is that they can gather a wide variety of evidence (Yin 2009, 11). Case studies can include quantitative and qualitative data. Having a variety of data allows the researcher to present a more comprehensive of the phenomenon being studied and to describe it within its context.

In many industries, case studies, including case studies of risk management, are frequently carried out and used by businesses and organizations. For example, the FEMA Emergency Management Institute uses case studies for training (FEMA ETI 2011). Numerous case studies have been carried out in business, banking and finance (for example, Chong 2004, Zisa 2010, Bierman 2008, Lampel 2002, Peters and Waterman 1984), defense (Bodilly 1993, Camm 1993), engineering and IT (Niwa 1989, Roper

1999, McManus 2004), and other fields (Woods 2011, Abkowitz 2008, Jeynes 2002, Kerzner 2009).

4.2 Background Setting

It was important that the translation company selected for this case study be representative of the language industry. Since the majority of companies in the language industry are small, employing twenty of fewer employees, and less than two percent of language companies have fifty-one or more employees (Kelly, DePalma, Stewart 2012, 7), a small company was selected for this case study.

This case study was carried out in a small U.S.-based translation company that has been in business for almost 20 years and which will be further referred to as ABC Inc. The company offers translation, localization, desktop publishing, subtitling and terminology development services to corporate customers. The in-house staff at the time of this writing consists of a production manager, a localization specialist, two sales managers and four project managers, all of whom are full-time employees, as well as a part-time accountant. All language-related project activities (i.e., non-engineering activities or project management tasks) are outsourced to freelance contractors, such as translators, editors, proofreaders and terminologists, who are selected and hired for each individual project by the in-house project managers.

The company was one of the first translation companies in the U.S. to be certified under ISO 9001:2000 quality management systems. The certification helped to create and support a company culture that focuses on process and continuous improvement. Since

project management is at the core of the company activities and is its core competency, formalizing project management was a natural step for the company. In 2006, I was asked to prepare and conduct several in-services focusing on varying aspects of project management, such as time management, scope management, and communications management, to ensure that everyone in the company, including non-project management staff, was familiar with core project management concepts. As the project management staff expanded in the company, the need to develop more formal project management training (beyond simple short in-services) arose. Training in several project management knowledge areas was developed. The specific areas on which this training focused were scope management; cost management; time/schedule management; communications management; and vendor management. This training was conducted throughout 2011. Risk management training was planned but not conducted due to time constraints.

4.3 Participants

The participants in this study were project managers employed by ABC Inc. All of the project managers in this study have a Master of Arts degrees in Translation. During their studies, they took a one-semester course on Project Management with a focus on the management of translation and localization projects. During that course they were introduced to PMI's project management standard (the *PMBOK® Guide)*. However none of the project managers received further PMI- or project management-related training after graduation or before they accepted employment at ABC Inc. After commencing their employment at ABC Inc., the project managers underwent training on ABC Inc.'s

internal processes, documented as part of the company's ISO quality management system. In addition, in 2011, the project managers participated in in-house training that focused on various project management knowledge areas exclusive of risk management, as discussed above.

At the start of the case study, ABC Inc. did not employ any standardized risk management processes, nor did the company manage projects risks systematically. While risks were discussed in occasional projects, no systematic risk management process was developed or used at that time.

During the period this case study took place, changes occurred in the project management staff at ABC Inc. One of the project managers who took the initial risk management assessment and underwent risk management training left the company shortly after completion of the training to pursue an alternative career. However, she did complete the post-implementation assessment and was interviewed before her departure. Just before her departure, a new project manager was hired. The new project manager underwent full company training, as well as the risk management training provided as part of this study.

4.4 Design

To achieve the goal set for this study—to develop and implement a model for risk management—and to answer the questions of how risk management can be carried out in real-life translation and localization projects, a model of risk management was created, risk management training and an implementation plan were developed, the risk

management training was carried out and the model of risk management was implemented. A series of baseline assessments was undertaken prior to the training and implementation and another set of assessments was carried out after the implementation of the risk management program was completed. Qualitative data was also collected to solicit feedback about the effectiveness and appropriateness of the risk management training, risk management processes and templates. Several procedures and measures were employed. These procedures and measures, and the design of the case study, are discussed in detail in the sections that follow.

Prior to the development of the training and the implementation of the risk management program, guidelines were defined for the program. Specifically:

- objectives for risk management implementation were set;
- an implementation timeline was proposed;
- risk management responsibilities were described; and
- risk management processes were described.

4.4.1 Objectives

Several objectives were defined for the implementation of risk management at ABC Inc. The first objective was to contribute to the development of more mature project management processes within the company. The second was to use information about risks and their management to facilitate on-the-job training for incoming project managers, account managers and project management interns. The third objective was to

use information about risks and their management as an educational tool and resource to educate ABC Inc.'s customers in order to raise awareness of issues in translation and localization projects (for example, to educate clients as to the impact that their decisions have on translation and localization project schedules, budgets, the quality of the final product, and so forth). The fourth and final objective was to use information about risks to support business decision-making within the company.

4.4.2 Implementation Timeline

The tentative timeline originally proposed for the risk management implementation is shown in Table 4.1 below.

Table 4.1. Implementation timeline

Step	Time
Training	March 2012
Selection of appropriate projects	Ongoing, starting April 1, 2012
Application of RM processes and RM templates/guidelines in the selected projects	Starting April 1, 2012
Interviews	July 2012

4.4.3 Responsibilities

Because of the company's small size, it was not possible for ABC Inc. to designate a full-time or even a part-time risk manager. Management of risk on the project level had to be assigned to project managers. Project managers were designated to carry out the project management activities, communicate risk management-related information to stakeholders and company management, assign those responsible for implementation of

risk responses, and so forth. Along with the responsibility for risk management, project managers were given the authority to determine the level of risk management to be conducted, the risk management activities to be carried out, and the risk management documents to be created in a given project.

During the implementation phase, I planned to serve in a consultant role, answering questions and providing feedback to project managers, when requested.

After completion of the study, auditing risk management-related activities would fall within the responsibility of the company's quality manager, or a specially designated auditor; and audits would be conducted as needed according to the requirements of the ISO quality management system.

4.4.4 Preparation of Training Documents

Documents developed for the risk management training included three PowerPoint presentations, a set of risk management templates, and files for a sample project scenario.

The first of the three presentations gave an overview of risk management and included the following information: definitions of risk and risk management; discussion of the risk management role within the company; goals and objectives of the risk management implementation within the company; and discussion of risk management methodologies and tools. PMI's risk management framework was also discussed in detail. The information contained in this presentation drew heavily from the theoretical framework presented in the first and second chapters of this dissertation.

The second presentation introduced the model of risk sources in translation projects. This model is described in detail in the third chapter of this dissertation on pages 82-122.

The final presentation outlined the risk management implementation plan as well as an implementation timeline. It also provided an overview of the risk management templates created for use at ABC Inc., as well as information for project managers on when and how they should use each template. These templates and guidelines for their usage are provided in Table 4.2 below.

Table 4.2. Guidelines for usage of risk management templates

Document Name	Recommended Usage
Risk Management Plan	Use in all projects with budgets of $5,000-$50,000 with more than five languages, and in projects with budgets of more than $50,000. Use in other projects at stakeholder request.
Risk Register	Use in all projects.
Risk Status Report	Use in all projects with budgets of $5,000 or more. In smaller projects use at stakeholder request.
RBS	Use as a reference (during the risk identification process, i.e., whenever risk identification is performed.)

These guidelines were determined in consultation with the project managers and were scheduled to be reviewed upon completion of this study in September of 2012 per the original implementation plan. In addition, project managers were not required to complete every available risk management document, but instead to use their judgment when and if to create a document, to ensure that the case study did not affect project managers' decisions made with respect to risk management in the projects they managed.

4.4.5 Pre-implementation Procedures and Measurements

After the training materials were prepared, the next step was to carry out pre-implementation measurements. These measurements and assessments included the following:

1. Documenting projected project profit margin
2. Calculating the actual project profit margins of projects closed three months prior to risk management implementation
3. On-time delivery of projects closed three months prior to risk management implementation
4. Assessment of risk management maturity level prior to risk management implementation

4.4.5.1 Projected Profit Margin

Like any other company, ABC Inc. has a specific gross project profit margin goal that it must meet in order to cover its overhead and maintain its profitability. This desired gross profit margin is set by the company management and was 50% at the time of this writing.

4.4.5.2 Actual Profit Margins Prior to Implementation

ABC Inc. calculates gross project profit margins using the following formula:

$$\text{Gross Project Profit Margin} = \frac{\text{Gross Project Profit}}{\text{Total Project Revenue}}$$

Profit margin is tracked on a monthly basis and is reported by the company management during the bi-annual management review, as outlined in the company's ISO

quality management system. This tracking is required of the company to maintain its ISO certification. Reports are generated by running a query in the company management system. This system consists of a software platform with functionality enabling the capture of quote- and project-related information, as well as functionality to record accounting (invoicing) activities; carry out financial reporting; and manage project workflow. The reports generated by the system can be displayed visually on the system dashboard or exported in an Excel spreadsheet (in CSV format). For the purpose of this case study, a report needed to be generated to document the gross project profit margins for the three months preceding the commencement of risk management implementation.

4.4.5.3 On-time Delivery Prior to Risk Management Implementation

To determine the on-time delivery rate for projects completed within the three months prior to risk management implementation, a report had to be generated using the company management system.

4.4.5.4 Risk Management Maturity Level Assessment Prior to Implementation

Risk Management Maturity Model Software (Hopkinson 2011) developed by HVR Consulting Services was used to determine the current level of risk management maturity at ABC Inc. Version 6.0.0 of the software was used. This was the latest version available when the book was published (2011). According to the author, 250 assessments had been carried out using the software at the time of the writing of the book on projects whose

combined value was £60 billion. The risk management maturity level assessment consisted of fifty questions that focus on six areas, or perspectives:

- Stakeholders (their role in the risk management process)
- Risk identification
- Risk analysis
- Risk responses
- Project management (the extent to which risk management is aligned with project management)
- Risk management culture in the organization

The overall risk management maturity level is determined by the weakest area: according to Hopkinson, each perspective is critical to the overall process of risk management and therefore the overall process capability can only be as good as the level of its weakest perspective (2011, 8). Four levels of project risk management capability can be identified using the software: naïve, novice, normalized and natural. A detailed description of these levels is provided in the first chapter of this dissertation.

The software was installed on my laptop for this study. Access to the assessment software was enabled using a WebEx meeting scheduled in advance for each of the project managers undergoing the assessment. During the assessment project managers would have to answer the 50 questions and record their responses directly in the software, as well as in a Word document as a backup (a risk management strategy, in case of technical problems with the software itself or with the WebEx session during the

assessment). The Word documents would then be submitted by email to the researcher upon completion of the assessment.

4.4.6 Training

The next step in the study was to conduct the risk management training. The method of training delivery was remote as well, via a WebEx meeting and a teleconference. The duration of each scheduled session was approximately two hours. After completion of the training, a sample project scenario was prepared for the project managers. The purpose of the sample project scenario was to plan risk management activities, to identify potential risks and to carry out qualitative analysis in order to plan risk responses. Unlike in a real project, no monitoring and controlling process could be carried out as part of this sample scenario because the sample project could not be executed.

4.4.7 Risk Management Program Implementation

After completion of the training and the sample project scenario, a period of three months was scheduled to allow project managers to apply what they had learned during the training. The duration of the implementation period (three months) was determined by trying to balance two imperatives. On one hand, it was essential to give each project manager the opportunity to manage to completion one or more projects in which risk management was implemented. On the other hand, it was important to maintain a reasonable timeline for this study. During the implementation period, project managers would be instructed to carry out risk management activities on projects and to use the risk

management templates provided to them according to the guidelines discussed during the training.

After the training, consulting and guidance would be made available to the project managers by phone and email throughout the implementation period. ABC Inc's project managers would be encouraged to email their in-progress risk documentation for review and to ask specific questions about anything in the risk management documentation or about risk management in their projects.

4.4.8 Post-implementation Procedures and Measurements

At the end of the implementation period, post-implementation measurements were scheduled:

1. Calculation of the actual project profit margins of projects closed in the three months following the risk management implementation
2. On-time delivery of projects closed in the three months following the risk management implementation
3. Assessment of risk management maturity level after risk management implementation
4. Structured interviews
5. Collection of project documentation

4.4.8.1 Actual Profit Margins after Risk Management Implementation

A report had to be run in the company management system to document the gross profit margins for the three months following the implementation of risk management.

4.4.8.2 On-time Delivery after Risk Management Implementation

To determine the on-time delivery rate for projects completed in the three months that followed risk management implementation, a report had to be generated using the company management system.

4.4.8.3 Risk Management Maturity Level Assessment

Assessment of the project managers' risk management maturity level was scheduled to be carried out using Risk Management Maturity Model software at the end of the three-month implementation period. The method of assessment was the same as that used in the baseline assessment: project managers would access the software via a WebEx session and complete the assessment questionnaire, and they would also capture their responses in a Word document as a backup. The Word documents would then be emailed to the researcher upon completion.

4.4.8.4 Project Documentation

After the interviews, risk management documentation had to be collected for projects discussed during the structured interviews with the project managers. The purpose of collecting this documentation was to gather information on risks identified and risk management activities conducted during the project to prepare reports for later analysis in the case study. Collection would be done by email.

4.4.8.5 Structured Interviews

Structured interviews were planned with the project managers to collect additional information about projects in which risk management was carried out and to solicit feedback about the training and risk management program implementation. Interviews were to be conducted over the phone. Interviews would be recorded using the built-in recording capability of the VoIP phone system used by ABC Inc. Recorded interviews could then be downloaded as audio files and transcribed by the researcher in Microsoft Word.

4.5 Materials

The following materials were used in this study:

1. Company management system (see section *4.4.5.2* above for description)
2. Training documentation (see section *4.4.4* above for description)
    a. Three Microsoft PowerPoint presentations for risk management training
    b. Sample project scenario
        i. Source materials for translation
        ii. General project description
    c. Risk management process flowchart
    d. Risk management templates
        i. Project risk management plan
        ii. Risk register
        iii. Risk status report

iv. RBS document (see *Appendix B*)

e. Company's lessons learned template

3. Risk Management Maturity Model software (Hopkinson 2011)
4. Structured interview protocols for post-implementation interviews (see *Appendix A*)

4.6 Conducting Case Study

The planned case study research involved human subjects; therefore approval had to be obtained from the Institutional Review Board (IRB) at Kent State University prior to carrying out the research. After completing the methodology design, and creating the training materials and instruments, documents were prepared for IRB review. Required documentation included the following: IRB application form for using human subjects in research; structured interview protocol; informed consent forms for participants; completion form for the training course on human research; audio/visual consent form; and signed investigator assurance. All documentation was submitted to the Kent State University IRB on December 7, 2011. Approval was received from the IRB on January 25, 2012 (see *Appendix D*).

After receiving approval from the IRB, training dates and pre-implementation data collection with the ABC Inc were finalized. The original schedule had to be revised, as I was on maternity leave through end of February of 2012 and it was also necessary to accommodate the project managers' availability at ABC Inc. The actual case study timeline is presented in Table 4.3 below.

Table 4.3. Revised implementation timeline

Step	Planned Schedule	Actual Schedule
Training	March 2012	March 27-April 25, 2012
Selection of appropriate projects	Ongoing, starting April 1, 2012	Ongoing, starting May 1, 2012
Application of RM processes and RM templates/guidelines in the selected projects	Starting April 1, 2012	Starting May 1, 2012
Interviews	July 2012	October 2012[8]

The case study proceeded according to plan (as described in the *Design* section of this chapter) with a few exceptions, one of which being the amended schedule mentioned above; the other will be discussed shortly.

Pre-implementation measures were carried out before the risk management training was conducted:

- The projected project profit margin was documented.
- A report was generated containing the actual project profit margins of projects closed three months prior to implementation. This report covered the first quarter of 2012 (January, February and March).
- A report on on-time delivery of projects closed in the three months prior to implementation, however, could not be generated. ABC Inc. adopted a new management system in the beginning of 2011. The old system allowed generation of on-time project delivery reports, but the new system did not have this functionality. It

[8] With the exception of two participants: one who left the company in June, and therefore was interviewed in June, and another, who started at ABC Inc. in June. The new employee was interviewed in December, after she had completed managing two projects start to finish.

is unknown at the time of this writing whether this capability will be included in future versions of the system.

- A pre-implementation assessment of project risk management maturity level was conducted with four participants via WebEx on March 6-8. As the fifth participant joined the company only in June, the pre-implementation assessment with that participant was conducted in June, concurrently with the employee's general training.

Training of the project management staff was conducted on March 27, April 3 and April 25, 2012. Due to some technical difficulties accessing WebEx meetings via Internet Explorer 9 on Windows 7 64-bit OS, the second and third sessions of the training had to be rescheduled several times, which resulted in a month-long gap between the first and the last (third) session. The problem was solved when participants used a 32-bit version of Internet Explorer to access the WebEx meetings.

During the course of the training, participants requested that an abbreviated and modified version of the training targeted at sales staff be prepared and delivered to ensure risk management buy-in across the company. A modified sales-focused risk management training session of one and a half hours' duration was carried out on May 15, 2012. The goal of this sales-focused training was to increase awareness of risk management on the sales side the company. No assessments or procedures were carried out with the sales staff, because they were outside of scope in the original research plan. The risk management training for the new employee who joined ABC Inc. in June was carried out on June 26, 2012 and June 28, 2012.

After completing the training, the project managers were given three months to apply what they had learned during the training before post-implementation measures and assessments were scheduled to be taken. I was available for consultation throughout this period by phone and email. One of the project managers did contact me with questions, and asked for feedback on a risk register for one of the projects. However, I did not directly participate in project risk identification or any other risk management processes.

Post-implementation measurements and assessment could not be carried out immediately following the end of the three-month period, as several project managers had scheduled vacations at that time and some had not yet completed projects in which they were managing risks. Consequently, post-implementation assessments and interviews of three of the project managers were carried out between October 2 and November 1, 2012. The structured interview and assessment of the participant who left the company during the study were conducted during the last week of June, 2012. The structured interview and assessment of the participant, who joined the company in June, 2012 were conducted on December 19, 2012 because that employee was on a long-term off-site assignment and did not complete any projects in which she managed risk until December.

Post-implementation assessments were conducted using the same method as for the pre-implementation assessments. Interviews were conducted by teleconference, using the company VoIP phone system. This VoIP system's capability was used to record interviews, which were later downloaded as audio files and transcribed by the researcher

in Microsoft Word. A slightly different procedure had to be followed during the interview of the last participant. Because of a scheduling conflict, the VoIP conference line could not be used for this interview. Consequently, this final interview was conducted via Skype and recorded using a stand-alone digital recorder. This final interview was subsequently transcribed in Microsoft Word as well.

A report on project profit margins for the third quarter of 2012 (July, August and September) was generated on October 26, 2012. As mentioned earlier, a report on on-time delivery could not be generated, because the new management system adopted by the company does not have that capability.

After completion of interviews, risk management documents were collected from the project managers for the projects discussed during the interviews. Project managers submitted completed risk registers and other documents, when such were available (for example, project risk management plans, risk status reports, and lessons learned documents). The method of collection was email, as planned.

After the data gathering stage was completed, documentation of the results and analysis were initiated.

CHAPTER 5. RESULTS

This research focused on developing and testing an approach to risk management that could be successfully applied in translation and localization projects in the language industry. This chapter presents the results of the case study that was carried out in a small translation company, which is representative of a typical translation company. The case study included training of the company's project managers in applying a standard risk management framework and using a model of risk sources customized for translation projects they were currently working on. The objectives set for the implementation of the risk management in the company were: (a) to contribute to the development of more mature project management processes within the company; (b) use information about risks and the management of them to facilitate on-the-job training of new hires in the production department; (c) to use risk and risk management information to raise awareness of issues in translation/localization projects among customers; and (d) to provide information on which to base company-wide business decisions. The length of the case study, from receiving approval from the IRB at KSU to completing data collection, was approximately one year. During this case study, both qualitative and quantitative data were collected.

Qualitative data included structured interviews with the project managers after completion of the program implementation, as well as project risk documentation that the

project managers created during the projects where they managed risks systematically. The results of the analysis of the qualitative data are presented as project reports in the first part of this chapter (one report for each project discussed during the interviews), and summaries of the two sections of the interviews that focused on feedback on the risk management training that was conducted and project risk management approach.

Quantitative data included project profit margins (projected and actual before and after risk management implementation), assessments of risk management maturity levels (before and after risk management implementation) and the number of risk events that occurred in the projects discussed in the structured interviews.

5.1 Qualitative Findings

5.1.1 Case Descriptions

Information gathered during the interviews and collected from project documentation was used to create case descriptions of several projects. A portion of the structured interview contained questions that focused on gauging the effectiveness of the original risk management training. The purpose of the questions about the effectiveness of the training was to find out whether the training contained any gaps that had to be bridged in order to improve the training effectiveness and ensure that project managers undergoing the training were better prepared to carry out systematic risk management. Some of the risk descriptions in the project reports that follow have been slightly revised to minimize the use of internal jargon and improve readability, as many of the risks were written down in

short-hand. The meaning of the risk descriptions was not changed. Also, the pronouns *she*, *her* and *hers* will be used throughout regardless of the gender of the participants for consistency and to ensure that a specific participant cannot be identified by gender, since the participant pool is so small.

5.1.1.1 Project Report 1

Project Description

The goals of the project were (1) to optimize a training manual, originally written in English and to create an internationalized English version of that manual; as well as (2) to localize the optimized version into three languages (Spanish, Russian and Japanese). Source files were provided as MadCap Flare project files. Project services included machine translation, post-editing, human translation, localization engineering setup (internationalization) and integration in MadCap Flare, and quality control. Project duration was estimated at 60 business days.

Risk Management Planning

The project manager did not create a project risk management plan for this project.

Risk Identification

The project manager set up a risk register for this project. During the initial risk identification process a total of six risks were identified. The sources of the identified risks were technology and the post-editing process. Identified risks, listed in Table 5.1

below, were documented in the risk register together with their descriptions and descriptions of the potential impacts.

Table 5.1. Risks identified for project 1 during initial risk identification

Risk ID	Risk Description	Risk Source	Risk Category	Priority	Strategy	Date of Risk
1	Flare tags may not be processed correctly during machine translation (MT) process	Techno-logy	Technical	Low	Mitigate	9/7/12
2	New page break strategy in Flare may not work for all sections in the manual	Techno-logy	Technical	Low	Accept	8/9/12
3	Japanese MT engine has new, limited data	Techno-logy	Technical	High	Mitigate	9/7/12
4	MT post-editors are unfamiliar with the MT process specific to the customer[9] => terminological inconsistencies; delays	Task Editing	Transla-tion	Medium	Mitigate	Did not occur
5-6	MT post-editors are unfamiliar with the MT process specific to the customer	Task Editing	Transla-tion	Low	Transfer/ Mitigate	9/30/12

[9] The same risk was identified as having three distinct impacts and therefore was documented by the project manager under three different IDs.

Risk Analysis and Response Planning

The project manager carried out an analysis of each risk and determined a priority rating for each. These priority ratings were recorded in the risk register. The project manager also developed strategies for responding to all of the identified risks and provided descriptions of those strategies in the risk register.

Risk Monitoring and Control

The project manager monitored the project for risk triggers.[10] She implemented responses as risk events occurred, tracked risk status in the risk register, and documented actual risk impacts on the project (when they were different from the forecasted impacts).

Throughout the project, the project manager documented in the risk register additional risk events that were not identified during the initial risk identification stage. Some of these risks arose unexpectedly, such as risks #9, 10, 11, 12; while others, such as risks #7, 8, 13 were identified throughout the project, but before they occurred. The risks are presented in Table 5.2 below.

[10] According to PMI, triggers are "indications that a risk has occurred or is about to occur" (2008, 452).

Table 5.2. Additional risk events that occurred during project 1

Risk ID	Risk Description	Risk Source	Risk Category	Priority	Strategy	Date of Risk
7-8	Inconsistencies in the Japanese translation of the manual due to the use of two different post-editors	Task Editing	Translation process	Medium	Mitigate	9/24/12 10/10/12
9	Preparation of the files for translation using the new page break strategy took longer than expected	Task Localiza-tion	Localiza-tion process	Medium	Mitigate	9/7/12
10	One of the Japanese post-editors did not have the required translation tool	Task Editing	Translation process, technical	Medium	Accept	9/7/12
11	New Japanese editor not skilled in the use of the required translation tool and did not meet deadlines.	External	Translation process	Medium	Mitigate	9/24/12
12	The function of exporting for review from the required translation tool did not work	Techno-logy	Technical	High	Accept	9/24/12
13	Unplanned overtime required of PM and localization engineer	Project Manage-ment	Planning	High	Mitigate	9/24/12

Another potential risk was mentioned during the interview, namely the use of the same Spanish deliverable in multiple Spanish-speaking locales despite the fact that terminology can vary significantly across different Spanish locales in this domain. The source of risk is use of the final output. The actual impact on the project is still unknown, since this risk has not materialized at the time of this writing. This risk was not yet documented in the risk register when the interview took place.

A total of ten risk events occurred in this project, of which six were identified and planned for in advance. Four unexpected risk events occurred, and two identified risks did not occur.

Closing Remarks

According to the project manager, the main impacts of the risks that materialized during the project were schedule delays, shifts in internal deadlines, and additional cost due to overtime, e.g., the overhead cost of the project manager's and localization engineer's overtime. Despite the described impacts, the project manager considered the project a success because the client received the desired output, the client's internal deadlines were not negatively affected despite the localization schedule delays, and the client's source files were optimized to facilitate future updates to the manual. The project manager believed that the customer also considered the project a success for the same reasons.

While the project manager acknowledged having a higher awareness of risks in this project compared to projects in which she did not systematically manage risks, she

admitted to not having done an effective job of planning responses for the identified risks, which undermined the effectiveness of risk management in this particular project:

> But I didn't do an effective job of coming up with responses to the risks that I identified. So it could've been more effective. And in the end, since the responses were not effective, it probably wasn't much different than project for which I did not do formal risk management (Participant 2).

5.1.1.2 Project Report 2

Project Description

The goal of this project was to translate a technical manual for a piece of industrial machinery into French for France. Source files were provided as Microsoft Word documents. Project services included translation using a CAT tool, editing, desktop publishing, and proofreading. The project duration was initially estimated at 34-45 business days, depending on the number of translation team members that would ultimately be involved. In consultation with the client the final estimate of 45 business days was set in order to allow the use of a smaller translation team.

Risk Management Planning

The project manager did not create a project risk management plan for this project.

Risk Identification

The project manager created a risk register for this project. During the initial risk identification process, a total of five risks were identified. All of the identified risks, listed in Table 5.3 below, were documented in the risk register along with their

descriptions and potential impacts. Risks #2 and #3 were identified during the initial round of risk identification but did not occur and were retired.

Table 5.3. Risks identified for project 2 during initial risk identification

Risk ID	Risk Description	Risk Source	Risk Category	Priority	Strategy	Date of Risk
1	Translator might become unavailable due to events beyond his or her control during the project (project is of long duration)	External	Resources	High	Mitigate	7/12/12
2	Translators might lose motivation or productivity might suffer due to the project's long duration	Task Transla-tion	Resources	Medium	Share	Did not occur
3	Lack of qualified translators who use the required CAT tool	Project Manage-ment	Resources	Low	Accept	Did not occur
4	Incomplete source materials	External	Input	Medium	Avoid	5/16/12
5	The software interface had been translated several years earlier, but the status of its previous translation is unknown	Organiza-tion	Input	Low	Mitigate	7/18/12

Risk Analysis and Response Planning

The project manager carried out the analysis of each risk and determined a priority rating for each. These priority ratings were recorded in the risk register. The project manager

also developed strategies for responding to all of the identified risks and provided descriptions of those strategies in the risk register.

Risk Monitoring and Control

The project manager monitored the project for risk triggers. She implemented responses as the risk events occurred, identified new risks, tracked risk status in the risk register, and documented actual risk impacts on the project (when they were different from the forecasted impacts). Risk event #7 grew out of risk #5, which had been identified during the project planning process. Additional risks identified during the project were risk #7, which occurred and risk #8, which did not.

Table 5.4. Additional risk events that occurred or were identified in the course of project 2

Risk ID	Risk Description	Risk Source	Risk Category	Priority	Strategy	Date of Risk
6	The client was planning a software update and an update to the manual	External	Input	Low	Share	8/1/12
7	Disagreement between translators on how to handle user interface references in translation	Task Editing	Input	Medium	Avoid	12/19/12
8	Project delay beyond current calendar year can lead to billing issues	External	Customer	Medium	Avoid	Did not occur

One of the risks that the participant mentioned during the interview was not documented in the risk register. This risk is associated with the final output: since the customer was unsure whether the end users used the original (English) or localized (French) version of the software, there was a risk that the strategy chosen for handling references to the UI in the documentation might not be acceptable to end users.

Closing Remarks

According to the project manager, the main impact of the risks that materialized during the project was a schedule delay. However, this delay led to several opportunities, including the opportunity to use one instead of multiple translators, resulting in a more stylistically consistent translation. The project manager considered this project a success, because despite the challenges, changes and the delays in the project, the final output was of high quality. The project manager believed that the customer also thought the project to be successful, since ABC Inc. accommodated changes in the schedule and the source files effectively and delivered high quality work.

The project manager acknowledged that she was managing risks more actively and therefore was able to respond to them more effectively:

> I think with this one I did a better job of identifying the strategies for managing the risks and so when a risk actually occurred, I was definitely better able to deal with that and was more prepared for it (Participant 2).

5.1.1.3 Project Report 3

Project Description

The goal of the project was to produce a Russian version of an operating manual for a piece of large industrial equipment. Source materials were provided as Adobe FrameMaker files. Project services included preparation of FrameMaker files for translation, localization of images, translation, editing, desktop publishing and proofreading. Project duration was estimated at 37 business days.

Risk Management Planning

The project manager created a project risk management plan for this project, even though this project had a budget of less than $50,000 and involved translation only into one language.

Risk Identification

The project manager set up a risk register for this project. During the initial risk identification process a total of five risks were identified. Identified risks, listed in Table 5.5, were documented in the risk register together with their descriptions and descriptions of the potential impacts.

Table 5.5. Risks identified for project 3 during initial risk identification

Risk ID	Risk Description	Risk Source	Risk Category	Priority	Strategy	Date of Risk
1	Unreliable TM (with potential false 100% matches)	Project Manage-ment	Technical/ quality	High	Mitigate	N/a
2	Team's familiarity with client's materials may lead to ignoring of instructions specific to this project	Project Manage-ment	Technical/ quality	Medium	Mitigate	N/a
3	Previous translation of name plates, used to identify equipment, is not available	External	Customer/ customer misunder-standing of needs, scope, schedule, quality require-ments	Medium	Share	N/a
4	Team members have no previous experience with the required CAT tool.	Techno-logy	Translator tool knowledge	Medium	Mitigate	N/a
5	No previous experience using required CAT tool on FrameMaker files for this customer	Techno-logy	Techno-logical change/per-formance and reliability	Medium	Mitigate	N/a

Risk Analysis and Response Planning

The project manager carried out an analysis of each risk and determined a priority rating for each. These priority ratings were recorded in the risk register and the project risk management plan in the form of a completed Probability-Impact Matrix. The project manager also developed strategies for responding to all of the identified risks and provided descriptions of those strategies in the risk register.

Risk Monitoring and Control

The project manager monitored the project for risk triggers. She implemented responses as the risk events occurred and tracked risk status in the risk register. However, she did not specify the date when the risks occurred. One of the risks (risk #1) was resolved before the start of translation and thus was completely avoided. One other risk, risk #5, occurred after delivery of the translation to the customer. As a result of this risk event, one issue had to be corrected (the color of two callout lines had to be changed) and the final output had to be redelivered.

Closing Remarks

According to the project manager, the main impact of the risk that materialized during the project was the need to redeliver the finalized files. Since the correction was minor (only the color of two callout lines had to be corrected in a 400-page manual), the schedule was not significantly affected and both the project manager and the customer still considered the project a success.

The project manager acknowledged that focusing on risk management in this project ensured that she was more prepared for the project, for example by running more tests on the required CAT tool, which was used for the first time in a project of this type:

> Say, you know, this is definitely a risk [using the required translation software on Adobe FrameMaker files for the first time] and I was going through and rated it as a high-priority risk, you know, for the priority and probability as well, so for me it was a big one. So I would say it pushed me more for testing it to make sure there would not be any problems. In the past, would I have tested it? Maybe, but this definitely pushed me to actually do it to make sure it got done (Participant 1).

5.1.1.4 Project Report 4

Project Description

The goal of the project was to produce Danish versions of two software guides and software release notes. Source files were provided as MadCap Flare project files and one Microsoft Word document containing software release notes. Project services included preparation of the MadCap Flare files for translation, terminology development, translation, editing, integration into MadCap Flare, desktop publishing in Microsoft Word, quality check, and proofreading. Project duration was estimated at 20 weeks.

Risk Management Planning

The project manager created a project risk management plan for this project, as the budget for this project was over $50,000. According to the established guidelines, a risk management plan must be created for any projects with budget larger than $50,000.

Risk Identification

The project manager set up a risk register for this project. During the initial risk identification process a total of seven risks were identified. Identified risks, listed in Table 5.6 below, were documented in the risk register together with their descriptions and descriptions of the potential impacts.

Table 5.6. Risks identified for project 4 during initial risk identification

Risk ID	Risk Description	Risk Source	Risk Category	Priority	Strategy	Date of Risk
1	Confusion, lost/missing files or deadlines due to translators' lack of familiarity with the company management system and file hand-off processes	Techno-logy	Training	Medium	Mitigate	N/a
2	Late deliveries or bottlenecks due to the unproven reliability of new translators	External	Subcont-ractors and suppliers reliability	Medium	Accept	N/a
3	Translation inconsistencies due to the large size of the translation teams and the use of multiple editors	Task Transla-tion	End-user response	High	Mitigate	N/a
4	As a result of the amount of instructions (non-translatables, handling specific words, etc.), client's requirements might not be met	Organi-zation	Material	Medium	Mitigate	N/a
5	Above-average daily throughput expectations resulting in an aggressive timeline	Project Manage ment	Control-ling time/ schedule	Medium	Mitigate	N/a

Risk ID	Risk Description	Risk Source	Risk Category	Priority	Strategy	Date of Risk
6	Inconsistencies and errors introduced during client review of terminology	Task Termino-logy Develop ment	Process=> Review knowledge =>Transla -tion/ termino-logy experience	High	Mitigate	N/a
7	Loss of potential business from current customer, if expectations are not met and communication is lacking during the project. Opportunity to be introduced to the customer's parent company can be lost.	Project Manage-ment	Communi-cation	Medium	Avoid	Did not occur

Risk Analysis and Response Planning

The project manager carried out an analysis of each risk and determined a priority rating for each. These priority ratings were recorded in the risk register and the project risk management plan. The project manager also developed strategies for responding to all of the identified risks and provided descriptions of those strategies in the risk register.

Risk Monitoring and Control

The project manager monitored the project for risk triggers. She implemented responses as the risk events occurred and tracked risk status in the risk register. During the

interview, the project manager mentioned two additional unexpected risk events that occurred during the project, but which were not documented in the risk register:

- The client supplied an incorrect version of the source files for translation
- The client used multiple reviewers, who disagreed with each other on terminology during the terminology review

In addition, the lessons learned document completed by the project manager at project completion contained information about other risk events that materialized during the project, but which were not identified as such in risk documents or in the lessons learned document. These risk events primarily had an impact on the project profit margin and included the following:

- Scope changes in the form of customer requests for additional services and support.
- Unanticipated localization challenges that contributed to localization effort overrun.
- An additional round of proofing was required to ensure consistency between components completed by different sub-teams.
- Non-typical errors in formatting of output from CAT tool required additional QC changes.
- QC person misunderstood instructions, causing additional work for the PM.
- Problems with client-supplied materials (source project files and localized screens).

A total of 14 risk events materialized during the project. Six of these events (or 43% of all risk events) were identified in advance and were planned for, while eight events were unexpected. One of the risks identified initially did not occur.

Closing Remarks

According to the project manager, the main impacts of the risks that materialized during the project were the expansion of the translation team and longer terminology review due to the use of multiple client reviewers. Despite the impacts, the project manager considered the project a success because in the end the project was completed without impacting the customer's internal deadlines and the quality was what the client expected: "when the client wrote back . . . they were absolutely thrilled with our work. Yeah, this was definitely a successful project" (Participant 1). However, while the project manager considered the project a success, the profit margin was eroded due to multiple cost overruns that were absorbed internally.

In addition, the project manager remarked that this project helped her improve her communication skills, since she had to work with such a large team; in her words the project team ultimately developed into "a well-functioning engine."

5.1.1.5 Project Report 5

Project Description

The goals of the project were to produce German and French versions of a software user manual. Source files were provided as Microsoft Word documents. Project services included translation, editing, desktop publishing and proofreading. Project duration was estimated at 15 business days. This project was a part of an ongoing cycle of translation and updates of software and user documentation for an existing customer.

Risk Management Planning

The project manager chose not to create a project risk management plan for this project.

Risk Identification

The project manager set up a risk register for this project. During the initial risk identification process a total of two risks were identified. The sources or these risks were determined as external and localization process. The project manager did not define sources of risk at a more granular level. Identified risks, listed in Table 5.7 below, were documented in the risk register together with their descriptions and descriptions of the potential impacts:

Table 5.7. Risks identified for project 5 during initial risk identification

Risk ID	Risk Description	Risk Source	Risk Category	Priority	Strategy	Date of Risk
1	Customer might decide to update the source files after translation of the source file has already started	External	Not provided	Medium	Share	8/2/12
2	Localization schedule overruns	Task L10n	Not provided	High	Mitigate	7/25/12

Risk Analysis and Response Planning

The project manager carried out an analysis of each risk and determined a priority rating for each. These priority ratings were recorded in the risk register. The project manager also developed strategies for responding to all of the identified risks and provided descriptions of those strategies in the risk register.

Risk Monitoring and Control

The project manager monitored the project for risk triggers. Since both risk events occurred in the project, planned risk responses were implemented when the risk events occurred. The project manager tracked risk status in the risk register and documented actual risk impacts on the project.

Closing Remarks

According to the project manager, the main impacts of the risks that materialized during the project were a schedule delay and a budget increase. However, since the delay was driven by the updates requested by the customer, the customer expected that ABC Inc. would revise the schedule and the budget accordingly. Both the customer and the project manager considered the project a success, since the customer's expectations were met and there was no negative impact on the profitability of the project or delivery dates.

5.1.1.6 Project Report 6

Project Description

The goal of the project was to produce French-Canadian versions of two technical manuals. Source files were provided as Adobe InDesign documents. Project services included translation, editing, desktop publishing and proofreading. Project duration was estimated at 15 business days. The project is a part of ongoing translation/updates of technical manuals for an existing customer.

Risk Management Planning

The project manager did not to create a project risk management plan for this project, since the project budget was less than $50,000 and the project included translation into only one language.

Risk Identification

The project manager set up a risk register for this project. During the initial risk identification process only one risk was identified. The source was determined as the desktop publishing process. The source of risk was not defined at a more granular level. The identified risk, documented together with its description and description of the potential impact, was as follows: missing text from images due to the text being typed up manually, instead of extracting text automatically using special stand-alone software or built-in or add-on filters.

Risk Analysis and Response Planning

The project manager chose to mitigate the identified risk by introducing an inspection step after text extraction. Mitigation in this case reduced the likelihood of the risk event (missing text) occurring during the project.

Risk Monitoring and Control

The project manager monitored project for triggers of the identified risk and any other potential risks she did not identify. During the interview, the project manager mentioned that a second risk event occurred during the project. This risk was not recorded in the risk

register. The risk event was the inconsistent treatment of the acronyms and corresponding full forms of these acronyms in the translation (risk source: translation process/project-specific processes). The translator pointed out that leaving the acronyms in English and translating the full forms would create inconsistency. This issue was resolved with the customer and the potential impact on the project was avoided (e.g., the customer might not have agreed with the strategy that the translator chose, or the translator might have disagreed with the customer's requirements and ignored them).

Closing Remarks

The two risk events that occurred in the project did not have an impact on either the project budget or schedule. However, the project manager would have liked to have anticipated the second risk event that occurred during the project, but was not identified or resolved in advance of the commencement of translation. In the project manager's opinion, the solution requested by the customer negatively impacted the quality of the final translation, even though the customer did not express any concerns about quality:

> I don't know if that's an actual lesson I learned from the risk, but I would say that the client sometimes just doesn't care about the quality. They just want to have things translated. And that definitely impacts me as a project manager (Participant 3).

5.1.1.7 Project Report 7

Project Description

The goal of the project was to produce a Burmese version of packaging instructions and a training form. Source files were provided as Microsoft Word documents. Project services included translation, editing and proofreading. Project duration was estimated at 7 business days.

Risk Management Planning

The project manager did not create a project risk management plan for this project.

Risk Identification

The project manager set up a risk register for this project. During the initial risk identification process a total of three risks were identified. Identified risks, listed in Table 5.8, were documented in the risk register together with their descriptions and descriptions of the potential impacts. The sources of these risks were identified as external and technology.

Table 5.8. Risks identified for project 7 during initial risk identification

Risk ID	Risk Description	Risk Source	Risk Category	Priority	Strategy	Date of Risk
1	New, unqualified translators into Burmese, which could lead to substandard translation and/or schedule delays	External	Vendor availabi-lity/quail-fication	Medium	Avoid	10/30/12
2	Potential for incorrect handling of brand names and trademarks due to lack of specifications provided by the customer	External	Scope	Low	Avoid	Did not occur
3	Burmese characters might not display correctly in the customer's version of Microsoft Word	Techno-logy		High	Avoid	Did not occur

Risk Analysis and Response Planning

The project manager carried out an analysis of each risk and determined a priority rating for each. These priority ratings were recorded in the risk register. The project manager also developed strategies for responding to all of the identified risks and provided descriptions of those strategies in the risk register.

Risk Monitoring and Control

The project manager monitored the project for risk triggers. All three risks identified during the identification stage were avoided using the planned responses. However, two risk events that were not anticipated occurred during the project. These risk events are detailed in Table 5.9 below.

Table 5.9. Risks events that occurred during project 7

Risk ID	Risk Description	Risk Source	Risk Category	Date of Risk
1	File path was automatically updated in one of the documents and reflected internal server file structure, rather than the customer's	Project Management	Scope	11/2/12
2	The customer requested an additional service, translation certification, which was outside of the original project scope	External	Client	11/5/12

Closing Remarks

Three risks identified by the project manager were avoided and therefore had no impact on the project. One of the two risk events that manifested itself during the project had a

minimal impact on the project cost, which was the cost of certification absorbed by ABC Inc. rather than being charged to the customer. In addition, provision of certified translation was added as a standard requirement to all future projects for this customer, unless the customer specifies otherwise. Another lesson that the project manager learned in this project is the need to pre-qualify translators into languages that are rarely requested by customers to ensure that there is a pool of translators to draw from should translation into such languages be requested.

5.1.1.8 Project Report 8

Project Description

The goal of this project was to produce a French-Canadian version of a software help system (upgrade of a previously localized help system). Source files were provided as RoboHelp project files. Project services included translation, editing, localization engineering and quality check. Project duration was estimated at 24 business days.

Risk Management Planning

The project manager did not to create a project risk management plan for this project.

Risk Identification

The project manager set up a risk register for this project. During the initial risk identification process a total of five risks were identified. The sources were determined as external, organizational, editing process, localization process, and project management.

Identified risks, listed in Table 5.10 below, were documented in the risk register together with their descriptions and descriptions of the potential impacts.

Table 5.10. Risks identified for project 8 during initial risk identification

Risk ID	Risk Description	Risk Source	Risk Category	Priority	Strategy	Date of Risk
1	Using a translator who is new to the customer's project	External	Alterna-tive suppliers	Medium	Mitigate	Did not occur
2	New project manager	Organi-zation	Staff changes	Low	Share	10/30/12
3	Exclusion of 100% matches from editing scope	Task Editing	Scope	Medium	Mitigate	N/a
4	Exclusion of unchanged files from project scope	Project Manage-ment	Scope	Medium	Accept	N/a
5	Limited availability of localization manager	Task L10n	Schedu-ling	Medium	Mitigate	N/a

Risk Analysis and Response Planning

The project manager carried out an analysis of each risk and determined a priority rating for each. These priority ratings were recorded in the risk register. The project manager also developed strategies for responding to all of the identified risks and provided descriptions of those strategies in the risk register.

Risk Monitoring and Control

The project manager monitored the project for risk event triggers and tracked risk status in the risk register. All risks were proactively managed; responses were implemented and were effective. During the interview, the project manager mentioned that one risk event

occurred during the project that was not captured in the risk register. This event was inaccessibility of the context to the translation team. However, this risk event was resolved without any negative impact on the project, after corrected access information for viewing context was provided to the translation team.

Closing Remarks

Because all responses were implemented and were effective, no negative impact occurred on the project. The project manager considered the project a success and thought that the customer was satisfied with the final result as well. The project manager noted that there was a difference between this project, in which she managed risks and others, in which she did not:

> *Researcher*: In your opinion, was there any difference between this project, in which you managed the risks systematically, and projects in which risk management processes were not carried out?
>
> *Participant 5*: Yeah, there was. Because, I guess, more risks were written down. What to expect for some of them. Yes, that's it.

5.1.1.9 Project Report 9

Project Description

The goal of the project was to produce versions of various types of software documentation (handbooks, data specifications, and customer site requirements, among others) in eleven languages. Source files were provided as MadCap Flare project files. Project services included translation, editing, localization engineering, desktop publishing

and quality check. Project duration was estimated at 18-25 business days, depending on the language.

This project was already in progress at the time of risk management training completion. Nevertheless, the project manager chose to implement some risk management processes.

Risk Management Planning, Risk Identification, Risk Analysis, Response Planning

Since this project was already in progress at the time risk management training was carried out, these processes could not be carried out by the project manager.

Risk Monitoring and Control

The project manager monitored the project for risk triggers. Several risk events occurred during the project. These risks are provided in Table 5.11 below. Since no risk register has been provided for this project, the risk events were written down based on the discussion with the participant during the interview. Risk sources and categories were not identified by the participant, but entered in the Table 5.11 by researcher.

Table 5.11. Risks events that occurred during project 9

Risk ID	Risk Description	Risk Source	Risk Category
1	Errors in the source content	Input	Text/factual accuracy
2	A new editor exceeded the allocated editing budget in Spanish	Editing process	Editor's knowledge or cognitive processes or approach
3	The Croatian and Norwegian translators delivered their files late	External	Subcontractors/ suppliers reliability

4	Updates to the source materials were sent by the customer during the project	External	Customer/scope

While the project manager did not do risk management planning in advance, she did build contingencies into the project budget and schedule. As a result, the project remained on budget and met the final deadline, but some of the interim delivery milestones were not met.

Closing Remarks

The project manager remarked that if she were to manage this project over again, she would plan more contingency in the schedule, would expand the pool of subcontractors prior to the project launch, would be more stringent with deadlines with vendors, and would set aside a larger contingency budget for updates for this customer in this project and in all future ones. Responding to the question about whether the project was successful or not overall, the project manager stated that it was:

> Yeah, I think so. Um, we delivered on time overall. Like I said, I wish our interim deliveries would have been a little bit more on time, but I think those were due to forces beyond our control. And I had a 45% profit margin, which I think is not bad. And the client was satisfied. There weren't many issues that came up with the vendors overall. There were definitely glitches and stresses, but compared to other projects in the past, this one ran more smoothly than others (Participant 4).

5.1.2 Risk Management Training Feedback

As part of the survey, questions about effectiveness of the training were posed to the participants. All five of the surveyed participants felt like the training prepared them to

carry out risk management when managing translation and localization projects. One of the participants commented that she felt overwhelmed by the amount of information she received. However, this participant had not yet managed a single project at ABC Inc. at the time she underwent the assessment. She also received risk management training during the course of her general company training and advanced project management training when she was hired, unlike the rest of the participants who had already had at least ten months of work experience at ABC Inc. and who had undergone advanced project management training several months in advance of the risk management training.

Two participants mentioned that they sometimes found it a bit challenging to use some of the templates, such as the project risk management plan and the risk register:

> I think maybe just knowing when to fill out certain forms, and with the Excel file [risk register], like I was saying, knowing what exactly everything is [which columns should contain which information about risks]. Because there's a lot to it, you know, and sometimes it can become entangled in your brain. But overall I thought, you know, we know how to fill out this form. And this form helps us, you know, break it down (Participant 4).

> You know, sometimes when I would write something [in the project risk management plan], I'd say, ok, what's the purpose, what's the scope of this one? What's the overall picture, what are we doing? I'll write all that and I'll get to the next question and I say, well, isn't this kind of already answered in the previous one? You know, and… So I would skip it, you know, or I would, say, write something like: refer to the above answer or something like that. I guess, I didn't necessarily know: if hey, am I missing something huge? Or well, maybe this is just too detailed and I've already described it above, where maybe I didn't need to? Other than that, I think this was the only time when I would stop in the process and go: hmm, something, you know, something just wasn't smooth. (Participant 1)

In response to the question about whether participants changed how they manage projects as a result of the training, the project managers gave varied responses. One participant acknowledged that the training changed how she manages larger projects. Two participants felt that the training didn't change how they manage projects per se, but they are documenting more how they think about projects and risks. Another participant similarly commented that while the way she manages projects didn't change much, she felt more prepared and empowered, especially when dealing with project stakeholders. She stated that systematic risk management gave her the ammunition and tools to communicate with stakeholders more effectively and raise their awareness of risks in projects:

> And so I think it just helped make concrete and, like, you know, lay out the probability, and lay out the responses, and lay out, well, I think we should, you know, do this, because this could happen, and honestly, I think it's likely. And just being able to expand upon it and clarify, I think, helped raise awareness to the other stakeholders. And it also helped me maybe phrase it better when I went to the client, or went to the account manager, and so on and so forth. You know, I think that helped me make it more powerful (Participant 4).

All participants felt like the risk management training improved their overall project management skills.

When asked whether additional risk management training might be beneficial, all participants responded that they did not feel that additional training was necessary because they can refer to the training materials as needed. However, three of the five participants thought that a review would be helpful after having completed a number of projects in which they managed risks.

5.1.3 Feedback on Risk Management Process and Templates

During the survey, participants were also asked whether they had any feedback about the templates that were offered to them during the training and the risk management processes. They did not have any specific feedback. One participant commented that the Probability-Impact Matrix was helpful. Another remarked that she was confused when exactly to start risk management, wondering whether she should start during the quoting stage, or only after the project has been approved. She also noted that she sometimes had trouble thinking what can go wrong with the project when identifying risks. Finally, one participant mentioned that while the risk register was very thorough, completing it can seem like an overwhelming task, compared to just diving into the project.

5.2 Quantitative Findings

5.2.1 Profit Margins

The desired gross profit margin for projects was set by ABC Inc. company management at 50% at the time when data gathering was initiated. The three-month average profit margin before risk management training and implementation were carried out was 50.70%. The three-month average profit margin after risk management training and implementation were carried out was 58.17%, which constitutes 14.73% increase over the pre-implementation three-month average. Gross profit margins per month and by quarter are presented in Table 5.12 below.

Table 5.12. Gross profit margins

Month	Gross Profit Margin	Summary
January 2012	49.80%	Pre-implementation 3-month average: 50.70%
February 2012	48.70%	
March 2012	53.60%	
July 2012	66.90%	Post-implementation 3-month average: 58.17%
August 2012	56.80%	
September 2012	50.80%	

5.2.2 Number of Risk Events in Reviewed Projects

During the analysis of structured interviews and the review of the project documentation submitted by the project managers, the number of risk events that occurred in the projects in this case study was counted. Some risks and risk events were documented in the risk registers that the project managers created and updated during the projects, while some were not and were discovered during the analysis of the interviews with the participants.

Risks and risk events were classified as identified during the risk identification stage or unexpected (i.e., risks that were not anticipated by the project managers). The results are presented in Table 5.13 below. To ensure that the investigator's interpretation was correct, a list of risks and risk events, as well as the total number of risks in each category was verified by the participants.

Table 5.13. Number of risks

Project ID	**Total # of Risk Events that Occurred**	**# of Identified Risk Events that Occurred**	**# of Unexpected Risk Events that Occurred**	**Total # of Identified Risks that did not Occur**
1	10	6	4	2
2	4	2	2	3
3	2	2	0	3
4	14	6	8	1
5	2	2	0	0
6	2	1	1	0
7	4	2	2	1
8	5	4	1	1
9	4	0	4	0
Total across all projects in which risks were managed from the start	**43**	**25**	**18**	**11**
Total across all projects	**47**	**25**	**22**	**11**

5.2.3 Risk Management Maturity Level Assessment

Risk Management Maturity Level Assessment software measures maturity levels across six perspectives: stakeholders, risk identification, risk analysis, risk responses, project management and culture. The output indicates the maturity level with respect to each

individual perspective. The overall level of maturity is determined by the level of the perspective that is the weakest (lowest). Levels of maturity are identified using the following percentage breakdown: *Naïve:* 0-25%, *Novice:* 25-50%, *Normalized:* 50-75%, *Natural:* 75-100%.

In this case study, risk management maturity assessment of participants was carried out before the risk management training was conducted to establish the baseline levels of maturity. After completion of the risk management training and conclusion of the implementation period, with the exceptions noted in the previous chapter, participants were assessed again to determine their most current maturity levels. The data received as the result of both assessments are presented in Tables 5.14 through 5.16 below.

Table 5.14. Risk management maturity level assessment results: Percentages

Perspective	Participant 1		Participant 2		Participant 3		Participant 4		Participant 5	
	Before	***After***	***Before***	***After***	***Before***	***After***	***Before***	***After***	***Before***	***After***
Stakeholders	24.81%	85.77%	28.85%	26.67%	14.62%	24.44%	18.00%	27.04%	25.20%	30.37%
Risk Identification	24.00%	88.00%	28.50%	80.00%	25.50%	49.50%	31.50%	64.00%	55.50%	42.50%
Risk Analysis	13.00%	84.71%	11.47%	54.12%	3.75%	42.35%	30.00%	48.82%	33.53%	28.24%
Risk Responses	5.77%	82.50%	9.23%	47.31%	6.92%	49.62%	25.38%	30.00%	41.54%	43.85%
Project Management	15.37%	87.80%	26.36%	41.79%	9.71%	40.98%	26.13%	44.32%	26.76%	15.37%
Culture	36.39%	96.84%	17.37%	42.89%	15.29%	37.11%	36.76%	44.47%	37.89%	41.32%
Overall Level	5.77%	82.50%	9.23%	26.67%	3.75%	24.44%	18.00%	27.04%	25.20%	15.37%

Table 5.15. Risk management maturity level assessment results: Maturity levels

Perspective	Participant 1		Participant 2		Participant 3		Participant 4		Participant 5	
	Before	***After***	***Before***	***After***	***Before***	***After***	***Before***	***After***	***Before***	***After***
Stakeholders	Naïve	Natural	Novice	Novice	Naïve	Naïve	Naïve	Novice	Novice	Novice
Risk Identification	Naïve	Natural	Novice	Natural	Novice	Novice	Novice	Normalized	Normalized	Novice
Risk Analysis	Naïve	Natural	Naïve	Normalized	Naïve	Novice	Novice	Novice	Novice	Novice
Risk Responses	Naïve	Natural	Naïve	Novice	Naïve	Novice	Novice	Novice	Novice	Novice
Project Management	Naïve	Natural	Novice	Novice	Naïve	Novice	Novice	Novice	Novice	Naïve
Culture	Novice	Natural	Naïve	Novice	Naïve	Novice	Novice	Novice	Novice	Novice
Overall Level	Naïve	Natural	Naïve	Novice	Naïve	Naïve	Naïve	Novice	Novice	Naïve

Table 5.16. Risk management maturity level assessment results: Percent of change

Perspective	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Stakeholders	245.64%	-7.56%	67.25%	50.21%	20.52%
Risk Identification	266.67%	180.70%	94.12%	103.17%	-23.42%
Risk Analysis	551.58%	371.79%	1029.41%	62.75%	-15.79%
Risk Responses	1330.00%	412.50%	616.67%	18.18%	5.56%
Project Management	471.43%	58.53%	322.17%	69.64%	-42.57%
Culture	166.13%	146.97%	142.61%	20.99%	9.03%
Overall Level	1330.00%	188.89%	551.85%	50.21%	-39.02%

These results are also represented graphically below in Figures 5.1 through 5.5. In the figures below, a horizontal interrupted line (- - - - -) is used to indicate the overall level of risk management maturity level before the training and an uninterrupted line (——) is used to indicate the overall level of risk management maturity after the intervention.

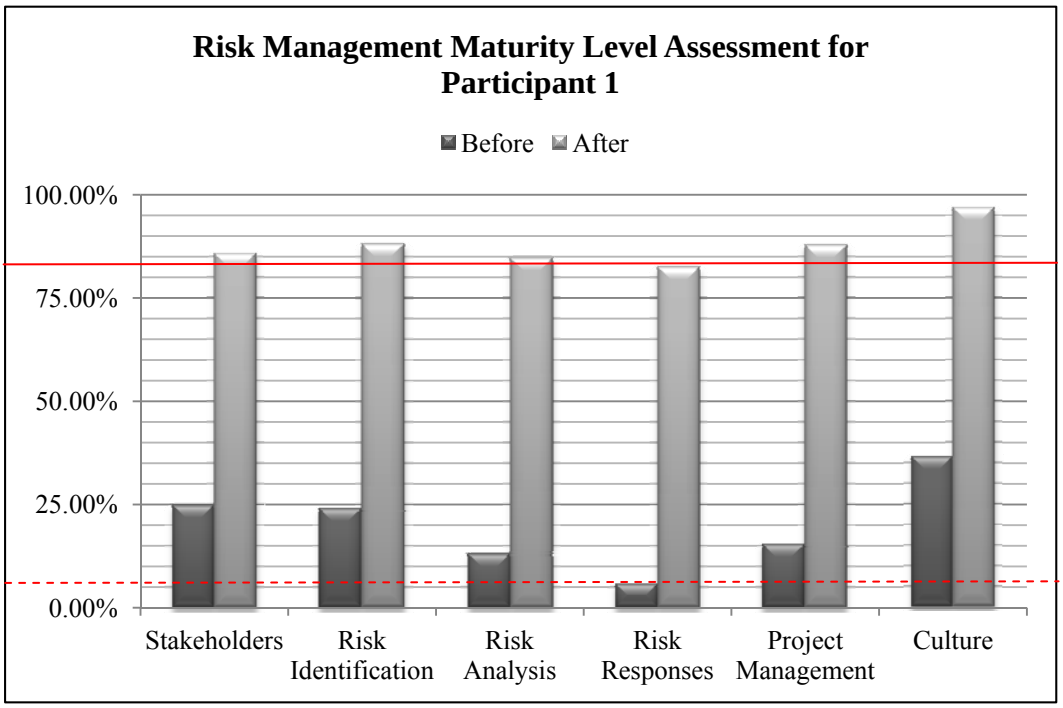

Figure 5.1. Risk management maturity levels before and after implementation for participant 1

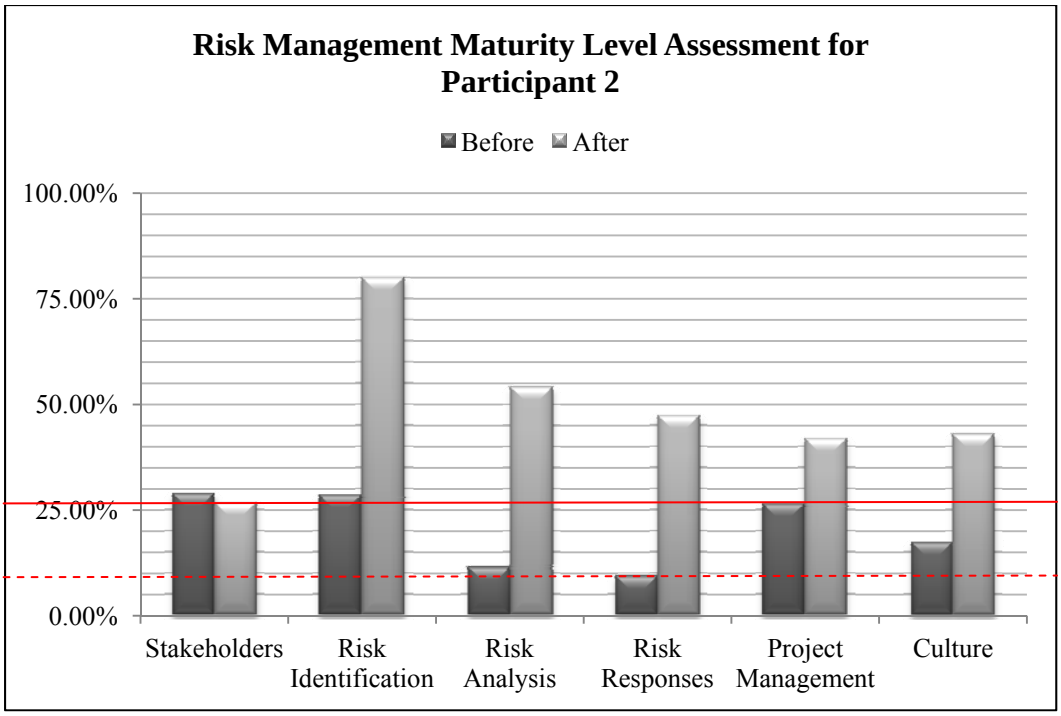

Figure 5.2. Risk management maturity levels before and after implementation for participant 2

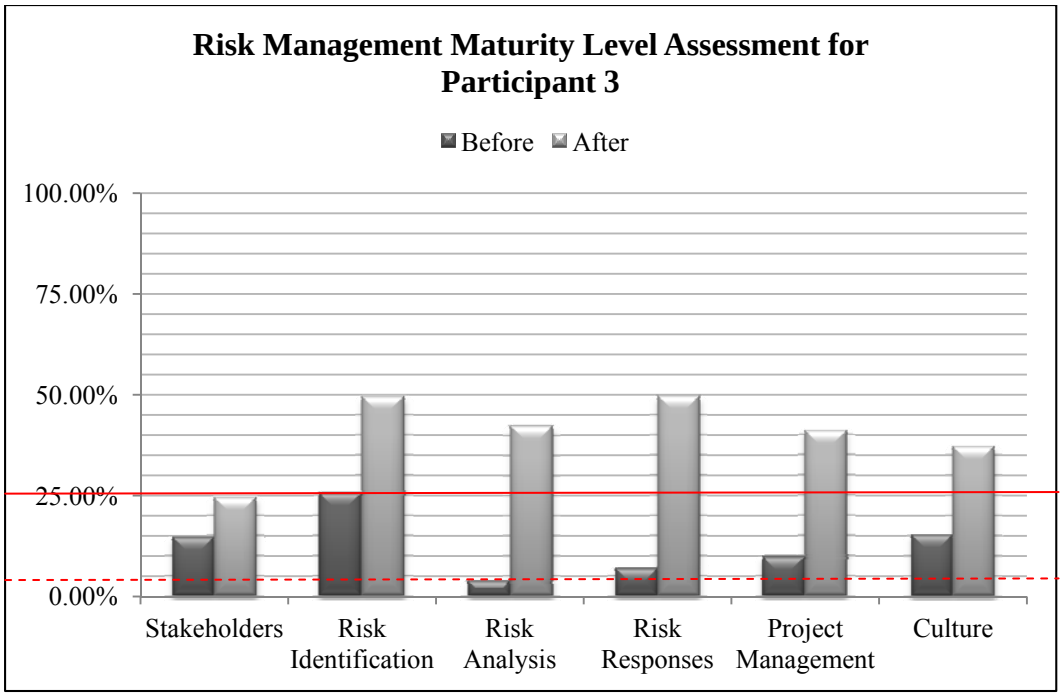

Figure 5.3. Risk management maturity levels before and after implementation for participant 3

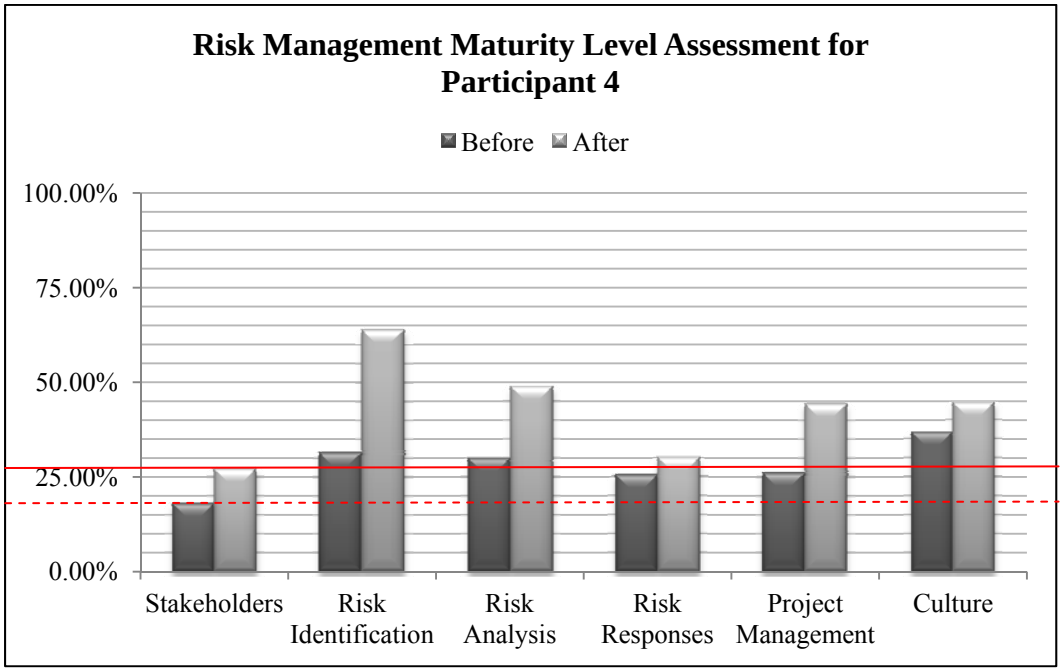

Figure 5.4. Risk management maturity levels before and after implementation for participant 4

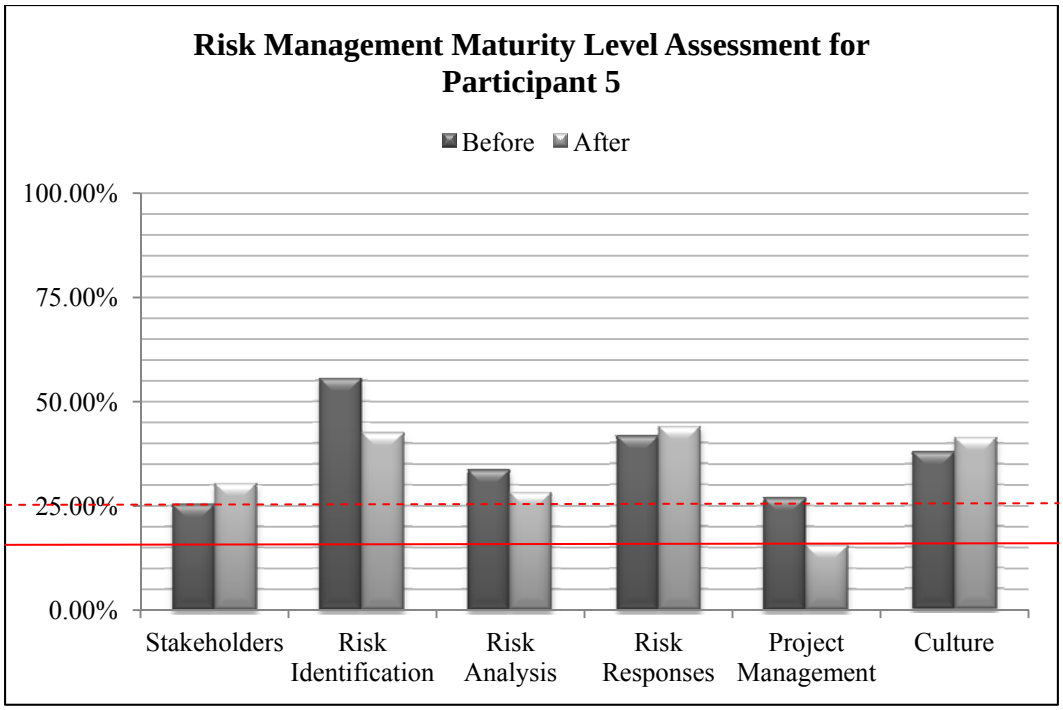

Figure 5.5. Risk management maturity levels before and after implementation for participant 5

CHAPTER 6. DISCUSSION, CONCLUSIONS, RECOMMENDATIONS AND FUTURE DIRECTIONS

6.1 Discussion of Findings

The main question that this research set out to explore was how a risk management program could be developed and implemented in a translation or localization company. This question led to several related questions, which were: (a) should an existing generic risk management approach, such as PMI's project risk management framework or ISO 31000 standard framework, be used by project managers working on translation and localization projects? (b) could a generic framework be used, and if so, how? (c) are translation and localization projects different from other projects and if yes, then how? And there are even broader questions, such as: do project managers even need to manage risks in translation and localization projects?

The first three chapters of this dissertation addressed and provided answers to these questions. However, it was not sufficient to merely answer these questions; it was also important to test in practice whether implementation of risk management in translation and localization projects could be done. To that extent, a case study was carried out. As a result of the case study, multiple types of data were collected. The data was presented in the previous chapter. The purpose of this chapter is to discuss whether the collected data can answer the research questions of this study, which are as follows:

- Was the implementation of systematic risk management by project managers successful? If so, then there should be a change in the risk management maturity levels and the data should confirm that a change has occurred.
- Was the risk sources model developed for translation projects useful for participants during the risk identification process? If it was, then the data should show that participants actively used the risk sources provided in the RBS document. Is there a need to modify the RBS model to improve its effectiveness?
- Was the risk management training effective and did it prepare the project managers to carry out risk management in translation and localization projects, or are there areas that can be improved in the training?

6.1.1 Verification of Risk Sources Model

The Risk Register template provided to the participants contained two columns for specifying the sources of identified risks. The first column, titled *Risk Sources* contained the top level categories, which were: Task [name of an activity, such as translation, editing, DTP, etc.], Project Management, Organization, External, Technology. The term "task" was used in the risk register instead of PMI's preferred term "activity" for reasons of terminological consistency with Microsoft Project and with the company management system, both of which are used by the participants daily, as well as to ensure consistency with legacy company documentation. However, during the training both terms were discussed, so that participants were aware of the synonymous meaning of both terms and PMI's framework preference for the use of "activity." The values in this first column

were pre-entered, so that participants could select the appropriate value from a drop-down list. Since only the common activity names were entered, an open value of "task" was written and could be overwritten by the participants, if an activity not included on the list was a source of risk. The second column, titled *Risk Category* allowed the project managers to manually enter more specific descriptions of sources of risks.

To verify whether the RBS model developed for this project was used by the participants, the sources and categories of risks and risk events specified by participants in the risk registers for projects one through eight were compared to the original RBS document. Risk events from project nine were not included, because the project manager did not create a risk register. Table 6.1 below presents the results of this comparison.

Table 6.1. Comparison of risk/risk event sources provided by participants with those specified in the RBS

Project #	Risk #	Risk (Risk Event) Description	Risk Source Identified by PM	Risk Source According to RBS	Risk Category Identified by PM	Risk Category According to RBS
1	1	Flare tags may not be processed correctly during MT[11] process	Technology	Same	Technical	Same
1	2	New page break strategy in Flare may not work for all sections in the manual	Technology	Same	Technical	Same
1	3	Japanese MT engine has new, limited data	Technology	Same	Technical	Same
1	4-6	MT post-editors are unfamiliar with the MT process specific to the customer[12]	Task Editing	Modified	Translation process	Same
1	7-8	Inconsistencies in the Japanese translation of the manual due to the use of two different post-editors	Task Editing	Modified	Translation process	Same
1	9	Preparation of the files for translation using the new page break strategy took longer than expected	Task Localization	Modified	Localization process	Modified
1	10	One of the Japanese post-editors did not have the required translation tool	Task Editing	Modified	Translation process, technical	Same
1	11	New Japanese editor not skilled in the use of the required translation tool and did not meet deadlines.	External	Same	Translation process	Same
1	12	The function of exporting for review from the required translation tool did not work	Technology	Same	Technical	Same
1	13	Unplanned overtime required of PM and localization engineer.	Project Management	Same	Planning	Same

[11] Machine translation

[12] The same risk was identified as having three distinct impacts and therefore was documented by the project manager under three different IDs.

Project #	Risk #	Risk (Risk Event) Description	Risk Source Identified by PM	Risk Source According to RBS	Risk Category Identified by PM	Risk Category According to RBS
2	1	Translator might become unavailable due to events beyond his or her control during the project (project is of long duration)	External	Same	Resources	Same
2	2	Translators might lose motivation or productivity might suffer due to the project's long duration	Task Translation	Same	Resources	Same
2	3	Lack of qualified translators who use the required CAT tool	Project Management	Same	Resources	Same
2	4	Incomplete source materials	External	Same	Input	Same
2	5	The software interface had been translated several years earlier, but the status of its previous translation is unknown	Organization	Same	Input	Same
2	6	The client was planning a software update and an update to the manual	External	Same	Input	Same
2	7	Disagreement between translators on how to handle user interface references in translation	Task Editing	Modified	Input	Same
2	8	Project delay beyond current calendar year can lead to billing issues	External	Same	Customer	Same
3	1	Unreliable TM (with potential false 100% matches)	Project Management	Same	Technical/ quality	Same
3	2	Team's familiarity with client's materials may lead to ignoring of instructions specific to this project	Project Management	Same	Technical/ quality	Same
3	3	Previous translation of name plates, used to identify equipment, is not available	External	Same	Customer/ customer misunderstan-ding of needs, scope, schedule, quality requirements	Same
3	4	Team members have no previous experience with the required CAT tool.	Technology	Same	Translator tool knowledge	Different

Project #	Risk #	Risk (Risk Event) Description	Risk Source Identified by PM	Risk Source According to RBS	Risk Category Identified by PM	Risk Category According to RBS
3	5	No previous experience using required CAT tool on FrameMaker files for this customer	Technology	Same	Technological change/ performance and reliability	Modified
4	1	Confusion, lost/missing files or deadlines due to translators' lack of familiarity with the company management system and file hand-off processes	Technology	Same	Training	Different
4	2	Late deliveries or bottlenecks due to the unproven reliability of new translators	External	Same	Subcontractors and suppliers/ reliability	Same
4	3	Translation inconsistencies due to the large size of the translation teams and the use of multiple editors	Task Translation	Same	End-user response	Same
4	4	As a result of the amount of instructions (non-translatables, handling specific words, etc.), client's requirements might not be met	Organization	Same	Material	Different
4	5	Above-average daily throughput expectations resulting in an aggressive timeline	Project Management	Same	Controlling time/schedule	Same
4	6	Inconsistencies and errors introduced during client review of terminology	Task Terminology Development	Modified	Process=> Review knowledge=> Translation/ terminology experience	Different
4	7	Loss of potential business from current customer, if expectations are not met and communication is lacking during the project. Opportunity to be introduced to the customer's parent company can be lost.	Project Management	Same	Communication	Same
5	1	Customer might decide to update the source files after translation of the source file has already started	External	Same	N/A	N/A
5	2	Localization schedule overruns	Task L10n	Modified	N/A	N/A

Project #	Risk #	Risk (Risk Event) Description	Risk Source Identified by PM	Risk Source According to RBS	Risk Category Identified by PM	Risk Category According to RBS
6	1	Missing text from images due to the text being typed up manually, instead of extracting text automatically using special stand-alone software or built-in or add-on filters	Task DTP	Modified	N/A	N/A
7	1	New, unqualified translators into Burmese, which could lead to substandard translation and/or schedule delays	External	Same	N/A	N/A
7	2	Potential for incorrect handling of brand names and trademarks due to lack of specifications provided by the customer	External	Same	N/A	N/A
7	3	Burmese characters might not display correctly in the customer's version of Microsoft Word	Technology	Same	N/A	N/A
7	1	File path was automatically updated in one of the documents and reflected internal server file structure, rather than the customer's	Project Management	Same	Scope	No
7	2	The customer requested an additional service, translation certification, which was outside of the original project scope	External	Same	Client	Same
8	1	Using a translator who is new to the customer's project	External	Same	Alternative suppliers	Different
8	2	New project manager	Organization	Same	Staff changes	Different
8	3	Exclusion of 100% matches from editing scope	Task Editing	Modified	Scope	Different
8	4	Exclusion of unchanged files from project scope	Project Management	Same	Scope	Different
8	5	Limited availability of localization manager	Task L10n	Modified	Scheduling	Different

The majority of the risk sources and categories identified by the participants were taken directly from the RBS created in this study. Some risk sources, such as *task Editing*, *task TerminologyDevelopment*, *task L10n*[13], *task DTP* were not included in the RBS presented in chapter three, but they represent modified risk sources based on specific activities carried out at ABC Inc. These task-specific risk sources were included in the Risk Register template, because editing, terminology development, localization and desktop publishing are frequent activities in projects performed by ABC Inc. Because the majority of risk sources and risk categories identified by the participants were the same or similar to the ones presented in the RBS document, it is clear that all participants were using this RBS document as a reference when identifying risks.

The risk source for both risks #1 in project seven and risk #4 in project eight was specified by the participants as *project management* and the risk category was documented as *scope*. *Scope* is not a risk category that was included in the RBS. The actual source of the first risk in project seven is determined incorrectly. It should be *technical/technology*, since the event that occurred has to do with the technology (software used in the project not functioning as expected). The source of risk #4 in project eight is determined as *project management*. The category specified by the project manager is *scope*, but the project manager did not specify where precisely the uncertainty lies: the exclusion of the files that did not change is a definitive cause, rather than an actual risk. The risk is that internal inconsistencies between previous translation and

[13] L10n is an abbreviation of "localization" frequently used in the language industry.

translation performed during this project may occur because of the exclusion of previously translated files. In this case, the source of the risk is the translation activity. To be more precise, the source of the risk is the translation process specific to this project. This risk did not materialize.

The sources of risk #4 from project four and risk #2 from project eight are organizational. The project manager specified the category of risk #4 in project four as *material*. However, in reality the project manager was concerned about his/her ability to control the fulfillment of customer requirements, which means that the source of risk is *project management* and the risk category is *monitoring and controlling*. In case of the second risk in project eight, the project manager was concerned with staff changes, so specifying the source of risk as related to organization is correct. Staff changes can be placed as a subcategory of *human resource-related* risks. The category determined by the project manager is not at odds with the RBS; it is simply identified on a more granular level than what was offered to the participants in the RBS.

Much like risk #2 in project eight, the category of risk for risk #6 in project four is determined on a much more granular level than offered in the RBS template.

The risk categories for risks #3 and #5 from project eight are different from those defined in the RBS and are recorded as *scope* and *scheduling*. The source of both risks is the *task* (editing and localization). Risk #3 is very similar to risk #4 in the same project—the impact is described in a similar way, just on a different level (sentence level vs. file level):

- Impact of risk #3: There may be internal inconsistencies between old and new segments.
- Impact of risk #5: There may be internal inconsistencies between old and updated files.

In both cases, the risk was not described correctly and the source of the risk is the translation process. However, the project manager was successful in avoiding the risk by providing the translator with access to the previous translation.

Risk #5 in project eight is an *organizational*, *human resource* risk, rather than a *localization-related* risk, even though the project manager defined it as *task L10n/scheduling* risk. While the risk originates in the busy schedule that the localization manager has, this schedule is filled with multiple projects, so the source of risk is the localization manager's availability to participate in project eight when needed. So the source lies in the organizational schedule priorities and availability of a specific human resource to carry out activities in a specific project.

The review of the risk descriptions, sources and categories defined by the participants in the risk registers showed that there were a few risk sources and risk categories that differed from the RBS, but they were a minority. Out of 43 recorded risks and risk events (see Table 6.1), there were ten risk sources (23%) that were modified, but were still based on the RBS, while the remaining 76.7% of risk sources precisely match those defined in the RBS. For these same 43 recorded risks and risk events, two risk categories were modified, but were still based on RBS categories (4.7%); six categories

were undefined (14%) and ten categories differed from those provided in the RBS (23.3%). Of the ten risk categories that differed from the RBS provided, only four were defined correctly. Twenty five risk categories were the same as specified in the RBS, which constitutes 58% of all risk categories. These results are summarized in Table 6.2 below.

Table 6.2. Comparison of risk sources and categories defined by participants with categories provided in RBS

	Same as in RBS	**Modified**	**Different**	**Undefined**
Risk Sources	33 (or 76.7%)	10 (or 23%)	0	0
Risk Categories	25 (or 58%)	2 (or 4.7%)	10 (or 23.3%)	6 (or 14%)

Considering that a significant majority of risk sources (76.7%) and risk categories (58%) were defined consistently with the RBS provided to them, it is clear that all the participants used the RBS document to identify risks and their sources.

The use of additional categories, especially ones that are more granular than those provided in the RBS, such as for risks #4 from project six and risk #2 from project eight, is a positive sign, because it means that the participants did not follow the RBS as a simple checklist, and instead were looking at the risks within the context of their specific projects. Using the RBS template as the definitive checklist is dangerous as it could limit the risk identification process and lead project managers to miss a source of risk that might be relevant for the project at hand, without being captured in the generic RBS.

6.1.2 Impact of Risk Management Program Implementation

To determine whether the implementation of systematic risk management by the project managers was successful, results of the risk management maturity level assessment were analyzed and triangulated with the qualitative data collected in interviews. At first, each individual perspective of the assessment was reviewed and then the overall levels were evaluated. As mentioned above, if the implementation of systematic risk management had an impact, then there should be a change in the levels of all of the individual perspectives, and of the overall risk management maturity level as well.

6.1.2.1 Risk Management Maturity Level Assessment: Stakeholders Perspective

The stakeholder portion of the assessment focuses on the role that stakeholders play in the risk management process. Stakeholders in a typical project for ABC Inc. include the client commissioning the final output (typically, a translation), the end user or reader of the final output, subcontractors (translators, editors, proofreaders, etc.), internal team members (localization manager, production manager, sales manager, etc.), and, of course, ABC Inc.'s management (company owner).

The results for all but one participant show an increase in *Stakeholders* perspective. The results of the first participant show the most drastic increase—from *Naïve* level to *Natural* (a 245.64% increase over the original). When discussing one of the projects, participant 1 made comments regarding stakeholders' deep commitment to the project:

> I think the team really jelled well. You know, they really became a well-functioning engine, which was nice. … This was one [project] that we really rose to the occasion and we nailed it. And when the client wrote back … they were absolutely thrilled with our work.

During this project, the project manager created a project risk management plan and a risk register (see project report #4 on pages 158-163 for details). Risk owners were assigned for all the identified risks. The project manager also carried out all risk management processes and, despite the large number of unexpected risks events that occurred during the project (eight risk events vs. six identified in advance), the project manager believes that the project would have been less likely to succeed without the systematic application of risk management.

The results of the assessment of participant 2 show a decrease of 7.56% over the original for the *Stakeholders* perspective. The level, however, did not change: *Novice*. During the interview, this participant did not mention anything related to stakeholders when discussing the projects. However, when asked about whether any additional training is necessary, this participant remarked while she didn't think additional information would be necessary, she thought a review would be useful, especially a review of the one area that she found problematic, which was assigning the ownership of risks:

> *Participant 2*: I don't know that anything else other than what we've done already is needed. I think that it would be good to review what we did earlier this year. I'd like on my own time to go back and look at some of the areas that I was struggling with.
>
> *Researcher*: What are the specific areas that you were struggling with?

> *Participant 2*: Well, I would say… covering strategies for dealing with the risk, and who handles the risk, you know, who owns the risk.

The review of the risk registers shows that this participant assigned risk ownership for some of the risks to the company (ABC Inc.), rather than to a specific person, which means that the ownership of those risks was not taken by anyone. One of the improvements that can be suggested in this case is to ensure the clarity of risk ownership for every identified risk. This project manager did not submit any project risk management plans, risk reports or lessons learned documents for the projects discussed during the interviews, so it is unclear if communication of risk information is a factor that might have contributed to the decrease in the *Stakeholders* perspective.

The results of the remaining three participants show an increase of 20-67% over the original in *Stakeholders* perspective. For two of these participants there is an increase from *Naïve* to *Novice* level. During the interviews the participants whose scores demonstrate this increase acknowledged the importance of involving stakeholders in the project and of doing so regardless of how challenging it might be. For example, participant 4 said:

> …it kind of helps to lay it [risk information] out—but I think part of the problem is getting the other stakeholders to pay attention and take it seriously. Because, you know, we can throw it out there to the account manager, we can throw it out to the vendors, to the client: "hey, this might happen, you know, and it could affect this," but, you know, when it comes to clients, it's kind of sometimes just about the bottom line: just get it done. And, you know, with vendors, it's, OK, well, I just want to get the translation, the editing done, et cetera. So I think it's just a matter of making people sit up and pay attention to it. And I don't necessarily know how to get the other stakeholders to do that. But I feel like

> sometimes it [risk management] falls more, only on the project manager's shoulders. And I think it needs to be shared a little bit more.

6.1.2.2 Risk Management Maturity Level Assessment: Risk Identification Perspective

Identification of risks is a fundamental step in project risk management. The challenge for project managers is to find a balanced approach in what level of risks are identified with respect to the granularity of risk identification and the number of risks that are identified (not too many that they become a burden to manage, but also not too few; otherwise critical risks can be omitted).

The results of four out of five participants show a significant increase in the *Risk Identification* perspective:

- Participant 1: 266.67% increase; and a shift from the *Naïve* to the *Natural* level
- Participant 2: 180.70% increase; and a shift from the *Novice* to the *Natural* level
- Participant 3: 94.12% increase; the *Novice* level remains, but the increase is almost a full level.
- Participant 4: 103.17 % increase; and a shift from the *Novice* to the *Normalized* level

These increases show that a significant change has occurred in how the participants identify risks or that they now identify them, as compared to before the training and implementation, when formal risk identification did not occur. In the eight projects discussed during the interviews (see Table 5.13 above), in which risk management was carried out from the start, two projects did not experience any

unexpected (not previously identified) risk events. In two of these eight projects most of the risk events were identified during risk identification and only in one project more unidentified than identified risks occurred.

During the interviews, the participants acknowledged the importance of the risk identification process in risk management. For example, participant 1 remarked that in one of the projects discussed, she was more likely to test the software (required translation tool) on a specific file type, since the company was using that software with this particular file type for the first time and it was risky. Participant 4 commented that identifying risks up front was beneficial:

> So I think having to actually sit down and identify them as risks and identify them more thoroughly and the potential problems that would result, including any potential secondary problems, I think that helps us take it more seriously from the get-go.

Participant 3 also noted that risk identification was not a simple task and that not all risks that occurred could be identified up front:

> Sometimes I also find it hard to actually think about: ok, which things can really, really go wrong? And, you know, there are other projects in which you, you didn't even foresee this stuff that happened and there was no way of logging it, I guess.

The results of participant 5 show a decrease of 23.42 %; from the *Normalized* to the *Novice* level for the *Risk Identification* perspective. However, this is the participant who did the initial assessment while undergoing new employee training and who did not manage any projects until after the training, so it is likely that the original assessment reflected this participant's perception and expectation of the process of risk identification,

rather than actual practice (since this participant had no prior experience managing projects at ABC Inc.)

6.1.2.3 Risk Management Maturity Level Assessment: Risk Analysis Perspective

Risk analysis allows a project manager to prioritize risks, among other things. During the risk management training carried out as part of this study, project managers were introduced to the use of a Probability-Impact Matrix, which is a qualitative approach to risk analysis. As Hopkinson notes, "a purely qualitative risk assessment approach will not support a risk management capability greater than RMM Level 3" (2011, 127). Therefore, it was not expected that the results of the assessment would show level 4 of risk management maturity without the introduction of a quantitative method of risk analysis.

Similarly to the *Risk Identification* perspective, for four of the five participants there was an increase in the *Risk Analysis* perspective:

- Participant 1: 551.58 % increase; and a shift from the *Naïve* to the *Natural* level
- Participant 2: 371.79 % increase; and a shift from the *Novice* to the *Normalized* level
- Participant 3: 1029.41 % increase; and a shift from the *Naïve* to the *Novice* level
- Participant 4: 62.75 % increase; the same level (*Novice*) remains

When asked for feedback on risk management processes, participant 2 noted that she found risk analysis a helpful step in risk management:

> *Researcher*: Do you have any feedback about the risk management processes as they were applied in this project?

> *Participant* 2: Not really. I found the severity and probability table to be probably most helpful.

Similarly, participant 3 made a comment that while she already did a lot of steps in risk management in her head prior to the training and implementation, risk analysis was something that was new and she found it helpful:

> *Researcher*: Did the training prepare you carry out risk management in translation project?
>
> *Participant* 3: Yes, I think it did. I mean, most of these things I already have them on my mind all the time, but there were other things that… like how to assess like if it's a medium risk or high risk, or stuff like that. I think that was very helpful, yes.

Participant 4 did not have an opportunity to document a complete formal risk analysis for the project discussed during the interview. However, an increase on the risk analysis perspective shows that this participant's understanding of risk analysis and of its importance changed.

The results of participant 5 show a decrease of 15.79 % in the *Risk Analysis* perspective; but the *Novice* level of this perspective remains. As mentioned earlier, this participant completed the initial assessment while undergoing new employee training and did not manage any projects until after the training. As in the case with the *Risk Identification* perspective, it is likely that the baseline assessment, which the participant underwent before she managed any projects, reflected this participant's perception and expectation of the process of risk identification, rather than actual practice. So, only after she had an opportunity to manage a number of projects, her levels truly reflected the actual practice, rather than her perception of how the practice happens.

6.1.2.4 Risk Management Maturity Level Assessment: Risk Responses Perspective

Implementation of risk responses when risks occur or are about to occur is critical to the success of risk management. Even if the original response planned to address a risk is appropriate and promises to be effective, its effectiveness will never be realized unless that response is implemented as planned and when necessary. For these reason, the part of the assessment that addresses risk responses covers both selection of effective responses and their implementation.

The results of all five participants show an increase in the *Risk Responses* perspective. Three of the five graphs show an increase of at least one level:

- Participant 1: 1330.00 % increase; and a shift from the *Naïve* to the *Natural* level
- Participant 2: 412.50 % increase; and a shift from the *Naïve* to the *Novice* level
- Participant 3: 616.67 % increase; and a shift from the *Naïve* to the *Novice* level

The interviews confirmed the participants' understanding of the importance of this particular risk management process and their focus on developing effective responses. For example, during the interview, participant 2 acknowledged that lack of effective risk responses for risks in a project directly impacts the success of risk management carried out in that project:

> I didn't do an effective job of coming up with responses to the risks that I identified. So it could've been more effective. And in the end, since the responses were not effective, it probably wasn't much different than project for which I did not do formal risk management (Participant 2).

Most of the participants mentioned that they implemented the responses that they developed, and although some of their responses had to be slightly modified, they noted

that most of the responses implemented for the risks that occurred during the projects discussed in interviews were effective.

The results for participant 4 and 5 show a small increase over the original values in the *Risk Response* perspective—by 18.18% and 5.56% respectively, and both remain at the same, *Novice*, level. Participant 4 did not have an opportunity to proactively manage risks in the project discussed during the interview. However based on the risks that occurred in the project discussed during the interview, the project manager had already started planning for the next (related) project to be undertaken on behalf of the same customer:

> [P]roactively I'd like for us to be having a wider pool of vendors to choose from in certain languages. But I would say I would just need to be more forceful and stringent about the deadlines when it comes to some vendors. ... When it comes to this client, you almost always have to buffer a little bit of money, because it's almost inevitably used and I also learned when it comes to localization time, when it comes to the schedule at least, not the actual time used, to take the schedule that you are given by the vendor and definitely add a little bit of leeway, because inevitably more time is needed due to other demands upon that vendor (Participant 4).

This statement also provides some evidence of a change in culture that occurred: this project manager is thinking about risks beyond a particular project.

6.1.2.5 Risk Management Maturity Level Assessment: Project Management Perspective

This part of the assessment focuses on how risk management is aligned with other project management activities. According to Hopkinson, this portion of the assessment focuses on the maintenance of project risk records, the quality of risk reporting, the use of risk

information for cost forecasting, the relationship between risk and project plans, and the alignment of risk management process with the purpose of the project, among other things (2011, 179).

Four out of five participants show improvement in the *Project Management* perspective. The changes, which exhibit significant differences, are as follows:

- Participant 1: 471.43 % increase; and a shift from the *Naïve* to the *Natural* level
- Participant 2: 58.53 % increase; the *Novice* level remains
- Participant 3: 322.17 % increase; and a shift from the *Naïve* to the *Novice* level
- Participant 4: 69.64 % increase; the *Novice* level remains
- Participant 5: 42.57 % decrease; the *Novice* level remains

The review of the risk registers shows that practice differs from project manager to project manager. Some consistently reviewed and updated risk registers. Others performed initial entry of the identified risks, risk analysis results and risk responses, but did not enter into the registers newly identified risks or unidentified risks that manifested themselves over the course of the project, instead using other project documentation, like lessons learned logs, to capture that information, or did not capture this information at all. This inconsistent practice is not just between project managers, but also occurs from project to project and could be due to project managers still learning how to fit the new processes and newly acquired knowledge into their every day management of projects. Regardless of the reason, one of the recommendations for improvement would be to document risk information more consistently.

Interviews show that the size and complexity of projects plays an important role in PMs' decisions about how much risk management they do. For example, participant 2 commented that she hadn't changed how she managed certain small projects, explaining this hesitance or resistance to change primarily by time limitations, her high familiarity with such small projects and similarity of challenges in such projects:

> Well, a lot of my small projects are, like, for [customer name], you know, it's the same thing over and over again, so I don't feel like it would really be effective, because I already know what to expect. And I have for that particular project several translators and editors who can work on this project in case somebody is busy or something happens, and several DTP vendors who are familiar with [customer name]. And part of it is too that I've been so busy that even the 5 minutes to fill out the risk register, sometimes I just don't have it.

Other participants remarked that employing systematic risk management forces them to think more about what can go wrong in projects:

> I guess it helped me to better understand like how these risks will affect the project …think about it even more. Like, ok, there is something that is really going to impact it and in what sense (Participant 3).

> Like I just said, when these things were in the PM's mind and you are kind of walking through, when you actually take these thoughts and you write them down, but in the specific formula… I actually use the formula that we got during the training, that was like: as a result of … And actually formulating it like that and putting the risks in that manner, it does help. So, yeah, I would say that has had an effect (Participant 1).

As mentioned above, the results of one of the participants show a decrease in the *Project Management* perspective. When discussing risk management training during the interview, this participant commented that while she felt that the training gave her the needed information, because she had not managed any projects before undergoing the

training, and undergoing all the training at once, she felt overwhelmed and when she finally had a chance to practice what she learned, a lot of information was forgotten:

> I feel like it gave me … but certain things come with practice, from doing things multiple times. And I feel like there was a pretty significant gap between the theory, which came all at once, and the practice, which came … Maybe it was because of the way I was hired. It was a while that I received my risk management training and I still haven't managed a large project. But I feel like, by the way I got to manage them, some of them I forgot them. I had a hard time remembering where they were (Participant 5).

This gap between the theoretical information received and the practice that could only be acquired after the training is likely the explanation for the drop in the risk management maturity level on *Project Management* and other perspectives that are seen in this participant's results.

6.1.2.6 Risk Management Maturity Level Assessment: Culture Perspective

Risk management culture includes both understanding of risk management and active participation in risk management process within the company (as opposed to simply following required steps). If a company has a strong risk management culture, it has a solid foundation on which risk management can be developed and improved. Building that risk management culture, therefore, was an important objective of the risk management training conducted as part of this case study.

According to Hopkinson, a weak risk management culture can "undermine any aspect of the risk management process" (2011, 199). For this reason, the creators of the assessment focused more questions on this perspective than on any of the others, making

the score of this perspective "a good general indicator of the health of the overall process" (2011, 199).

Graphs for all participants show an improvement in this perspective:

- Participant 1: 166.13% increase; and a shift from the *Novice* to the *Natural* level
- Participant 2: 146.97% increase; and a shift from the *Naïve* to the *Novice* level
- Participant 3: 142.61% increase; and a shift from the *Naïve* to the *Novice* level
- Participant 4: 20.99% increase; the *Novice* level remains
- Participant 5: 9.03% increase; the *Novice* level remains

The smaller increase in the assessment of participant 4 can be attributed to the small amount of time that elapsed between the start of implementation (May 2012) and the post-implementation assessment (late June 2012). Since this participant was leaving the company, there was insufficient time for the implementation to run and affect her risk management culture. Nevertheless, when asked for feedback about her risk management processes as they were applied in the project discussed during the interview, this participant remarked that they were helpful, even though applied retroactively:

> It was clear, you know, update as you go, identify at the beginning, continually monitor, continually update. I mean, it all made sense; it all, you know, was helpful, even retroactively. So… I kind of wish we'd had it in place a little earlier (Participant 4).

The lack of time she had to internalize the information received during the risk management training and incorporate what she learned in her everyday practice shows in another comment made by this participant:

> I think the risk register, it's very thorough, but at times it's a little overwhelming, because there are so many things and it's almost a little daunting to think how much time it would take to fill that out, as opposed to actually just diving in. And while I think it's important, it just is intimidating to the project manager when they are trying to, you know, go-go-go, get things started. But I don't know what could be done to lessen that feeling (Participant 4).

As mentioned above, participant 5 did not have experience managing projects at ABC Inc. prior to undergoing the training and undertaking the initial assessment, so the changes in the maturity levels that are noticed on this participant's graphs can be attributed to many factors, such as the gap between theory and practice, the gap between expectations set and perceptions formed during the training versus the reality of managing projects and applying knowledge acquired during the training, or possibly others. However, a couple of comments that this participant made during the interview show that she understands the value of risk management and that she is thinking beyond checking risk management processes and actions off her to-do list. For example, she was already thinking how these processes could be improved and adapted better for the needs of project managers at ABC Inc.:

> I think it's a great idea to stop and think before starting a project. The process itself is conducive for that.
>
> …it would be nice to have a web-based checklist: ok, are there any problems with the source files? And you fill out… Are there problems with this or that. I felt like I had to open the presentation [from the training], because I was afraid I missed something (Participant 5).

Other participants made comments that underscore the fact that risk management had become part of the culture, rather than just another add-on set of activities burdening

project managers. When asked whether the risk management training improved her skills, participant 2 responded that it did:

> Yeah, I think in making me more aware of how risk management can help, you know, not so much technical skills, but more in the sense of this, like, this is something else I need to think about with project planning.

In regard to additional training, she couldn't think what kind of any additional risk management training would be of use for her at that point. However, she noted that having a risk management review session would be helpful:

> I don't know that anything else other than what we've done already is needed. I think that it would be good to review what we did earlier this year. I'd like on my own time to go back and look at some of the areas that I was struggling with (Participant 2).

Likewise, participant 1 commented that a review session would be useful. It would reinforce the concepts and improve the level of risk management further:

> But I think a follow-up, or like a… you know, some kind of follow-up. Six months, even a year later would be a good idea, just to make sure that everybody is still doing it, they are doing it properly. And after, 'cause after you've done it a couple times, you have a better idea for it. When it's presented as a new material, you know, it's kind of like walking in the dark. You bump into things here and there. But after you've done it a few times, you have a much more clear idea of what the plan is, what you are doing. **And I think following up on that can reinforce and kind of push the quality level higher**. (Emphasis added)

6.1.2.7 Risk Management Maturity Level Assessment: Overall Maturity Level

According to Hopkinson (2011) the overall maturity level is determined by the level of the weakest perspective. The results of four out of five participants indicate a risk management maturity level of *Naïve* prior to the training and implementation. The results of the assessment of the fifth participant reveal the *Novice* level of risk management

maturity. After the training and implementation, the assessment output graphs show changes in the overall risk management maturity levels of four of the five participants. However, the magnitude of the changes of the risk management maturity levels differs among these four participants.

- Participant 1: *Natural*
- Participant 2: *Novice*
- Participant 3: *Naïve* (borderline with *Novice*)
- Participant 4: *Novice*
- Participant 5: *Naïve*

Because the differences between project managers are noticeable, it can be concluded that the training and risk management implementation had a different impact on the practice of project managers. Project risk management documentation provided by the first participant was the most extensive and included a project risk management plan and lessons learned documents. During the interview this participant also showed that she did not just implement processes and use templates in her projects, but also reflected a lot on her project management practice and skills. She was one of the participants who requested my feedback during the implementation process. The active implementation process, reflection on practice and more detailed documentation of risk management information (when compared to other participants) are the most likely factors that contributed to the significant increase in risk management maturity level of this participant (from *Naïve* to *Natural*).

Participants 2 and 4 showed a one-level increase during the post-implementation assessment. Their interviews revealed that they were also committed to carrying out the risk management processes, and reflected on those processes, but acknowledged that some aspects of risk management they could not carry out, primarily due to the time and other constraints. For example, participant 4 left the company one month into the implementation period. Even though she did not have as much time as others to implement risk management in projects that she managed, she still underwent the same assessment procedures as other participants, such as an interview and risk management maturity level assessment. Her responses during the interview show critical reflection on her project management practice, as well as small changes in her practice. For example, when discussing one project in which only ad-hoc risk management was conducted, she showed that she is thinking about risks and how to manage them beyond the bounds of that particular project by having suggestions about improving management of the next related project (or projects) for the same customer, despite the fact that she was not the one who would be managing that project (or projects). It is likely that if this participant had the same amount of time before the post-implementation assessment as the rest of the participants, larger effects of the risk management training and implementation would be apparent.

Participant 2 only applied risk management in larger projects and she acknowledged that there were some shortcomings in the initial planning and assessment stages, which reduced the effectiveness of the risk management processes.

The graph of the third participant does not show a change of the overall risk management maturity level. However, the graph shows an increase within the same level, which is from 3.75% on the *Risk Analysis* perspective to 24.44% on the *Stakeholder* perspective (a 551.73% increase over the original). During the interviews this participant commented that while her everyday project management practice did not change much, after the training and implementation she had a better understanding of how risks could impact the project. She also noted that the nature of the particular projects she managed during the implementation period was such that the projects did not lend themselves well to exploring the potential benefits of risk management.

While there is no increase in the overall maturity level of the third participant, two changes that occurred show that the training and the implementation already had a positive impact. The first change is the shift of the lowest perspective from *Risk Analysis* to *Stakeholders*. It appears that involvement of stakeholders in risk management is the weakest point for ABC Inc.: the increase of maturity level for this perspective is the smallest for three participants and for two participants there is a decrease in maturity level. This weak point can most likely be explained by the nature and the structure of the language industry. First, most team members are external contractors, who come from different cultural backgrounds. External contractors are harder to motivate to participate in risk management, since they view it as an unnecessary burden and a cost that they will not be compensated for (stagnant industry rates do not help the motivation). In addition, by their nature, translation/localization projects bring together people from different

cultural backgrounds. As mentioned above, risk is a social construct, views of risk and attitudes toward risk vary from culture to culture. Being from different cultures, external subcontractors do not necessarily share business culture and business culture values, even when they work for the same company consistently. All these factors contribute to the challenges of motivating subcontractors to become active participants in risk management, despite the potential benefits they can derive from it. Another challenge, this time with the translation/localization buyers, is that they are more accustomed to taking the "throw-it-over-the-wall" approach to projects, either because they are not used to being actively engaged by their language service providers, or because their own internal silos prevent cross-functional cooperation, or because of lack of understanding of the complexities involved in translation/localization.

The second change that can be seen on the graph of the third participant is the increase in the score in the *Culture* perspective. As mentioned above, the creators of the assessment underscore the importance of this particular perspective over the others by giving it the most weight. Despite the differences in all the participants' results, there is an increase in this perspective for all participants.

The results of the fifth participant show a decrease in the overall risk management maturity level. This participant did not have project management experience at the time of undergoing risk management training and had to undergo this training alongside the new employee and advanced project management training about a month after the rest of the participants had already completed their risk management training. Despite this, I

made the decision to carry out the same procedures as with the other participants. I expected that the results of the assessments before and after the training would be inconsistent with the results received from other participants. And indeed, three of the six perspectives on the risk management maturity level assessment show a small decrease. These perspectives are *Risk Identification*, *Risk Analysis* and *Project Management*, while other perspectives, *Stakeholders*, *Risk Responses* and *Culture* show a marginal increase. It is possible that these results are due to the need to adjust expectations and perceptions formed during the training to bridge the gap between theoretical knowledge and practice, because this participant did not have project management experience on which to base the pre-implementation assessment. However, it must be noted that this participant did implement risk management consistently in the projects she managed, even though the projects were of small size and relatively simple (involving few languages and small teams).

6.1.2.8 Profit Margins

While measuring project profit margins in the three months that followed risk management implementation showed an increase of 14.73% over the gross project profit margins prior to the implementation of systematic risk management, it is too gross a measure to serve as a high-confidence indicator of the direct impact of risk management on profitability of projects.

First, it is not possible to say with a high level of confidence whether this increase was solely due to the implementation of the risk management program. There are other

factors that might have contributed to the change, such as strategic margin-related decisions that the sales team might have made on certain projects or budget overestimates by the project managers. And second, when determining post-implementation profit margins, it was not possible to separate projects in which risk management was and was not carried out. The numbers for post-implementation included profit margins of some projects, which were initiated prior to the risk management training and therefore did not have risk management managed systematically.

A more precise determination of the impact of risk management implementation on project margins could be achieved by calculating the expected gross profit margin at the time of project initiation (baseline) and comparing it to the actual gross project profit margin at the time of project completion for each project in which risk management is carried out. Comparing these numbers with the results of the same measure taken on projects in which risk management is not carried out by project managers would provide a clearer picture of the risk management impact on profitability.

Having said that, the absence of a negative impact on the gross profitability of projects, even if risk management was only carried out systematically in some of them does hint at a likely correlation between risk management and improved profitability of projects.

6.1.2.9 Number of Risk Events in Reviewed Projects

In the eight projects that were discussed during the interviews—projects in which risk management was carried out from start to finish—total of 43 risks occurred. Of these 43

risks 25, or 58% of all the risks that occurred, were identified during the risk identification stage. Responses for these risks were planned by the project managers in advance and implemented when the risk trigger became apparent to project managers.

Eighteen risks, or 42% of all the occurred risks in the projects, occurred unexpectedly and did not have risk responses planned for them. A majority of them (eight, or 44% of all unexpected risks) occurred in one project, project 4. This was the largest project of all the projects discussed in the case study. Despite the large number of unexpected and total of risk events, the project objectives were still met, according to the project manager. During the interview, the project manager remarked that while some of the risk responses had to be modified slightly, having planned for risks and having had contingencies in place was what helped her carry out the project to completion successfully:

> If I was doing a different project without already having a backup team in place, without already having a contingency plan, it would have been a disaster. Don't know if I could have pulled it off [completed the project] (Participant 1).

The number of risk events that came up during the projects (planned and unexpected can serve as a baseline for studying correlation between the number of identified and planned for risk events, as well as unidentified risks and the overall risk management maturity. Presumably, as the risk management maturity level increases, more risk events will be predicted and managed effectively, and the number of unexpected events will decrease, although there will always be some unexpected events.

6.1.3 Discussion of Risk Management Training and Templates

Based on the feedback provided by the participants about the training during the interviews, the risk management training conducted with them prepared them to carry out systematic risk management in translation and localization projects. The participants also noted that they felt that the training improved their overall project management skills. They also found that having access to the training materials and the templates after the training was beneficial, since they were able to use the templates and could go back and review parts of the training relevant to questions they had when managing projects after the training.

According to the information that participants provided during the interviews, when not asked directly about the training, they felt empowered, more confident and effective when communicating with stakeholders, and better prepared when managing risk events in projects. Most expressed their interest in managing risks beyond the level of isolated projects, on the program and portfolio level. They also showed their desire to continue improving their skills.

During the interviews, participants commented that while they did not feel that additional training was necessary, they were interested in having a follow-up review session in which they could share their individual experiences in managing project risks. In addition, review of the data collected in this case study shows that while the participants felt satisfied overall with the training, the training had some weaknesses that could be improved upon.

First, as has been mentioned above, a review or even several review sessions could have been incorporated into the training at certain intervals during the risk management implementation.

Second, more practice was needed in describing the risks. As the review of the risks identified by participants and risk events that occurred in projects indicated (see Table 6.1), some of the participants struggled with the description of risks. One possible way to remedy this problem would be to provide participants with more opportunities to practice using risk metalanguage during the training. [14] In addition, some of the participants struggled to correctly identify the sources of risks, a problem that likely stemmed from inaccurate risk descriptions. Nevertheless, adding more opportunities to practice identifying sources of risks would be a necessary improvement to the training. Allowing participants to practice using metalanguage would likely to lead to the risks being described, and risk sources and impact of the identified risks determined more precisely. If the risks are not described accurately, or the sources are not determined correctly, project managers are less likely to develop appropriate and effective responses to the identified risks.

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[14] Hillson (2004) offers metalanguage to assist in describing threats and opportunities and separate them from their causes and effects. This metalanguage was presented to the participants during the training. The metalanguage formulas are as follows:
For threats: "As a result of <*definite cause*>, <*uncertain event*> may occur, which would lead to <*effect on objective(s)*>" (Hillson 2004, 73).
Definite cause here is something **known** about the project, for example, absence of previous version of user interface translation. Uncertain event is the risk itself. And effect on the objective or objectives is the impact that the risk event will/could have if it occurs.
For opportunities: "Because we have <*strength*>, we might be able to create/exploit <*opportunity*>, which would lead to <*benefit*>" (Hillson 2004, 75).

Third, some of the templates could be improved and clarified for the participants. Some of the participants stated that they felt overwhelmed using the risk register and risk management plan templates. While the risk register template would be difficult to simplify, since it contains minimal required information, such as risk descriptions, risk source, risk owner, etc., some steps could be taken to facilitate the implementation and use of this template. For example, more detailed guidance and more practice opportunities could be provided to participants. In retrospect, the naming of the risk sources on a more granular level (Risk Category) was flawed; and having two columns to describe risk sources was confusing. The two columns were created to allow for more accurate testing of the risk sources model. In reality, it might be simpler to keep only one column for risk sources and allow the project managers to identify and describe sources of risk on as granular level only as necessary for the purposes of analyzing risks they identify and developing responses. Other information categories, however, are fairly common in risk registers that are offered in the risk management literature and by the risk practitioners. (See for example Cooper et al. 2005 and Hillson 2009.)

Only two risk management plans were submitted by the participants. One risk management plan was created for a project with a budget of more than $50,000 and one language (project four). Another report was created for a project with a budget of less than $50,000 and one language (project three). While the size of project three did not require that the project manager create a risk management plan, according to pre-established guidelines, the project manager must have felt it was necessary to do so, or

one of the stakeholders requested it. Interestingly, project three did not have any unexpected risk events occur. The only two risk events that occurred in this project were identified in advance and had planned responses, which were implemented by the project manager.

The seven other projects reviewed in this study had a budget of less than $50,000 and involved fewer than five languages, so according to the guidelines developed for use of templates they did not qualify for creation of a stand-alone risk management plan, unless the plan was specifically requested by a stakeholder or the project manager felt it was necessary to create such a plan. Only one other project, project nine, qualified, but that project was already in progress at the time of risk management training, so a project management plan could not be created.

Only one risk status report was created in the nine reviewed projects. It was a report from project two. The participants did not have any questions about the content of the report during the training, risk management implementation or interviews. They also did not comment specifically on this template during the interviews. Since the template was very simple and required very little information, it is possible that the participants did not feel they needed to use it to communicate risk information to stakeholders. However, having simple templates does not solve a problem of stakeholder involvement. Following an established process to communicate risk information to stakeholders consistently can solve the problem. Considering that stakeholder involvement appears to be one of the weakest points in risk management maturity, better communication of risk

information to stakeholders needs to be encouraged, and preparation of risk reports is one tool that can assist project managers with that.

6.2 Summary of the Findings

6.2.1 Implementation of a Generic Project Risk Management Framework

The results of this research confirm that implementation of a generic project risk management framework or standard, such as that of the Project Management Institute can be successfully carried out in a specific industry if the following conditions are met:

- A strategy to implement risk management is developed. Such a strategy must take into consideration the characteristics, composition, and challenges of the industry, as well as the characteristics of typical projects in that industry.
- A set of tools that can assist project managers and facilitate the learning process for them must be selected. The selection of tools is driven by several considerations: the tools must facilitate the learning process and they must be adapted to the specific types of projects in which risks will be managed. Such tools would include a risk breakdown structure and risk documentation templates, among others.

Translation and localization projects are like projects in any other industry in the sense that they are temporary (i.e., they have a defined start and finish), they are unique, they are undertaken for the purpose of creating a defined product or result (i.e., a translated or localized version of a product) and they are executed under conditions of uncertainty. However, translation and localization projects present their own specific

characteristics and challenges. For example, these projects can be characterized as having short duration, small budgets and low visibility, since translation and localization are often perceived as an "add-on" feature or support element relative to the main product. Challenges of translation and localization projects lie in the reality that they are heavily outsourced, often exhibit a lengthy subcontracting chain and involve intangible "raw materials" and final outputs, namely language. These differences require that the process changes and new processes that are being introduced are tailored to accommodate the specifics of projects.

The case study conducted as part of this research suggests that the implementation of a tailored project risk management program presents several advantages:

- The project managers who participated in the case study felt prepared and more confident when managing risks in their projects during the implementation phase. In the eight projects conducted within the implementation period and discussed during the structured interviews, 58% of all risk events were anticipated and managed proactively. Presumably, the number of risk events that these project managers anticipate and successfully manage will increase as the project managers become more experienced in identifying risks, as they build a larger body of risk information upon which to draw when conducting risk identification and planning processes, and as they act on the additional recommendations offered later in this chapter.
- Gross project profit margins did not decrease after the risk management implementation. While it is not possible to conclusively demonstrate a correlation

between the risk management implementation and the 14.73% increase in gross project profit margins that occurred in the three months that followed RM training and implementation, it is clear that the intervention did not have a negative impact on profit margins.

- The implementation encouraged the participants to think beyond project-level risk management and to focus on the management of appropriate risks at a broader level, by operationally managing risks specific to certain clients, types of projects or specific languages.

6.2.2 Verifying the Model of Risk Sources

The participants in this study used the RBS provided to them. They added some categories if the category was not included in the RBS document or to introduce a higher level of granularity when determining the sources of risks they identified. Consequently, the RBS document was not used as a checklist, but rather as a reference document, exactly as it was intended.

6.2.3 Impact of Risk Management Implementation

Risk management training and implementation had a clearly visible effect on the risk management maturity level and project management practices at ABC Inc. The effect is evident when studying the levels of risk management maturity of the participants across the different perspectives. Apart from a small decrease in *Risk Identification*, *Risk Analysis* and *Project Management* perspectives seen in the results of the assessment of

participant 5, and in the *Stakeholders* perspective for participant 2, there was an increase across all perspectives for the remaining four participants. The decrease in the *Stakeholders* perspective for participant 2 was very small—only 7.56%. The information obtained through the interviews and the review of the project documentation confirms the results of the assessments and the positive effect of the training and risk management implementation.

The effect of the risk management implementation on the overall risk management maturity of the participants was primarily positive. The overall risk management maturity level increased for four out of five participants:

- Participant 4 showed the lowest increase in the overall risk management maturity (~50%), but her level still increased from *Naïve* to *Novice.* This participant was tested after a significantly shorter implementation period due to her leaving ABC Inc. during the implementation period.
- The level of participant 3 remained at *Naïve*, but a large increase of 551.73% over the original is visible in the results of the post-implementation assessment.
- The results of the assessment of participant 5 show a decrease in the overall risk management maturity level. However, participant 5 was not subject to the same level of intervention as the other participants:
    - She did not have general project management experience before taking the baseline assessment.

- She was new to ABC Inc., and therefore had to acquire a significant amount of knowledge of internal company processes beyond the domain of risk management (and even beyond the domain of project management).
- She underwent risk management training in conjunction with the general project management and company training upon joining ABC Inc.

For these reasons, the baseline level of participant 5 should have been *Naïve* across all perspectives.

The overall maturity levels of the participants as measured by the Risk Management Maturity assessment after the risk management implementation were as follows:

- Participant 1: *Natural*
- Participants 2 and 4: *Novice*
- Participants 3 and 5: *Naïve*

According to Hopkinson (2011), a project manager at the *Natural* level is effective in setting project objectives, identifying risks and managing risks systematically "within the context of a team culture conducive to optimizing project outcomes" (5). A shift from the *Normalized* to *Natural* level is the most challenging as it "includes management of risk from a project strategy perspective" (Hopkinson 2011, 6). Such a shift also has the power to alter project objectives and requires more sophisticated risk management techniques than, for example, the Probability-Impact Matrix (Hopkinson 2011, 6). Even though the Probability-Impact Matrix was the only risk analysis tool used

by participants during the implementation, the fact that participant 1 demonstrated a dramatic increase in maturity level (from *Naïve* to *Natural*) shows that the implementation of risk management in this project manager's practice has already demonstrated itself to be successful. Having said that, there are still areas open to improvement in this participant's practice.

The *Novice* level indicates that while project risk management influences the project manager and the project team, and while project performance is improved when measured against project objectives (Hopkinson 2011, 5), there are still weaknesses in the design or implementation of the risk management process, and so many benefits of risk management are not yet realized. It is the researcher's hope that implementation of the recommendations offered later in this chapter will lead to further improvements and will enable the participants to further benefit from project risk management for in the future.

The results of the risk management maturity assessments of both participants 3 and 5 reveal that they remained at the *Naïve* level after the implementation, which, according to Hopkinson, indicates that while the PRM process has been initiated, "its design or application is fundamentally flawed. At this level, it is likely that the process does not add value" (2011, 5). However, the interpretation of the results of each of these two participants requires careful consideration of the circumstances in which these results were obtained.

The low level of maturity of Participant 5 is most likely the result of insufficient opportunities to manage projects in general and to carry out risk management processes

in particular during the implementation period. Despite the additional time that elapsed between the initial risk management maturity level assessment and the post-implementation assessment (six months compared to ~4 months for the rest of the participants), participant 5 had other duties assigned to her during the implementation period, and these duties limited the number and the size of the projects assigned to her.

As for participant 3, while her risk management maturity level remained at *Naïve*, her overall risk management maturity level score increased from 3.75% to 24.44%, which constitutes an increase of 551.73%. Considering that 25% is the cut-off point for the next level (*Novice*), it is very likely that given more opportunities to carry out project risk management, the results of the post-implementation assessment would have shown a larger effect and that she would have progressed at least to the level of *Novice*. The participant herself remarked during the interview that she had not yet had a project in which the full potential and benefits of risk management could be explored, as most of the projects she had managed so far had not been very large.

6.2.4 Training and Tools

The results of the interviews and review of the project documentation demonstrate that the majority of the tools offered to the participants during the training, such as the RBS document, the Risk Management Plan, the Risk Register and the other RM templates, were useful to the participants.

Interviews, reviewed project documentation and the results of the risk management maturity assessment also indicate that the participants felt prepared to carry

out risk management in their projects. This finding provides further evidence suggesting that the training was successful.

However, some improvements can and should be made to both the training and the tools used in this case study. Recommendations for these improvements are presented in the remainder of this chapter.

6.3 Suggestions for Improvements to the Risk Management Program

Based on the analyses of the data collected in this case study, a number of recommendations is indicated for the improvement of the risk management training and risk management processes.

6.3.1 Recommendations for Training

The case study revealed that the risk management training provided could benefit from several improvements. Specifically, the following improvements to the templates and introduction of the templates to trainees are indicated:

- Risk Register template:
  - Columns E (*Risk Source*) and F (*Risk Category*) should be combined into one column named *Risk Category* to be consistent with the terminology used in the *PMBOK® Guide.*
  - The title of Column K should be changed from *Risk Strategy* to *Risk Response Type* and the title of Column L should be changed from *Strategy Description* to

Risk Response Description. Doing so will make the titles more consistent with the descriptions of these columns and reduce potential confusion.[15]

- Metalanguage for describing threats and opportunities should be included in the template to make it easy for project managers to review the metalanguage when documenting risk information in the register. This metalanguage could be presented on the title sheet of the Excel book, where the project information and document status information is captured.
- Certain hints that describe what should be captured in each column of the register should be made more explicit. For example, in the *Risk Owner* column the hint "Assign risk to an owner" should be changed to "Assign the risk to the person responsible for managing that risk throughout all of the processes." And in the *Risk Category* column the hint "Specify category to which risk belongs (see RBS for proposed categories)" should be changed to "Specify the definitive cause that could lead to a threat to the project or could create an opportunity in the project (see RBS for proposed categories)"

- Project Risk Management Plan template:
  - The *Risk Categories* section of the project risk management plan could be removed or replaced with the reference to the company's most current RBS document containing risk categories.

[15] Current hints for each column give proper descriptions ("Select the type of risk response strategy to be used should the risk occur" and "Provide description of the risk response strategy")

  - If and when quantitative methods of risk analysis are implemented, information about the quantitative method used for analysis should be included in the *Risk Analysis* section of the plan.

- After the templates have been introduced during the training and the risk management documents have been created for the sample training project, e.g., the project risk management plan and risk register), trainees need to be given time to practice creating these documents on their own. This could be accomplished by allowing the project managers to select a project they are managing at the moment and having them create the two above-mentioned documents for that project. A follow-up session would need to be conducted, during which the trainees could present their documents and receive feedback from their peers and from the trainer.
- In several cases, risks were inaccurately described and sources of risks were incorrectly determined by the participants in the case study. This suggests that trainees must be offered more opportunities to practice using risk management metalanguage when describing risks. Opportunities for such practice could be provided during the group discussion of the sample project, and again later, during the follow-up discussion of the individual projects selected by the trainees for practice in creating project risk management documents.

The training could benefit not only from improvements to the templates and to the way in which the templates are introduced and used during the training, but also from a follow-up risk management session several months after the implementation. Six to

twelve months after the initial training would be a good time to carry out such a follow-up session, because it would give the project managers time to manage risks in a few projects and allow for synthesis of the implementation results. This company-wide risk management review session would allow a greater amount of interaction between the project managers and reflection on the risk management processes, thus facilitating the development of participants' metacognitive awareness. For example:

- The project managers could share their experiences and techniques with each other. Such exchange would benefit the project managers by allowing them to review the knowledge they have already acquired, would contribute to accelerated learning, and suggest improvements to existing processes.
- The project managers could provide feedback to other staff, such as sales managers or production staff, about their involvement in risk management activities. Doing so would contribute to commitment of the sales and production staff to risk management efforts carried out by the project managers and would improve risk communication within the company.
- The non-project management staff, such as sales or production managers, could share their concerns regarding risk management and ask questions about risk management processes in general or about the ways in which specific risk management activities and processes were conducted in past projects. This information exchange would also contribute to improving risk management processes, for example risk identification or

risk response planning, and would improve how risk management information is shared in the company.

- All staff members could review the objectives and results of the project risk management implementation.
- The project managers or the company risk manager (if any) could further improve the risk management templates, guidelines, processes and procedures.
- Periodic sessions and audits similar to the training follow-up session described above should be conducted on at least an annual basis to ensure continuous company-wide commitment to conducting risk management and that risk management continues to be effective and is meeting the defined objectives. Annual reviews and audits are common in management. For example, an ISO-certified company must undergo and pass annual audits in order to maintain its certification. It is possible that after having held several risk reviews project managers may decide that reviews at a more or less frequent interval might be useful, in which case the review schedule can be adjusted.

6.3.2 Recommendations for Specific Risk Management Processes

Based on the results of this study, several recommendations can be offered to project managers to improve the effectiveness of specific project risk management processes.

- Risk Identification
  - Risks must be described more accurately. Presenting a metalanguage during the training and making it available to the project managers could help them to prepare more accurate risk descriptions.
  - Risk ownership should be assigned more precisely. Responsibility for managing each specific risk must be assigned to a single person (or in rare cases to several people) rather than to the company as a whole.
  - The sources of risks must be determined accurately: incorrect determination of what causes a risk can impede the development of an effective response to that risk.
  - Participants should proactively identify and manage opportunities in addition to risks. Participants did not do so in the projects that were discussed in the structured interviews. The value of identifying and proactively managing opportunities should not be underestimated for improving project outcomes and both threats and opportunities should be identified.
- Risk Analysis
  - The next logical step in improving risk management would be to introduce quantitative risk analysis for larger and more complex projects. However, before this can done, a project complexity scale must be developed to facilitate the identification of projects that would benefit from the application of quantitative risk analysis methods. In addition, it would be necessary to select the methods

themselves. Unfortunately, many quantitative methods are complex, and often require highly specialized training and/or specialized software (for example, decision tree analysis or Monte Carlo simulation). Finding, selecting and implementing appropriate methods of quantitative risk analysis would warrant a new research project.

- Risk Monitoring and Control
  - Tracking risks throughout the project is recommended, along with more consistent and detailed documentation of risk information. In the projects reviewed as part of this case study, participants did not comprehensively track or document all risks. The failure to track risks systematically undermines the effectiveness of the downstream risk management processes in projects in which risk management is undertaken. If a risk trigger is not noticed because it is not tracked, the planned response(s) will not be implemented. In such a case, even a potentially effective response is useless. Likewise, lack of documentation reduces the ability of the project managers and of the company to take advantage of the risk information in future projects.
  - Improving how risk information is communicated to stakeholders will contribute to stakeholder commitment to managing risks. Since during the implementation of risk management almost all participants found stakeholder buy-in to be a challenge, this area needs immediate improvement. Sharing of risk management

information across projects and between project managers can facilitate cross-company risk management efforts.

6.3.3 Other Recommendations

Several participants in this case study made suggestions for changes that could facilitate their work on specific projects. This section builds on these suggestions and offers additional ones.

First of all, some common risks can be managed at the level of the company rather than at the level of specific projects. Among such risks, as identified by one of the participants, is the availability of translators and editors for languages not frequently requested by the customers of ABC Inc. A dedicated vendor manager or a project manager with vendor management responsibility, or, if no such person is designated in the company, a project manager with the lightest work load, can be assigned temporary responsibility for widening the pool of human resources for less frequently requested languages.

Second, for repeat customers whose projects are very repetitive and do not exhibit high complexity, common risks can be identified and managed proactively across multiple projects, instead of on a project-by-project basis. One of the participants mentioned that carrying out systematic risk management for certain small, repetitive projects for a given customer introduces too much overhead. Managing common risks across multiple similar projects would reduce the overhead of risk management in each

particular project, but would still enable ABC Inc. to proactively address some of the risks that are typical of that customer's projects.

Third, typical risks could be identified in more complex and varied projects commissioned by repeat customers, once risks have been managed consistently in several such projects. Typical risks in such projects would likely consist of external risks caused by the customer and even some technical risks, for example risks associated with the technology used by the customer or with the customer's general quality requirements. However, this hypothesis would need to be confirmed in a separate research project. If typical risks are identified, they can be managed at the level of the individual customer, which would facilitate management of risks at the project level.

Fourth, improvements in documenting project-related information unrelated to risk management would also benefit risk management. For example, documenting the project requirements and scope at a more granular level of detail would provide a more solid foundation for identifying project requirements-related or project scope-related risks. It is particularly important to improve the identification of risks related to these knowledge areas (scope and requirements management), because both scope and requirements serve as the foundation for determining project objectives and parameters.

Finally, existing project risk management information can be offered to newly hired project managers or even to existing project managers who are taking over other project managers' customer accounts, whether on a temporary basis or permanently. This background information would allow the project managers to carry out risk identification

more effectively, to anticipate risks that they might not otherwise think of for lack of project management experience or lack of experience with that specific customer account, and would also allow new project managers to develop more effective risk responses, since they would have access to documentation concerning the relative effectiveness of various responses to specific risks in past projects.

6.4 Contributions of the Study

In this study a generic risk management framework was successfully applied for the management of translation and localization projects in the language industry. The generic framework chosen for the study was PMI's project risk management standard. The study was carried out in an organization with a low level of risk management maturity. The results of the study indicate that this implementation benefited both the organization and the participants.

The main contributions of this study with respect to the participant organization are summarized below.

- The implementation brought risk management processes, tools and techniques within the scope of language project managers' responsibilities and by doing so contributed to the overall maturity of project management processes within the company.
- Managing risks in projects required that project managers re-examine and reinforce related project management processes, such as communication management, scope management, time management and cost management, since the implemented framework implicitly required that project managers understand and apply general

project management principles. All of the project managers who participated in the study had undergone project management training that was based on the PMI's *PMBOK® Guide*.

- The program gave project managers an opportunity to create consistent risk management documentation about the projects in which risk management was carried out from start to finish. This risk management information can now be used by the company to facilitate on-the-job training for new project managers and interns, as well as serve as a tool for customer education.
- Finally, the implementation of systematic risk management empowered project managers to address risks proactively, rather than engage in reactive "fire-fighting" as risk events occur unexpectedly in the projects that they manage.

The RBS model developed for this dissertation and made available to project managers as one of the tools used in the case study could be expanded for language projects of other types, such as projects involving voice-over, subtitling, interpreting and other language-related services. And indeed, the participants in the study expressed a desire to see that happen.

This study has implications for the teaching of project management in academic and professional translation training programs. Among such implications is the importance of including risk management as one of the core project management areas of study. The challenge in teaching risk management, however, is that the lack of hands-on project management experience can undermine the learning experience in the classroom

and later the effectiveness of risk management processes that are carried out in projects outside of the classroom. Creating scaffolding by providing project management students or trainees with risk information from real-life projects, exposing them to a variety of project types (e.g., projects that involve various software, services and languages), and providing them with risk breakdown structures specific to different language companies and other tools would increase the likelihood of success for these students and trainees when they manage risks in real-world projects.

This study also has implications for language companies implementing risk management. Although primary responsibility for risk management in language companies will likely lie with project managers, others in the organization must change as well in order to foster the success of risk management implementation. Sales staff, production staff, company management, and subcontractors are ultimately stakeholders who can either facilitate or complicate the lives of project managers who are attempting to manage risks systematically. Similarly, clients and buyers of language services hold both a stake in and a key to the success of language projects, so communicating risk information and educating them about the benefits of risk management cannot and should not be overlooked by project managers and their colleagues who have direct contact with customers.

Finally, this study has implications for language professionals. All translators, interpreters, voice talent, terminologists, localization engineers and others engaged in language projects are operating within a project-driven, digital and heavily outsourced

industry. They work in projects that are typically of short duration, have small budgets, and operate with abstract material, such as language. But more importantly, they engage in *projects*, which are undertaken under conditions of uncertainty. Any knowledge, skill and efforts that these professionals can bring to the table when contributing to, and actively participating in, the management of risks in language projects will enhance the value of the very service that they provide. Language companies and professionals often struggle to differentiate themselves from the competition in the marketplace. Customers that outsource language services to them implicitly outsource the management of risks in language projects. However, few language providers realize that they must manage risks and that doing that can be that key differentiator for them in the marketplace.

6.5 Limitations of the Study

This research project consists of a case study. One of the limitations of case studies is that their results cannot be generalized to the population. However, the purpose of this research was not to find generalizable results, but to test a narrowly adapted approach in a specific context.

The model of risk sources tested in this research had its limitations. Its focus was limited to sources of translation risks in order to keep the model and the study manageable. However, the information processing model (input → process → output), which is the foundation of the model of translation risk sources, can be used for other tasks that are carried out in language projects, such as interpreting, desktop publishing,

localization engineering, terminology and others. This limitation is therefore also a possible avenue of future research and will be discussed as such later in this chapter.

This study revealed several limitations related to measurements and procedures. First, in an ideal world, all participants would have undergone all measurement procedures on the same timeline. However, the challenges of carrying out a case study in a real-world (as opposed to experimental) context and in a real-world company is that the researcher had to adjust to constraints and limitations imposed by the context and the company, such as time (the schedule had to be adjusted because of participants' vacations and workload), new hires and employee departures (events that are extremely common in small companies in the language industry).

Second, it seems in retrospect that the time allocated for the implementation of risk management and data collection was too short. The decision to conduct the implementation over a three-month period was motivated by the fact that this research had to be completed within a reasonable timeline. In order to truly understand the impact of risk management, larger and more complex projects would have been managed by participants. However, waiting for all participants to have managed several large complex projects from start to finish could take longer than three months for several reasons:

- Companies rarely get to choose which projects to take on. Depending on fluctuations in demand, customers simply may not request large complex projects during the implementation period.
- Not all project managers may be authorized to take on larger, complex projects.

- Even if a given project manager is qualified and authorized to manage a large complex project, s/he may not be available to take on such a project when the company lands one.
- A large, complex project is more likely to experience schedule delays and modifications, as well as a longer-than-expected closing cycle, making it likely that the actual schedule duration will be longer than what is initially planned and approved.

In this case study, only three out of eight projects that were initiated and completed during the implementation period had a budget of more than $20,000 and only one project involved more than two languages. While the impact of systematic project risk management is apparent in the results of the measurements and procedures carried out in this case study, allowing more time for implementation would likely provide a clearer picture and provide stronger evidence of the effect.

Third, developing and taking more precise measurements associated with profit margins would allow the researcher to assess whether a correlation exists between the implementation of systematic project risk management and increased profit margins.

A final limitation associated with measurements is the fact that it was not possible to track on-time project delivery in the current company management system used by ABC Inc., although this measure was a part of the original design. Since risk events frequently impact the project schedule, on-time delivery would have been an excellent

measure to use when determining the impact of implementing systematic project risk management.

During the risk management training carried out as part of this case study, participants requested that modified risk management training be conducted with the sales staff. This training was prepared and conducted shortly after the training of the participants. However, no assessments or procedures were carried out with the sales staff, because this training (and therefore any measurements and procedures related to it) was outside of scope of the original research plan.

6.6 Future Research Directions

One of the questions that was on my mind while writing this dissertation was whether "opportunity" should be included in the definition of risk, as some project management organizations and practitioners are currently suggesting. Identifying and managing opportunities together with threats is undoubtedly important and many scholars and practitioners working in risk management agree with this development. However, the term "risk" has historically had negative connotations in general usage and in many domains, such as engineering, medicine/healthcare, defense and others. The historical baggage that the word "risk" will be unlikely forgotten with a prescriptive approach and push to changing the definition of "risk". Having said that, bundling opportunity management and risk management together and developing techniques that assist project managers in adopting a unified approach to both threats and opportunities is important. One potential direction of research would be to conduct a survey across multiple

industries to find whether companies are engaging in opportunity management as part of risk management (that is, treating opportunity as a facet of risk), or if they are conducting opportunity management alongside risk management, thereby separating opportunity from risk and retaining the historically negative connotation of the term "risk."

The findings, conclusions and limitations of this case study suggest several future avenues of research. One would be to analyze the results of the case study taking into account the years of experience of the project managers to see whether there is a correlation between years of experience and the effect of the implementation of systematic risk management.

The number of risk events that occurred in the projects discussed in this case study could serve as a baseline for a future study of correlation of identified versus unexpected risk events that occur in projects and the overall risk management maturity level of the project manager or the company. Presumably, as the overall risk management maturity level of the project managers increases, they will become more effective at identifying, planning for and responding to risks, so fewer unexpected risk events should occur and more of the risk events that do occur should be identified and managed proactively.

Another extension of this case study would be to prepare a follow-up report based on this case study and present it to ABC Inc. The report could include recommendations for improvement, as well as revisions to templates and other risk management materials based on the results and conclusions of this dissertation. Presenting this report and

conducting a follow-up session with the ABC Inc.'s project managers would allow them to reflect on their experience throughout the training and implementation, as well as to share their experience and their suggestions for further improvement of risk management training and practice. While such a follow-up is not part of the study per se, it was requested by most participants during the interviews and ideally should be carried out. Process-based approaches to management are founded on the notions of continual improvement and feedback loops. Thus, it is likely that such a follow-up would contribute to further improvement of risk management practices in ABC Inc.

Yet another way to develop and build on this case study would be to further develop the model of risk sources by basing it on project typologies and corresponding risk typologies. For example, project types might include (a) translation of FrameMaker files; (b) translation of MadCap Flare files; (c) translation of RESX files; and (d) hybrid MT-human translation projects; to cite but four possibilities. These types could be further divided into sub-types, such as Western European languages, Asian languages, bi-directional languages, Indic/Unicode-only languages, and so on. Creation of project typologies would provide the foundation for development of typologies of risks common to the types of projects. These risk typologies can be created in a form of risk breakdown structure (RBS) documents. The existence of such RBS documents would facilitate risk identification process and would allow project managers to identify more of relevant risks. Such RBS documents would be even more valuable for less experienced project managers, who might not necessary think of certain risks otherwise.

One of the limitations of this case study was the introduction of only qualitative risk analysis techniques to reduce the complexity of the risk management process and to facilitate the project managers' transition from a project management process that included no risk management to one that included systematic risk management. The selection and introduction of quantitative methods of risk analysis would be the next logical step in raising the risk management maturity level at ABC Inc. This step presents two main challenges. First, it would be necessary to develop a scale to determine the project size and complexity thresholds beyond which it is cost-effective to employ quantitative methods. The second challenge is time. Projects would have to be larger and more complex than those discussed in the current case study to justify the implementation of quantitative methods of risk analysis. Since demand in the language industry is characterized by peaks and troughs and is impossible to predict, carrying out a sufficient number of large and complex projects and gathering the necessary data on use of quantitative risk management techniques would likely require much longer than three months, and might even take several years.

Finally, this case study could be replicated in a different translation or localization company. Conducting risk management training and risk management implementation in a different company might offer additional insights into the ways in which risk management training and processes might be further improved, and would allow the researcher to further test and improve the model of risk sources.

APPENDIX A. POST-IMPLEMENTATION INTERVIEW PROTOCOL

Structured interviews were carried out with project managers about the projects closed in the past three months and in which risk management was performed to identify the number and the nature of risk events that arose during these projects, as well as to solicit feedback about risk management program training and implementation. The same interview protocol will be carried out for all identified projects. Descriptions of the projects will not be requested during the interviews but instead will be taken directly from the company management system.

Let's talk about project ID#___. You can refer to project information captured in [the company management system] or in your project documentation as needed. I will first ask you about risk events that arose during this project. Specifically, were there any risk events associated with the following aspects of the project:

1. *Were there any risk events caused by some aspect associated with source materials, such as:*
    - *The text itself*
    - *Its context (business or pragmatic context)?*
2. *Were there any risk events caused by the translation process, such as:*
    - *How translators approached the task*
    - *Translators' cognitive abilities (ability to learn, problem-solving, etc.)*

- *Project-specific processes*
- *Translator knowledge?*

3. *Were there any risk events associated with the output (final product)*
    - *How the output was perceived/responded to?*
    - *How the product/output was used or reused?*
4. *Were there any risk events that were triggered during the project, but that you have not yet mentioned? If so, what were they?*
5. *Were any of the risk events that arose during the project identified during the risk identification stage? What were they?*
6. *Did these risk events have responses planned? Why/why not?*
7. *Were the responses implemented as planned? Why/why not?*
8. *Were the responses effective? Why/why not?*
9. *For those risk events that did not have responses planned,*
    - *What was the impact on the project?*
    - *How were these risk events addressed if at all?*
10. *Is there something you would have done differently in the project if you knew what you know now, having completed this project?*
11. *What lessons did you learn as a project manager from this project?*
12. *In your opinion, was the project successful? Why/why not?*
13. *In your opinion, did the customer consider the project a success? Why/why not?*
14. *Is there anything else you want to add about this project?*

And now a few questions about the Risk Management approach:

15. *In your opinion, was there any difference between this project, in which risks were managed systematically, and projects in which risk management processes were not carried out? If yes, please explain.*
16. *Do you have any feedback about any of the risk management templates used in this project?*
17. *Do you have any feedback about the risk management processes as they were applied in this project?*
18. *Was there anything that you would like to do differently next time managing risks?*

Finally, I want to ask you about the risk management training that you received:

19. *Did the training prepare you carry out risk management in translation project? If no or not quite, what processes did you feel unprepared to carry out?*
20. *Did you change how you manage projects as a result of the training?*
    - *If yes, what were the changes?*
    - *If no, why not? Were there obstacles to the change?*
21. *Did the training improve your skills as a project manager? If yes, how?*
22. *Do you feel like additional training is warranted/will be helpful? If yes, in which area or areas?*

APPENDIX B. RISK BREAKDOWN STRUCTURE DOCUMENT

1. Task-level sources of risk: Translation
    a. Input: source materials
        i. Text
            1. Factual accuracy
            2. Author's writing skills
            3. Language validity
            4. Cultural boundedness
        ii. Context
            1. Business context
            2. Pragmatic context
                a. Accessibility
                b. Availability
    b. Translation process
        i. Translator cognitive processes
            1. Memory
            2. Problem-solving
            3. Learning
        ii. Translator's approach
        iii. Project-specific processes
        iv. Translator knowledge
            1. Technical/tools knowledge
            2. Business knowledge
            3. General knowledge
            4. Language knowledge
            5. Cultural knowledge
            6. Translation experience
            7. Subject-matter expertise
    c. Output: translation
        i. Reuse
        ii. Reader response
            1. Sponsor response
            2. Reviewer response
            3. End-user response
2. PM-level

- a. Estimating
    - i. Scope
    - ii. Cost
    - iii. Time/schedule
- b. Planning
    - i. Scope
    - ii. Cost
    - iii. Time/schedule
    - iv. Risk
    - v. Communications
    - vi. Quality
    - vii. Resources
- c. Controlling
    - i. Scope
    - ii. Cost
    - iii. Time/schedule
    - iv. Risk
    - v. Communications
    - vi. Quality
    - vii. Resources
- d. Communication
    - i. Channels
    - ii. Reliability
    - iii. Security
    - iv. Project knowledge management
- e. Inadequate PM
- f. Lack of PM knowledge/experience

3. Organizational level
    - a. Resources
        - i. Financial
            1. Funding
            2. Cash flow
        - ii. Human
            1. Staff changes
            2. Staff availability
            3. Staff skills/expertise/training
        - iii. Material
    - b. Prioritization and coordination
        - i. Business goals and objectives
        - ii. Project dependencies

iii. Resources

c. Management
    i. Inappropriate or lack of organization structure
    ii. Appropriate policies and procedures (lack of, absence of, correctness)
    iii. Loss of control
    iv. Incapacity
    v. Cross-company knowledge management

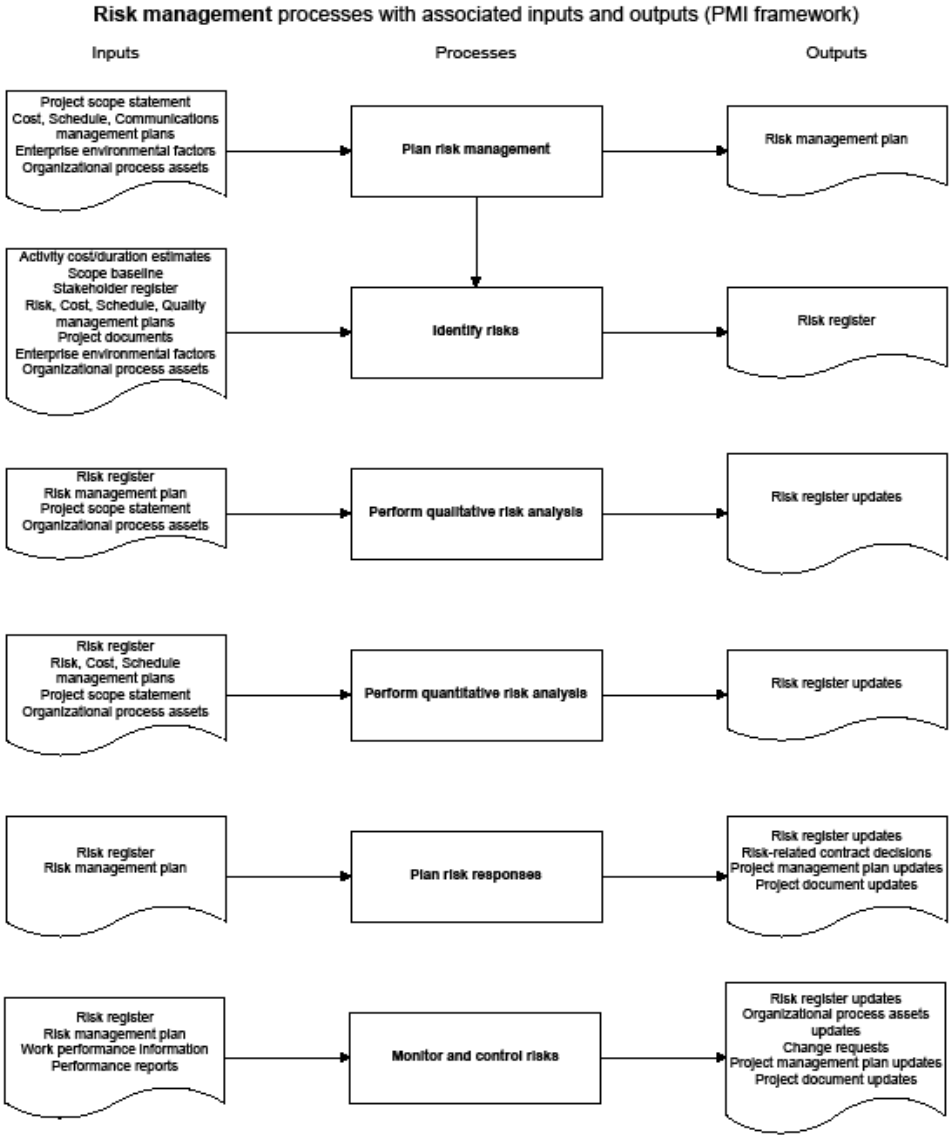
4. External
    a. Subcontractors and suppliers
        i. Ability to delivery skills/quality/equipment
        ii. Accreditation
        iii. Alternative suppliers/sub-contractors
        iv. Availability
        v. Cost of services
        vi. Lead times
        vii. Reliability of suppliers
        viii. Timeliness
        ix. Warranty of services
        x. Prompt payment
    b. Regulatory and legal
        i. Changes to standard general conditions
        ii. Contractor to inform him/herself
        iii. Insurance
        iv. Warranties
        v. Unfamiliar legal environment
        vi. Requirements specification
        vii. Quality specification
        viii. Licenses/rights
    c. Market
        i. Inflation rate
        ii. Interest rate
        iii. Exchange rate
        iv. Taxation effect
        v. Competitive pressures
        vi. Market growth/share
        vii. Innovation
    d. Customer
        i. Ability to meet contract commitments, including ability to pay
        ii. Customer business failure
        iii. Customer change of ownership

iv. Customer inability to take delivery f project
v. Customer misunderstanding of needs, scope, schedule, quality requirements
vi. Customer speed of response
vii. Customer culture and attitude

e. Weather
f. Force majeure
i. War
ii. Strike
iii. Riot
iv. Acts of God, e.g. flood, earthquake, volcanic eruption, etc.
v. Health, e.g. disease, death, injury
g. Culture
i. General culture: customs, traditions, etc.
ii. Language
iii. Business culture
iv. Quality culture
v. Time difference and work hours
vi. Holidays

5. Technical
a. Requirements
i. Understanding of user/customer/reviewer expectations
ii. Requirements identification
iii. Detail of specification
iv. Different expectations on the part of customer/reviewer/user
b. Technology
i. Cost
ii. Maintenance
iii. Training
iv. Technological change
v. Technology not available
c. Complexity and interfaces
d. Performances and reliability
e. Quality

APPENDIX C. RISK MANAGEMENT PROCESS DOCUMENT



APPENDIX D. IRB DOCUMENTATION: INFORMED CONSENT AND APPROVAL

Appendix B2

Kent State University
Institutional Review Board

Informed Consent to Participate in a Research Study

Study Title: Project Risk Management: Developing a Risk Framework for Translation Projects

Principal Investigator: *Elena Dunne*

You are being invited to participate in a research study. This consent form will provide you with information on the research project, what you will need to do, and the associated risks and benefits of the research. Your participation is voluntary. Your employer has given permission to the principle investigator to access company data, conduct training and interviews as part of this research project. Your employer has also given permission for you to participate in this project. Please read this form carefully. It is important that you ask questions and fully understand the research in order to make an informed decision. You will receive a copy of this document to take with you.

Purpose: *The purpose of the study is to develop a risk management model for implementation in translation project management contexts. The efficacy of the risk model will be evaluated after implementation in actual translation projects carried out by a translation company.*

Procedures

The study will involve the following:

1) *Developing a risk management model for translation projects*
2) *Obtaining pre-implementation project performance metrics (from company data) and measures of the current level of risk management maturity in the company (via survey and structured interviews)*
3) *Training on risk management in general and the proposed risk model in particular*
4) *Implementing the proposed risk management model (two-months period)*
5) *Obtaining post-implementation project performance metrics (from company data) and measures of the current level of risk management maturity in the company (via structure interviews)*

Participants will be involved in steps 2, 3, 4 and 5 described above. Step 2 will involve risk management maturity assessment. Training on risk management (step 3) will take 6 hours. Implementation of the proposed risk management model will be for two months during which participants will be able to apply and implement knowledge and skills learned during the training in their day-to-day work (principal investigator will be available for consultations, but no data will be gathered during this period). After the implementation, in step 5, participants will be interviewed and another risk management maturity assessment will be performed (estimated time 4-6 hours).

Participants will not be asked any health-related, demographic, or any other personal questions. Questions asked in surveys and during the interviews will focus on project management duties participants normally perform at the company and on risk management model training and implementation.

No personal records or written materials will be collected; only information provided by participants in the company business management system and as part of standard project documentation will be collected and analyzed.

Expected duration of the training is 6 hours; introduced risk management processes will be implemented immediately following the training and the implementation will last approximately 2 months, during which the researcher will be availability for training follow-up consultations. Upon completion of the implementation, interviews will be conducted with the participants.

Audio and Video Recording and Photography

Interviews will be recorded, transcribed, and analyzed. The recorded tapes or videos will be used only by the principal researcher and will not be used for any other purposes outside the scope of this research. Only transcripts of the recordings will be used in the analysis and only aggregate results and random quotes will be used in the research presentation materials. Participants will not be identified in any way in the presentation of the research materials or results. A separate consent form for the use of audio/video recording by the principle investigator is provided to you.

Benefits

Participation in the research study will benefit the participants directly by allowing them to acquire new risk management skills and better understand how risk management can be integrated into general project management (due to the training component of the study). There may be direct benefits to the project managers in that the risk model may improve the probability of project success and create a more robust project management framework for the company. In addition, participation will provide the opportunity to contribute to the advancement of knowledge and research in translation studies, project management and risk management.

Risks and Discomforts

The anticipated risks involved in this study are negligible and do not go beyond risks encountered in everyday life. As this study is not experimental research, there is no possibility of bodily injury to you. Adequate measures have been taken to protect your identity and the identity of the agency in which you work. These points are further explained in the next section.

Privacy and Confidentiality

All study-related information will be kept confidential within the limits of the law. The identity of participants and field site in this study will ***not*** *be disclosed. Pseudonyms will be used instead in reporting all data. Data containing identifiable information will be kept private and will be accessible only to the principal investigator. Any identifying information including signed consent forms will be kept in a secure location, and only the researcher will have access to the data. Research participants will not be identified in any publication or*

presentation of research results. Location of the field site will be known to the dissertation advisor and the dissertation committee members, however, the field site will be referred to as "Translation Company" in the study itself or its presentation.

Compensation

Participants in this study will not receive financial compensation for this study. Other benefits of the study are discussed under benefits.

Voluntary Participation

Taking part in this research study is entirely up to you. You may choose not to participate or you may discontinue your participation at any time without penalty or loss of benefits to you. You will be informed of any new, relevant information that may affect your health, welfare, or willingness to continue your study participation.

Contact Information

If you have any questions or concerns about this research, you may contact Elena Dunne, the Principal Investigator at 330-688-1191 or Dr. Gregory Shreve, the Project Advisor at 330-672-2150. This project has been approved by the Kent State University Institutional Review Board (IRB). If you have any questions about your rights as a research participant or complaints about the research, you may call the IRB at 330-672-2704.

Consent Statement and Signature

I have read this consent form and have had the opportunity to have my questions answered to my satisfaction. I voluntarily agree to participate in this study. I understand that a copy of this consent will be provided to me for future reference.

_____ _____

Participant Signature **Date**

KENT STATE UNIVERSITY INSTITUTIONAL REVIEW BOARD "APPROVED" JAN 25 2012 to JAN 24 2013

Appendix C

AUDIOTAPE/VIDEO CONSENT FORM

Study Title: Project Risk Management: Developing a Risk Framework for Translation Projects

Principal Investigator: *Elena Dunne*

I agree to participate in an audio-taped/video-taped interview about risks encountered in projects as part of this project and for the purposes of data analysis. I agree that Elena Dunne may audio-tape/video tape this interview. The date, time and place of the interview will be mutually agreed upon.

_____

Signature Date

I have been told that I have the right to listen to the recording of the interview before it is used. I have decided that I:

____want to listen to the recording ____do not want to listen to the recording

Sign now below if you do not want to listen to the recording. If you want to listen to the recording, you will be asked to sign after listening to them.

Elena Dunne may / may not (circle one) use the audio-tapes/video tapes made of me. The original tapes or copies may be used for:

____this research project _____publication _____presentation at professional meetings

_____

Signature Date

Address:

APPENDIX E. IRB DOCUMENTATION: INFORMED CONSENT AND APPROVAL RENEWAL

CELEBRATE CENTENNIAL
KENT STATE
1910-2010

Appendix B2

Kent State University
Institutional Review Board

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Study Title: Project Risk Management: Developing a Risk Framework for Translation Projects

Principal Investigator: *Elena Dunne*

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4) *Implementing the proposed risk management model (two-months period)*
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Participants will be involved in steps 2, 3, 4 and 5 described above. Step 2 will involve risk management maturity assessment. Training on risk management (step 3) will take 6 hours. Implementation of the proposed risk management model will be for two months during which participants will be able to apply and implement knowledge and skills learned during the training in their day-to-day work (principal investigator will be available for consultations, but no data will be gathered during this period). After the implementation, in step 5, participants will be interviewed and another risk management maturity assessment will be performed (estimated time 4-6 hours).

Participants will not be asked any health-related, demographic, or any other personal questions. Questions asked in surveys and during the interviews will focus on project management duties participants normally perform at the company and on risk management model training and implementation.

No personal records or written materials will be collected; only information provided by participants in the company business management system and as part of standard project documentation will be collected and analyzed.

Expected duration of the training is 6 hours; introduced risk management processes will be implemented immediately following the training and the implementation will last approximately 2 months, during which the researcher will be availability for training follow-up consultations. Upon completion of the implementation, interviews will be conducted with the participants.

Audio and Video Recording and Photography

Interviews will be recorded, transcribed, and analyzed. The recorded tapes or videos will be used only by the principal researcher and will not be used for any other purposes outside the scope of this research. Only transcripts of the recordings will be used in the analysis and only aggregate results and random quotes will be used in the research presentation materials. Participants will not be identified in any way in the presentation of the research materials or results. A separate consent form for the use of audio/video recording by the principle investigator is provided to you.

Benefits

Participation in the research study will benefit the participants directly by allowing them to acquire new risk management skills and better understand how risk management can be integrated into general project management (due to the training component of the study). There may be direct benefits to the project managers in that the risk model may improve the probability of project success and create a more robust project management framework for the company. In addition, participation will provide the opportunity to contribute to the advancement of knowledge and research in translation studies, project management and risk management.

Risks and Discomforts

The anticipated risks involved in this study are negligible and do not go beyond risks encountered in everyday life. As this study is not experimental research, there is no possibility of bodily injury to you. Adequate measures have been taken to protect your identity and the identity of the agency in which you work. These points are further explained in the next section.

Privacy and Confidentiality

All study-related information will be kept confidential within the limits of the law. The identity of participants and field site in this study will ***not*** *be disclosed. Pseudonyms will be used instead in reporting all data. Data containing identifiable information will be kept private and will be accessible only to the principal investigator. Any identifying information including signed consent forms will be kept in a secure location, and only the researcher will have access to the data. Research participants will not be identified in any publication or*

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presentation of research results. Location of the field site will be known to the dissertation advisor and the dissertation committee members, however, the field site will be referred to as "Translation Company" in the study itself or its presentation.

Compensation

Participants in this study will not receive financial compensation for this study. Other benefits of the study are discussed under benefits.

Voluntary Participation

Taking part in this research study is entirely up to you. You may choose not to participate or you may discontinue your participation at any time without penalty or loss of benefits to you. You will be informed of any new, relevant information that may affect your health, welfare, or willingness to continue your study participation.

Contact Information

If you have any questions or concerns about this research, you may contact Elena Dunne, the Principal Investigator at 330-688-1191 or Dr. Gregory Shreve, the Project Advisor at 330-672-2150. This project has been approved by the Kent State University Institutional Review Board (IRB). If you have any questions about your rights as a research participant or complaints about the research, you may call the IRB at 330-672-2704.

Consent Statement and Signature

I have read this consent form and have had the opportunity to have my questions answered to my satisfaction. I voluntarily agree to participate in this study. I understand that a copy of this consent will be provided to me for future reference.

_____ _____

Participant Signature **Date**

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Appendix C

AUDIOTAPE/VIDEO CONSENT FORM

Study Title: Project Risk Management: Developing a Risk Framework for Translation Projects

Principal Investigator: *Elena Dunne*

I agree to participate in an audio-taped/video-taped interview about risks encountered in projects as part of this project and for the purposes of data analysis. I agree that Elena Dunne may audio-tape/video tape this interview. The date, time and place of the interview will be mutually agreed upon.

_____

Signature Date

I have been told that I have the right to listen to the recording of the interview before it is used. I have decided that I:

____want to listen to the recording ____do not want to listen to the recording

Sign now below if you do not want to listen to the recording. If you want to listen to the recording, you will be asked to sign after listening to them.

Elena Dunne may / may not (circle one) use the audio-tapes/video tapes made of me. The original tapes or copies may be used for:

____this research project _____publication _____presentation at professional meetings

_____

Signature Date

Address:

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