摘要

随着社会信息化进程的加速，翻译技术在翻译实践中的重要性日益突出，因此翻译技术成为译学的一个重要研究领域、译者能力的一个核心要素和翻译教学中不可或缺的内容；对此中外翻译研究者已有共识。但是由于翻译技术的跨学科性质，因此罕有中国译学学者研究翻译技术，而翻译技术教学的研究就更少了。当前（2008年）尚无一本公开出版的、由中国译者为中国译者而写的翻译技术专著或教程。而这正是本文写作意图之所在——探索翻译技术的理念与范围，并由此架起翻译技术与翻译教学之间的桥梁。

众所周知，译者关注翻译质量；而在高度商业化的今天，职业译者还关注翻译效率。翻译技术有助于提高翻译的质量和效率，因此日益受到翻译活动的各参与方的青睐。换言之，当前翻译市场对译者素质的要求除了传统的语言水平、翻译技巧、一般知识与专业知识之外还有使用翻译技术的能力。但是当前中国翻译技术教学的状况不容乐观：大多数翻译课程计划无翻译技术的内容，大多数外语学院的毕业生不具备使用翻译电子工具的能力，不能满足翻译市场人才需求。因此当前中国翻译市场人才需求与翻译教学之间存在较大的矛盾。而解决这一矛盾的尝试之一就是将翻译技术系统的整合到现有的翻译教学之中——即本文研究的课题。

本文共分五章。第一章为概论，阐述研究的必要性和目的，并描述论文结构。第二章为文献综述。首先评述以往翻译教学内容和方法方面的研究，而后在此基础上提出：当前应该将翻译技术作为一项新的内容整合到现有的翻译教学内容之中，而任务教学法可能是教授翻译技术的理想方法；后半部分则简要回顾以往翻译技术和任务教学法方面的研究，重点关注翻译技术的理念、范围、分类和任务教学法的本质。第三章研究主要翻译电子工具（即翻译记忆系统）与翻译教学的整合。首先简略介绍目前市场上流行的主要翻译记忆软件套装和使用翻译记忆系统的典型翻译流程；而后演示具有代表性的翻译记忆软件套装 Trados 的各组件在翻译前、翻译中、翻译后的使用方法；最后较为详细的讨论翻译记忆系统教学的方法与实施。第四章研究其他翻译电子工具与翻译教学的整合。首先概述其他翻译电子工具，而后具体演示各种翻译电子工具（机器翻译系统、电子词典、电子百科全书、语料库和搜索引擎）的使用方法，最后简略讨论这些翻译电子工具教学的方法与实施。第五章为结语，总结本文的主要内容，讨论本研究的主要不足并由此提出对未来相关研究的建议。

关键词： 翻译技术；翻译教学；译者的电子工具；任务教学法；翻译记忆

Abstract

With the acceleration of social informationization, translation technology plays an increasingly important role in translation practice, and thus it becomes an important research field in translation studies, a key element of translator competence, and an essential part in translation teaching, on which the translation researchers both at home and abroad have reached a consensus. But due to the cross-disciplinary nature of translation technology, researches on translation technology conducted by Chinese scholars of translation studies are rare, and researches on translation technology teaching are even less. At present we cannot find published monographs or textbooks on translation technology written by Chinese translators for Chinese translators. And this is exactly what this thesis is intended to do – exploring the principles and scope of translation technology and thus linking translation technology with translation teaching.

Translators focus on translation quality; professional translators are also concerned with translation efficiency in today's highly commercialized society. And translation technology can help improve both translation quality and efficiency, so it is increasingly popular with all parties involved in translation activities such as translators, translation companies, and clients of translation services. In other words, the current translation market requires translators to possess the ability to use translation technologies besides the traditional requirements like language proficiency, translation skills, and specialized knowledge. But the current situation of translation technology teaching in China is unsatisfactory: most translation programs ignore the existence of translation technology and graduates of most colleges of foreign languages do not have the ability to use translation technologies and thus can not meet the requirements of the current translation market. So there is a contradiction between the current Chinese translation market needs for translators and the current translation teaching in Chinese colleges. One tentative solution is integrating translation technology into the existing translation teaching systematically – the topic of the thesis.

The thesis consists of five chapters. Chapter One is the introduction to the thesis. It discusses the need for the study, describes the purpose of the study, and presents an overview of the thesis structure. Chapter Two is the literature review. It starts with the review on the previous studies on translation teaching contents and methods, and on the basis of the review it is proposed that it is time to integrate translation technology into translation teaching as a new content and that task-based learning may serve as the ideal method for teaching translation technology. And then the previous studies on the new content and the new method

are reviewed, which focuses on the principles and typologies of translation technology and the nature of task-based learning. Chapter Three studies the integration of the major electronic translation tools (translation memory systems) into translation teaching. It starts with a brief introduction to the major translation memory suites currently available on the market and the typical workflow of using translation memory systems, then demonstrates the usage of the various components of the Trados suite (a representative translation memory suite) in the phases of before-translation, during-translation, and after-translation, and finally the guidelines on teaching translation memory systems are discussed in detail. Chapter Four studies the integration of the minor electronic translation tools into translation teaching. It first presents a general introduction to the minor electronic tools for translators, and then demonstrates the usage of these tools – machine translation, electronic dictionaries, electronic encyclopedias, corpora, and search engines respectively, and in the last section the guidelines on teaching these electronic translation tools are discussed briefly. And Chapter Five is the conclusion of the thesis. It summarizes the major points of the thesis, discusses the limitations of the study, and presents the suggestions for future studies.

Key Words: translation technology; translation teaching; electronic tools for translators; task-based learning; translation memory

List of Tables and Figures

东南大学学位论文独创性声明

本人声明所呈交的学位论文是我个人在导师指导下进行的研究工作及取得的研究成果。尽我所知，除了文中特别加以标注和致谢的地方外，论文中不包含其他人已经发表或撰写过的研究成果，也不包含为获得东南大学或其它教育机构的学位或证书而使用过的材料。与我一同工作的同志对本研究所做的任何贡献均已在论文中作了明确的说明并表示了谢意。

研究生签名：_____日期：_____

东南大学学位论文使用授权声明

东南大学、中国科学技术信息研究所、国家图书馆有权保留本人所送交学位论文的复印件和电子文档，可以采用影印、缩印或其他复制手段保存论文。本人电子文档的内容和纸质论文的内容相一致。除在保密期内的保密论文外，允许论文被查阅和借阅，可以公布（包括以电子信息形式刊登）论文的全部内容或中、英文摘要等部分内容。论文的公布（包括以电子信息形式刊登）授权东南大学研究生院办理。

研究生签名：_____导师签名：_____日期：_____

Chapter 1. Introduction

This chapter consists of three sections. Section one discusses the need for the study, which also serves as an introduction to the social background of the study. Section two describes the purpose of the study. And section three presents an overview of the thesis structure.

1.1 Need for the Study

This section examines the contradiction between social informationization, the current Chinese translation market needs for translators and the current translation teaching in Chinese colleges, and proposes that integrating translation technology into the existing translation teaching systematically should be a feasible solution, and thus the need for the study is revealed.

1.1.1 Social Background

The global demand for translation has been growing rapidly under the influence of globalization, informationization, networking, and information explosion. The survey carried out by authoritative international organizations indicates: the size of global translation market is 1.04 billion dollars in 1999, 17.2 billion dollars in 2003, and 22.7 billion dollars in 2005 (Feng, 2006). And according to Mr. Huang Youyi – the vice-President of Translators Association of China, the output value of Chinese translation market is 11 billion yuan, and hopefully, it will exceed 20 billion yuan in 2005 (Xinhuanet, 2005). It is no doubt that the demand for translation both at home and abroad will continue to grow at a rapid rate. Against this background, both the quality and efficiency of translation become the common concern of many companies and institutions.

Translation technology, which can help increase translation productivity – leading to the improvement of both translation quality and efficiency, becomes increasingly popular among all parties involved in translation activities – translators, translation companies, and clients of translation services. In comparison with pure human translation, computer-assisted translation tools can increase translation efficiency by 20-50% while the translation quality is the same or better (School of Software and Microelectronics Beijing University, 2008).

And the role of translation technology is not limited to helping translators improve translation quality and efficiency. In software localization, website localization and multimedia localization, translation technology is indispensable. Without the specialized localization tools, translators will be unable to undertake such localization jobs, because it is impossible for average translators to command all the knowledge of computer science and

technology which is necessary to localize software, websites, and multimedia works. And enterprise-level computer-assisted translation tools can also provide a sophisticated information and communication technology (hereafter ICT) platform which integrates the translation automation system, translation workflow management system and outsourcing management system together. Transn Computer-Aided Translation and Management Platform of Transn Information Technology Co. (2008) is a good example, which has many functions like order management, customer management, project management, task management, resource management (including translators, editors, and reviewers), financial management, system configuration management, and translation automation. The enterprise-level translation technology brings great changes to translation companies, leading to the virtualization of their organizational structure.

In the previous paragraphs we have used these two terms – "translation" and "localization", which, though related to each other, are different in nature. So it may be beneficial to distinguish translation from localization here. Translation is the action of interpretation of the meaning of a source text and production of an equivalent target text (Translation, 2007); localization comprises all activities necessary for adapting a product to a specific locale, from translating to considering cultural contexts and target market needs (Esselink, 2000). So translation is only one of the activities in localization; in addition to translation, a localization project includes many other activities such as project management, software engineering, testing, and desktop publishing (Esselink, 2000). And the combination of translation, ICT, and commerce has produced a new industry – GILT (Globalization, Internationalization, Localization, and Translation) industry, or localization industry for short (Wang &Cui, 2005). So another difference between them is that translation is usually interpreted from the perspective of language conversion while localization is usually interpreted from the perspective of ICT and commerce. Since localization is a bigger and more sophisticated topic, in the thesis we will only focus on the use of translation technology in translation practice and the integration of translation technology into existing translation teaching.

Today the use of translation technology is a routine in the lives of professional translators. Typically they receive the electronic source text from the client or the translation company through email or the company's internal network, translate the source text into the target language on computer using various electronic translation tools among which translation memory systems, electronic dictionaries and search engines are the most common, and send the translation to the client or the project manager who is in charge of the translation project through the Internet or the company's intranet. And during the translation process the translator also uses various instant messaging programs like Tencent QQ and Windows Live Messenger to communicate with people involved in the translation project – clients, project

managers, editors, and reviewers, etc. From the simplified description we can see that in contemporary translation practice every link in the translation process cannot separate from the support of ICT. And related researches also confirm this. According to the EU-funded (European Union-funded) ASSIM (assessment of the economic and social impact of multilingualism in Europe) study in 1997 (Austermühl, 2006), more than 50 percent of the translators interviewed were using electronic dictionaries, and about one-third were using translation memory systems. And according to the Report of Investigation on the Development of Chinese Translation Companies (Science and Technology Translators Association of the Chinese Academy of Sciences & Transn Information Technology Co., 2007), 60 percent of the companies investigated required their translators to use computer-assisted translation tools, 70 percent were using instant messaging software, and 82 percent thought that the Internet played an important role in translation.

On the basis of the analysis above, we can reach the conclusion that in the background of social informationization the use of translation technology in translation practice has become a fait accompli and thus translation technology should become an essential component of translator training programs.

1.1.2 Translation Teaching

On the other hand, the current translation teaching programs in China are probably insufficient to develop English majors' ability to use translation technology and thus unable to meet the challenges presented by social informationization and the Chinese translation market needs. Mu Lei (1999) thinks that the current translation teaching in China is not satisfactory in discipline establishment, curriculum system, textbook compilation, teacher training, teaching methods, interpretation teaching, translation testing, and teaching research, and thus needs reform. Mu Lei also proposes that Chinese colleges do not pay due attention to translation technology and that there are few translation technology programs in China. And Yuan Yining (2005) concludes that at present the objective of translation teaching in most Chinese colleges is to develop college teachers, literary translators and interpreters, and that translation teaching follows the traditional model of translation theory and practice which focuses on linguistics and literature. So although the Chinese translation market needs a large number of competent translators who are able to use electronic translation tools and translate various types of texts, the current translation teaching in China has not responded properly to the translation market needs and social informationization. As a result many translation companies cannot find eligible translators so that they have to provide pre-service or in-service training programs inside their companies. Therefore there is a great contradiction between the current translation teaching in Chinese colleges and the current Chinese translation market needs.

What should we do to solve the problem then? One feasible solution is integrating

translation technology into the existing translation teaching systematically, and accordingly updating the contents of translation teaching and innovating in translation teaching methods. So the integration of translation technology into translation teaching, which may solve the contradiction between translation teaching and translation market needs and help English majors meet the challenge of social informationization, is a topic worth studying.

1.2 Purpose of the Study

Liu Miqing (2003) distinguishes TTBS from TTPS: TTBS means teaching of translation as a basic skill while TTPS stands for teaching of translation as a professional skill. And the term "translation teaching" in this thesis refers to TTPS, so the audience is students and postgraduates of translation or English specialty who will become professional translators.

Generally the aim of the thesis is studying the systematic integration of translation technology into the existing translation program for English or translation majors – a topic which has seldom been touched upon in China. And in translation companies translation is usually organized in the form of translation projects which are divided into translation task packages, so in order to imitate the real translation process, the thesis will also study the application of task-based learning as a new translation teaching method. And specifically the direct purpose of writing the thesis is to provide some useful learning and teaching materials for both students and teachers of translation. As what has been said, there are no published textbooks or monographs on translation technology written by Chinese scholars of translation studies available at present, so the thesis may fill the gap and be used as training materials of translation technology temporarily on various occasions. The body of the thesis is written according to the author's work experience in a translation company which is a member of Localization Industry Standards Association (LISA) and attaches great importance to using translation technology in translation practice, so translation teachers can integrate the materials created in the thesis into their existing teaching contents without major modification, and students can also learn the usage of these electronic translation tools by themselves as long as they have commanded basic computer operations. And the long-term purpose is that the thesis will have some positive impact on translation teaching and make contributions to the on-going translation teaching reform in China.

1.3 Structure of the Thesis

The thesis consists of five chapters. Chapter One is the introduction to the thesis. It discusses the need for the study, describes the purpose of the study and presents an overview of the thesis structure. Chapter Two is the literature review. It starts with the review on the previous studies on translation teaching contents and methods, and on the basis of the review it is proposed that it is time to integrate translation technology into translation teaching as a

new content and that task-based learning may serve as the ideal method for teaching translation technology. And then the previous studies on the new content and the new method are reviewed, which focuses on the principles and typologies of translation technology and the nature of task-based learning. Chapter Three studies the integration of the major electronic translation tools (translation memory systems) into translation teaching. It starts with a brief introduction to the major translation memory suites currently available on the market and the typical workflow of using translation memory systems, then demonstrates the usage of the various components of the Trados suite (a representative translation memory suite) in the phases of before-translation, during-translation, and after-translation, and finally the guidelines on teaching translation memory systems are discussed in detail. Chapter Four studies the integration of the other electronic translation tools into translation teaching. It first presents a general introduction to the other electronic tools for translators, and then demonstrates the usage of these tools – machine translation, electronic dictionaries, electronic encyclopedias, corpora, search engines respectively, and in the last section the guidelines on teaching these electronic translation tools are discussed briefly. And Chapter Five is the conclusion of the thesis. It summarizes the major points of the thesis, discusses the limitations of the study, and presents the suggestions for future studies on the basis of the discussed limitations.

Chapter 2. Literature Review

This chapter starts with the review on the previous studies on translation teaching contents and methods, and on the basis of the review it is proposed that it is time to integrate translation technology into translation teaching as a new content and that task-based learning may serve as the ideal method for teaching translation technology. And then the studies on the new content and the new method are reviewed, which focuses on the principles and typologies of translation technology and the understanding of task-based learning.

2.1 Studies on Translation Teaching Contents

In order to present a comprehensive review, the author examined the major monographs on translation teaching available in China – including *Translation Teaching: Practice and Theory* by Liu Miqing (2003), *English/Chinese Translation Textbooks in China (1949-1998)* by Zhang Meifang (2001), *Translation Teaching in China* by Mu Lei (1999), and *Teaching and Researching: Translation* by Hatim (2005), the major influential translation textbooks in China, including the textbooks compiled by Zhang Peiji, et al. (1980), Lv Ruichang, et al. (1983), Cheng Hongwei, et al. (2004), Ke Ping (1991), Yang Lili (1993), Feng Qinghua (2002), Wang Zhikui (2004, 2005), Feng Mengzhi (2005), Liu Miqing (1987, 1998), and some recently published journal papers on translation teaching written by Luo Xuanming (2002), Li Defeng (2006), Xiao Hong (2005), Li Shiwang (2007). In summary, the teaching contents of translation courses can be divided into two types: translation practice and translation theory. Translation practice usually includes topics like translation skills (such as adding, omitting, conversing, etc.), special subject discussion (such as word translation, long sentence translation, how to make the translation accurate, how to make the translation concise, etc.), and exercises. And translation theory usually discusses such topics as translation standards, the process of translation, the unit of translation, translator competence, etc. The existing textbooks and monographs of translation in China usually do not touch upon the topic of translation technology, or just make a mention of the impacts of IT (information technology) on translation and translators and do not go further.

But more and more Chinese scholars of translation studies have begun to realize the importance of translation technology as part of the translation teaching contents. Liu Miqing (2003) thinks that translation departments should establish the course of *IT and translation* for undergraduates of translation specialty. Fang Mengzhi (2005) proposes the formula: translator competence = language proficiency (both Chinese and English) + the translator's specialty + the ability to use IT. Fang uses the following words to explain the relationship between the

three components in his model of translator competence: "language proficiency and the translator's specialty constitute translators' translation ability, but at the present time whether translators can bring their translation ability into full play depends on their ability to use IT." And if we use the term "translation technology" – the part of information and communication technology which is related to translation – to substitute the term "IT", the diction will be more accurate. So it is a natural conclusion that translation technology should be one component of translation teaching since translators' ability to use translation technology is part of translator competence.

Although these influential scholars of translation studies have begun to realize the role of translation technology in translation teaching, today's translation technology teaching in China has two major inadequacies. One is that few works or textbooks on translation technology or its teaching have been published in China, and if any, they usually do not suit Chinese translators. For example, one of the few monographs on translation technology available at present – *Studies on Machine Translation* by Feng Zhiwei (2004), the famous computational linguist – is a book whose target audience is computational linguists rather than professional translators. Most existing teaching materials of translation technology are created temporarily in large-scale translation companies for the purpose of in-house translator's pre-service or in-service training, and thus are publicly unavailable. And the other is that we have not perceived the degree of the importance of translation technology in translation teaching accurately. If we look forward to the future of translation, translation teaching and translation technology, we will be able to see the second inadequacy more clearly. Just as Wang Kefei (2004) says, with the development and perfection of language data and networking, translation and interpretation teaching will definitely be influenced by new tools and technologies; Whoever takes the initiative can reach the frontline of the new trend and obtain the resources of innovation. And if we examine the current situation of translation technology teaching in the European countries and the United States, we will also be able to reach the same conclusion. In comparison, translation technology has been a well-established course and specialty in Europe and America for some time. Many European and American universities – among which University of Leeds, University of Limerick, Saarland University, Kent State University, and Monterey Institute of International Studies are representative – have established independent departments or centers of translation studies and various courses on translation technology – corpora for translation, translation memory, terminology management, machine translation, localization, project management, and specialized translation, etc. – are taught in these departments or centers. On September 30, 2007 the fourth version of Reference Curriculum for the Study Program for the "European Master in Translation Technologies" (EM-TT) was formulated, in which the study goals, competence framework, qualification profile, academic degree, and modules of EM-TT were prescribed

(MELLANGE, 2007). Today's translation technology teaching in Europe and America probably represents the trend of the global translation technology teaching. But the translation technology teaching materials developed by western scholars are usually not available to Chinese translation learners. And these materials usually do not touch upon the Chinese language, and thus will not deal with the special problems in computer-assisted English-Chinese and Chinese-English translation.

At present it is probably unrealistic to establish independent departments of translation studies in average Chinese colleges or independent courses of translation technology in departments of foreign languages. But integrating translation technology into the existing translation courses to update the existing translation teaching contents may be what can be done now. It is necessary to develop such materials suitable for Chinese translation learners as soon as possible so that we will not lag far behind.

2.2 Studies on Translation Teaching Methods

Comparatively, few previous studies focus on translation teaching methods, and thus there is little literature available. Generally translation teachers have reached the consensus that translation practice and translation theory should be combined in translation teaching, but the methods of combing them are various (Mu, 1999). Some teachers insist that translation practice should be guided by translation theory, and that the presentation of translation theory should reflect its latest development. Other teachers think that translation teaching at the undergraduate phase should focus on translation practice, so they will adopt the method of assigning exercises and commenting on the students' translations. In summary, the translation teaching methods above, which is also the most commonly used teaching methods in China, follow the teaching pattern of definition-explanation-example-test-summary, whose theoretical basis is the behaviorist theory of learning. Liu Miqing (2003) proposes that different translation teaching methods should be adopted at different levels of translation teaching – elementary, intermediate, and advanced. And he also provides several specific teaching methods, including an upgrading approach of supported translation, an upgrading approach of guided translation, tutorials, and workshops on a special subject or a specific case.

But the studies on translation teaching methods have three major inadequacies. One is that scholars do not attach due importance to translation teaching methods. Translation teaching methods are so crucial for translation teaching that we cannot afford to neglect them. The second is the lack of researches on the theoretical bases of the specific teaching methods or practices. Just as Mu Lei (1999) says, in the published works on translation teaching, the discussions on translation teaching methods are usually limited to specific practices of

teaching one particular translation skill, and discussions on the overall aspects of translation teaching are rare. Studies on translation teaching methods should be guided by both translation theories and learning theories, but obviously, we have not attached due importance to the role of learning theories in studies of translation teaching methods at present. And the third is that there are few studies on the teaching methods of translation technology. In 2.1 we have reached the conclusion that translation technology teaching is an integral part of translation teaching, so it is also necessary to study how to teach translation technology. It may be proper to apply task-based learning to translation technology teaching, which will be explored in the fourth section of the chapter.

2.3 Studies on the New Content

The new content of translation teaching – translation technology – is a wide field which covers several very different disciplines such as information and communication technology, translation studies, computational linguistics, and thus it is impossible to review all the literature on translation technology here. So we will confine the review of the previous studies to the typologies of translation technology which can provide the framework for the next two chapters of the thesis.

Many foreign scholars have made efforts to classify translation technologies and put forward different models of categorization. According to the degree of automation, translation technology can be divided into four types (Hutchins & Somers, 1992):

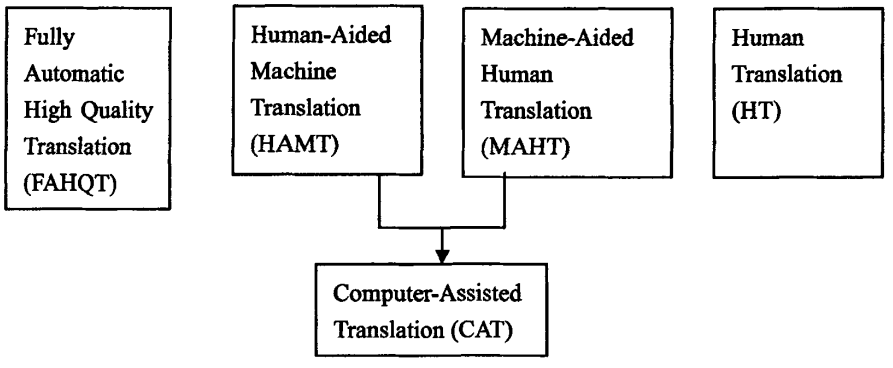


Figure 2—1. Four Types of Translation Technology According to the Degree of Automation

According to the process of computer-assisted translation, Melby (1998) proposes the model of eight types of translation technology.

	Term level	Segment level
Before translation	•Term candidate extraction • Terminology research	• New text segmentation, previous source-target text alignment, and indexing
During translation	• Automatic terminology lookup	• Translation memory lookup • Machine translation
After translation	• Terminology consistency check and non-allowed terminology check	• Missing segment detection and format and grammar checks

Table 2—1. Melby's Model of Eight Types of Translation Technology

And other scholars like Somers (2003), Sánchez (2006), Hutchines (2007) have also studied the classification of translation technology. These studies help understand the scope and classification of translation technology, but they also have some inadequacies. Melby's model covers the various aspects of the translation process, but the process described in the model is actually the typical workflow of using translation memory systems, and thus it neglects other aspects of translation technology like electronic resources and the software which is not developed specially for translators but commonly used by translators. The model proposed according to the degree of automation has similar problems, and what's more, the types in the model are too general for translators to know what each type actually refers to. Sánchez's classification appears to be complicated though comprehensive and specific. And Hutchines' model covers only machine translation systems and translation memory systems though it is very detailed.

On the basis of these studies, the author's supervisor Wang Tao and the author (2008) proposes a new model from the translators' perspective in the paper Concepts and Classification of Translation Technology published in *Chinese Science and Technology Translators Journal*. In the model translation technology is divided into four categories, and each category has several subcategories.

Translation technology	Position of the Tools and/or Resources	Example
Translation memory systems	Local/online	Trados suite
Machine translation systems	Local/online	Google Translate
Electronic resources	Local/online	Wikipedia
General software	Local/online	Microsoft Word

Table 2—2. Four Categories of Translation Technology Proposed by Wang Tao and the Author

In the thesis we define the term "translation technology" as all the information and communication technologies that are and can be used in translation practice, translation studies, and translation teaching; and specifically, it may refer to software, or language databases, or online translation services, etc. And we also use the term "electronic tools for translators" which is interchangeable with translation technology in this thesis.

The term – translation memory systems – is used as an umbrella term to cover the various components in translation memory suites, including terminology management tools, alignment tools, translation memory tools, and tag editors, etc. And software/multimedia/website localization tools are also classified as translation memory systems because translation memory is the essential part of such localization programs. And the basic idea of the translation memory systems is that we can store translated sentences together with the corresponding original sentences into databases on a computer so that when we meet with identical or similar sentences we can recycle the existing translations in the databases. So the core of the translation memory systems is the translation memory tool.

Machine translation systems can be defined as the "computerized systems responsible for the production of translations from one natural language to another, with or without human assistance" (Hutchins and Somers, 1992). One point we should pay attention to is that translation memory systems and machine translation systems are different in nature, and non-translators are usually more interested in machine translation systems while professional translators are usually more interested in translation memory systems.

Electronic resources refer to the digital data useful for translation on the local machine or the Internet, among which electronic dictionaries, electronic encyclopedias, corpora and World Wide Web are particularly important. And general tools refer to the software which is not specially designed for translators but is commonly used during translation process. General tools are not covered in the thesis because their usage is usually the major contents of courses like *Essentials of Computing.*

The first characteristic of the model is that it is comprehensive and concise. The second is that the key tools which are designed specially for translators – translation memory systems and machine translation systems– are duly emphasized. And the third is that it indicates the position of the translation programs and resources – local or online, which appears to be important in the times of the Internet.

For the sake of the thesis, we shall reorganize translation technologies into two categories: the major electronic tools for translators and the minor electronic tools for translators. The former refers to the translation memory systems, which are essential for professional translator and will be dealt with in chapter three. And the latter, which will be dealt with in chapter four, include machine translation systems, electronic resources, and

general software.

2.4 Studies on the New Method

The new method refers to task-based learning. Task-based learning (TBL) mainly originates from the literature of language learning (Nunan, 1989) and then is used as a teaching method in various disciplines because of its solid theoretical foundation and effectiveness in teaching practice. And here the author proposes that task-based learning may also serve as the teaching method for translation technology, which is perhaps one innovation in the studies of translation teaching.

The theoretical basis of task-based learning is the learning theory – constructivism. The basic idea of constructivism is that learners learn not by passively accepting what is transferred from the teacher, but by actively constructing their own knowledge. Concepts are regarded as building blocks or constructs to be grouped together into knowledge through learners' active involvement in the learning process and interaction with the environment. And constructivism has mainly four variants: cognitive constructivism which focuses on the importance of the mind in learning (Piaget, 1955), social constructivism which concentrates on the key role played by environment and the interaction between learners (Vygotsky, 1986), radical constructivism which emphasize the subjectivity of an individual's knowledge (Glasersfeld, 1995), and neoconstuctivism which attaches importance to the integration of prior knowledge, short-term memory, and sensory experience in the learning process (Osborne & Wittrock, 1983). These variants of constructivism, though there are some differences between them, are not mutually exclusive. In sum, constructivism emphasizes that learners play the central role in the learning process and that learners use their prior concepts to construct new knowledge that is meaningful for them in an ongoing process of construction, evaluation, and modification, in short, learning by doing and interacting. And task-based learning is one specific application of constructivism.

When we talk about task-based learning, it is necessary to understand what a translation task is, and how a translation task is different from a traditional translation exercise. Researchers on language teaching (Nunan, 1991; Willis, 1996; Estaire & Zanon, 1994; Ellis, 2000; Skehan, 1998; Widdowson, 1998; Guo, 2006) have made profound and extensive studies in differentiating tasks form exercises. And since translation is a purposeful activity of communication (Nord, 2001), on the basis of these studies we can define a translation task as a goal-oriented activity which is near to the real translation task professional translators undertake in translation companies and thus is meaningful for the learners. And we can use the following criteria adapted from Guo Yijun (2006) to differentiate tasks from exercises.

	Exercise	Task
Orientation	Translation skills are viewed as the prerequisite for undertaking translation tasks	Translation skills are developed from engaging in translation tasks
Focus	Linguistic form and semantic meaning	Propositional content and pragmatic meaning
Goal	Manifestation of code knowledge	Achievement of a communicative goal
Outcome evaluation	Performance evaluated in terms of conformity to the standard	Performance evaluated in terms of whether the communicative goal has been achieved
Real-world relationship	Internalization of translation skills serves as an investment for future use	A direct and obvious relationship between the activity that arises from the task and natural communicative activity

Table 2—3. Criteria of Differentiating Translation Tasks from Translation Exercises

Among these criteria, the fundamental one is the relationship between the translation task and the real world.

Willis (1996) divides tasks into the following categories: (1) listing; (2) ordering and sorting; (3) comparing; (4) problem-solving; (5) sharing personal experiences; (6) creative tasks, among which problem-solving may be the most important type of tasks in translation teaching. And task-based learning usually consists of four procedures: pre-task, task preparation, task realization, and post-task. And when we use the method of task-based learning in translation technology teaching, we must also pay attention to the factors which influence task design. In sum, task-based learning provides us with guidelines for translation technology teaching.

Chapter 3. Translation Teaching – Integrating the Major Electronic Tools for Translators

This chapter starts with an introduction to the major translation memory systems and the typical workflow of using them; and then demonstrates the usage of the various tools in the Trados suite, the representative translation memory system, in the phases of before-translation, during-translation, and after-translation; finally, a discussion on the pedagogical guidelines on teaching translation memory systems is presented.

3.1 Introduction

A translation memory (TM) tool is a type of computer-aided translation (CAT) tool which stores previously translated texts alongside their corresponding source texts (ST) and allows translators to re-use these texts, or parts of them, in new translations (Wallis, 2006). And it is usually published together with various supplementary tools like terminology management tools, alignment tools, and various filters to form a translation memory suite. In this thesis the major electronic tools for translators refer to the translation memory tool as well as the supplementary tools published together with it; both are contained in the software suite sold to customers.

At present there are a variety of translation memory suites available, which are either commercial or open-source. The major translation memory suites are as follows: Trados, Yaxin, SDLX, Déjà Vu, Wordfast, Star Transit, OmegaT, Heartsome, Logoport, IBM Translation Manager, Alchemy Catalyst, PASSOLO, LocStudio, and Helium. Most of the translation memory suites are proprietary software and developed in foreign countries.

From the angle of teaching, it is impossible to teach learners the usage of all these translation memory suites, so it is necessary to select a representative one from them. And an alternative method is to develop teaching materials which are independent from any particular translation memory suite, which is adopted in such projects as eCoLoRe (2005). But according to the author's examination of the teaching materials developed by eCoLoRe, the project actually selects the features provided by several translation memory suites like Trados, SDLX, Déjà Vu, and Transit in different parts of their teaching materials, which is disturbing in the author's point of view. So we will adopt the first method and select one representative translation memory suite so that the consistency of the materials developed in this chapter will be guaranteed. Indisputably the Trados suite is the leader among translation memory products,

and the major functions of the Trados suite are also provided in other translation memory suites in one form or another, so we will choose to teach the usage of the Trados suite whose version is SDL Trados 2006 and SDL MultiTerm 7.

After we have selected the translation memory suite to be learnt, the next problem we need to consider is the typical workflow of using the Trados suite. In the authoritative book *A Practical Guide to Localization* Bert Esselink (2000) divides the workflow of a typical localization project into fourteen steps: pre-sales phase, kick-off meeting, analysis of source material, scheduling and budgeting, terminology setup, preparation of source material, translation of software, translation of online help and documentation, engineering and testing software, screen captures, help engineering and desktop publishing (DTP) of documentation, processing updates, product quality assurance (QA) and delivery, and project closure. The typical workflow described by Esselink, though authoritative and detailed, is actually the workflow of software localization – a topic which the thesis will not touch upon, and thus is too complicated for the purpose of the thesis.

Melby's model of translation technology, which we have examined and commented on in the previous chapter, is proposed according to the typical workflow of using a translation memory suite. And in his framework, the workflow of using a translation memory is divided into three phases – before translation, during translation, and after translation. Melby's framework is concise and sufficient for the purpose of the thesis, so it is probably proper to adopt Melby's three-phase workflow in developing teaching materials on the Trados suite.

In the following sections of teaching material development in the chapter, we will use a simple translation project (the translation of a short Microsoft Word document) to introduce the major tools contained in the Trados suite and demonstrate their major usage in the three-phase workflow.

3.2 Before Translation

In this section and the following two sections, the task is to translate the following English text into Chinese:

> In the swamps of Everglades National Park, there is much to be learned about the unusual adaptations and delicate balances that support the Everglades' stunning array of life. You might see white egg sacs on a branch that will soon hatch apple snails, the main food of the endangered snail kite, which has a special bill for removing the snails from their shells. Or you might learn about a fish called the gar, which has an air bladder that acts like a primitive lung that allows it to live encased in mud during the dry season. The source of all this life is water, with its cycle of flow and drought. During the wet season, from mid-April

to mid-December, the Everglades becomes a river only inches deep but miles wide. It flows so slowly that its movement is all but invisible. In the dry season, during the winter months, the park's rich pulse of life slows down and awaits the new flow of water. (The Editors of Consumer Guide, 2006)

We may save the above paragraph as everglades-national-park-ga2-en.doc.

And we suppose that we have translated the first part of this paragraph as follows:

美国大沼泽国家公园的沼泽地，生物适应性独特，脆弱的生态平衡维持着众多生物的生命；在这些方面，尚有诸多有待了解。你可能看到树枝上挂着白色的卵囊，小苹果蜗牛就快孵出来了。而苹果蜗牛又是另一种濒危动物蜗牛鸢的主要食物；蜗牛鸢的喙很特别，可以把苹果蜗牛从壳里钩出来。(Translated by the author)

We may save the above translation as everglades-national-park-ga2-align-cn.doc, and save the corresponding source text as everglades-national-park-ga2-align-en.doc.

And we also suppose that we have prepared the following glossary through terminology research:

English	Chinese	English	Chinese
a primitive lung	原始肺	an air bladder	鳔
Everglades	美国大沼泽国家公园	the dry season	旱季
the wet season	湿季	gar	雀鳝

Table 3—1. Glossary Prepared through Terminology Research

We may save the glossary as everglades-national-park-ga2-term.doc.

It is perhaps beneficial to have a brief overview of the major component tools of the Trados suite here before we enter the part of using them. The Trados suite consists of the following major component tools: Translator's Workbench, TagEditor, WinAlign, T-Window for clipboard, various filters, MultiTerm, MultiTerm Convert, and MultiTerm Extract, among which Translator's Workbench – the translation memory tool – is the core component. We will demonstrate the major features of these tools in detail by translating the paragraph in this section and the following two sections of this chapter.

And in the phase of before-translation, there are many preparatory tasks to be done. Actually preparing translation projects can be very time-consuming, which is usually highly underestimated (eCoLoRe Project, 2005). And project preparation varies greatly according to the type of documents to be translated, which may roughly include the following tasks: file structure management, preparing style guide, word count, project analysis, preparing the translation memory, alignment, segmentation, special tagging, pre-translation, machine translation, terminology research, termbase population, configuring hardware and software, test source material, preparing source material to be sent out to external translators, collection of reference material, and translator training. Here we will examine some of the essential

tasks involved in the phase of before-translation.

3.2.1 File Management

A translation project may involve various types of electronic data, and thus it is easy to forget the location of the files involved. So in order to avoid loss of information and be able to find the files as quickly as possible, it is essential that every translation project should have a central folder with a standard folder structure.

We can establish a dummy folder structure in advance to facilitate file management. The dummy folder structure contains all the necessary empty folders and subfolders with appropriate names. So when we receive a new translation project, we can simply copy the established dummy standard folder structure and paste it to the location of the new translation project. Then we may put the files of the new translation project into the responding folders in the standard folder structure. And we may also add the special folders which are not available in the standard folder structure and delete the folders which are not necessary in the project if necessary.

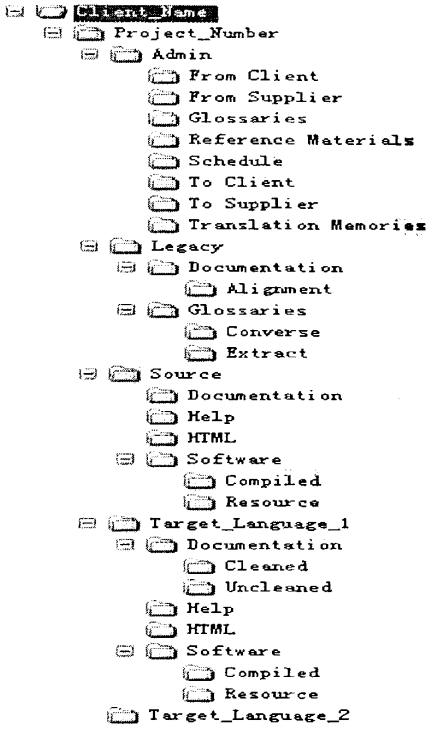


Figure 3—1. Dummy Standard Folder Structure

We may use the operating system's file manager to create the dummy standard folder structure which may look like the picture on the left (Esselink, 2000). And we may have a look at its structure. The first level is the client name, the second is the project number such as project_1, and the third contains a number of folders: project administration, legacy materials, source text, target language one, target language two. The folder of administration contains administrative information like schedule. The folder of legacy materials contains the files which can be converted into Trados translation memory and/or terminology. And the folders of source text and target text contain all the files to be translated and translated, whose contents depend on the file types we need to cope with.

As for the translation project we have just described, we may establish the central folder of the translation project on the basis of the dummy folder structure with some deletions. After adaption, we can establish the central folder of our demonstration translation project which looks like the following picture.

Figure 3—2. Central Folder of the Demonstration Project

In the central folder of the demonstration translation project, the unnecessary folders have been deleted because the project is simple. After the establishment of the work folder of the project, we put our files into the corresponding folders. Now we have four files: the first file named everglades-national-park-ga2-en.doc should be put into the folder of Source\Documentation and Target_Language_1\Documentation\Uncleaned, the second named everglades-national-park-ga2-align-cn.doc and the third named everglades-national-park-ga2-align-en.doc should be put into the folder of Legacy/Documentation/Alignment, and the fourth named everglades-national-park-ga2-term.doc should be put into the folder of Admin\Glossaries. We may also download the web page http://travel.howstuffworks.com/everglades-national-park-ga2.htm and put it into the folder of Admin\Reference Materials.

Using a work folder and the standard folder structure may seem complicated at first sight, but we will benefit in the long run, especially when our project becomes larger and more complicated, because the centralized file management and the standard folder structure will greatly facilitate the management of electronic files.

3.2.2 Alignment

Alignment means linking the sentences in the source text with the equivalent translated sentences in the translation document to produce a bilingual file containing translation units. The alignment tool in the Trados suite is WinAlign. If you have both the source text and its translation which are stored in separate files, WinAlign is useful in creating a bilingual file to be imported into an existing translation memory. The mechanism of WinAlign is: after we have selected the source language file and the corresponding target language file, WinAlign will examine the two separate documents to determine the sentence pairs that belong together and produce a text file which can be imported into an existing translation memory so that the Workbench can reuse the previously translated files. In this way we can obtain a larger translation memory from these legacy materials and leverage the previously translated materials. In the following we will use the demonstration translation project to show the workflow of alignment, including setting up an alignment project, aligning a Word file pair,

reviewing and editing the alignment result and importing the reviewed alignment result into an existing translation memory. Now we begin to align the English source file with the Chinese target file we have saved.

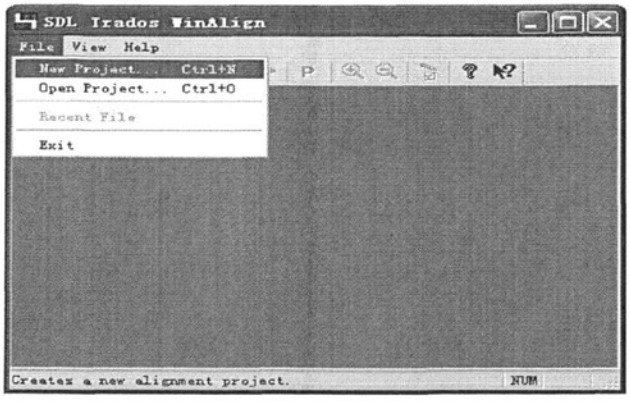


Figure 3—3. WinAlign

First we start WinAlign, and its interface looks like the picture on the left. To create a new alignment project we click on the "New Project" command from the "File" menu in WinAlign, and the "New WinAlign Project" dialog appears, in which we can configure the settings of the alignment.

The "New WinAlign Project" dialog looks like the following picture. In General tab we can first enter the name of the alignment project in the "Project Name" text field: everglades-national-park-ga2-align. We can also specify the source language and the target language by clicking on the "Source Language" button and the "Target Language" button and selecting English (United States) and Chinese (PRC) from the language list. And in the section of "File Preferences", we can specify the file format of the documents in the current alignment project by clicking on the "File Type" dropdown list and selecting "Microsoft Word Documents (*.doc)" from the list. From the list we can see that WinAlign supports a number of file types like DOC, RTF, HTML, XML, SGML, PPT, XLS.

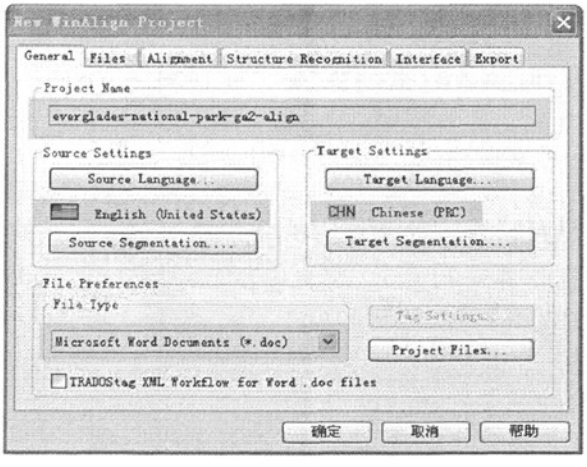


Figure 3—4. New WinAlign Project – General

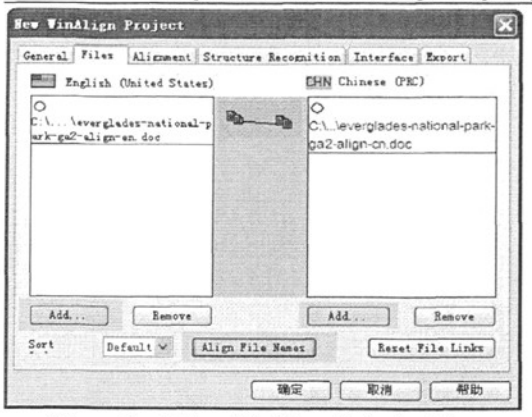


Figure 3—5. New WinAlign Project – Files

In Files tab we can specify the files to align by clicking on the "Add" button and selecting the file everglades-national-park-ga2-align-en.doc from the "Add Source Files" dialogue and the file everglades-national-park-ga2-align-cn.doc from the "Add Target Files" dialogue. Then we can align the file names by clicking on the button "Align File Names".

At this point we have configured the major settings of the alignment project and we can proceed to the actual alignment process. But if we would like to fine-tune the alignment so that we can obtain better alignment result and save time in the step of reviewing and editing the alignment result, we can use the options in the "Alignment" tab and the "Structure Recognition" tab. However these options may take length to explain, so we will leave the default settings unchanged in this alignment project. Now we click on the "OK" button to finish the setting-up of the project and the window – "Project: everglades-national-park-ga2-align (Microsoft Word Document Files)" – appears automatically.

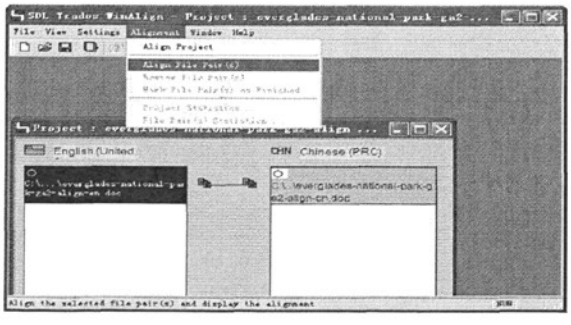


Figure 3—6. Aligning File Pair(s)

To execute the alignment, we click on the "Align File Pair(s)" command from the "Alignment" menu and the alignment process begins. After the alignment is finished, the alignment result is displayed in the alignment editor in which we can review and edit the alignment result.

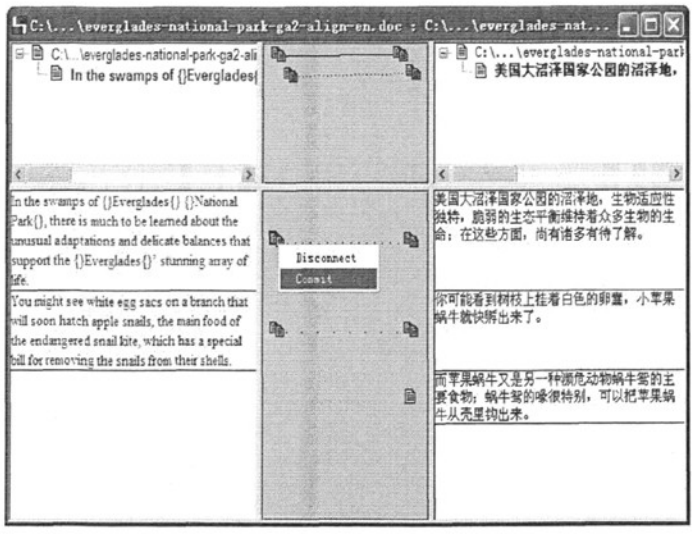


Figure 3—7. Reviewing and Editing the Alignment Result

In the alignment editor the source segments are on the left-hand side and the equivalent target segments on the right-hand side. And there is a dotted line between the aligned source and target segments which indicates that the link need to be confirmed. WinAlign uses a number of criteria to guess which source segments should be aligned with which target segments, but this does not guarantee that the alignment result will be 100% correct. Misalignments may take place. So it may be necessary to edit the alignment result and correct errors in the alignment editor.

We may have a look at the result of this alignment project. We can see that the first sentence is correctly aligned, so we can just confirm the alignment by right-clicking on the icon next to the source sentences and selecting the "Commit" command from the context menu, and then the dotted line becomes a line which indicates that the alignment has been confirmed. But the second sentence is misaligned; so we may first disconnect the segments involved in the error by selecting the "Disconnect" command from the context menu, and then connect the segments together by clicking on the icon next to the source segment and drawing two connection lines to the icons next to these two target segments, that is, drawing two lines between the second English sentence and the second Chinese sentence "你可能看到树枝上挂着白色的卵囊，小苹果蜗牛就快孵出来了。" and the third Chinese sentence "而苹果蜗牛又是另一种濒危动物蜗牛鸢的主要食物；蜗牛鸢的喙很特别，可以把苹果蜗牛从壳里钩出来。". From this example we can also see that WinAlign can handle 1:1 alignments (i.e. situations in which one source segment corresponds to one target segment), 1:n alignments (i.e. situations in which one source segment corresponds to more than one target segment), and n:1 alignments (i.e. situations in which more than one source segment corresponds to one target segment). And in the alignment editor, besides disconnecting and re-connecting segments, we can also perform other operations like editing the words in a segment, joining, splitting, and inserting segments, which are similar to the operations in a text editor like Microsoft Word.

After finishing the review, we may save the alignment project by clicking on the "Save Project" command from the "File" menu to save the project as

everglades-national-park-ga2-align.pjt in the folder Legacy\Documentation\Alignment. And we may also export the alignment result into a bilingual text file by selecting the "Export File Pair" command Export File Pair(s)... from the "File" menu. And then the "Export File Pair to File" dialog appears, in which we specify the name and location of the text file: everglades-national-park-ga2-align.txt and Legacy\Documentation\Alignment. The exported text file can be imported into an existing translation memory later, which will be demonstrated in 3.2.3.

3.2.3 Translation Memory Creation

Since we do not have a translation memory yet, we need to create a new translation memory database for our project. First we start Trados Translator's Workbench whose interface looks like the following picture. To create a new translation memory we click on the "New" command from the "File" menu, and the "Create Translation Memory" dialog appears, in which we will configure the settings of the new translation memory.

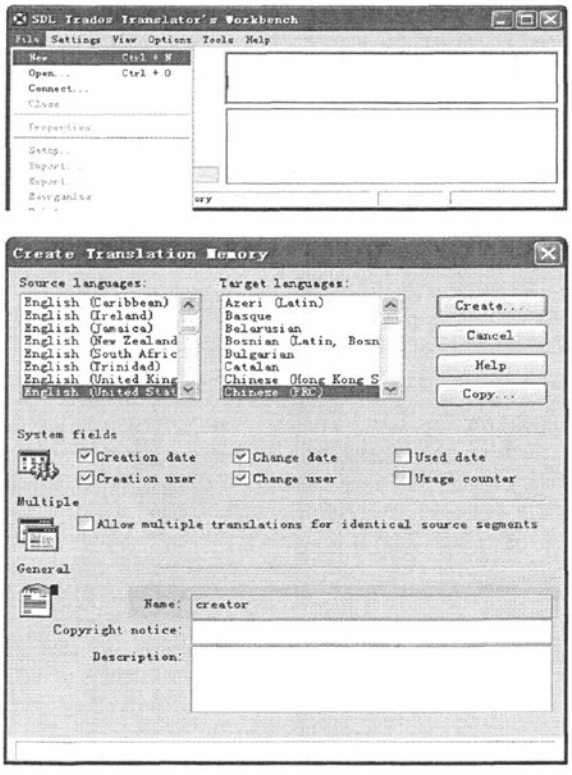


Figure 3—8. Translation Memory Creation

In the dialog we can specify the source and target languages and enter the name of the new translation memory creator. We then click on the "Create" button, specify the folder (Project_1\Admin\Translation Memories) in which the new translation memory should be stored, enter the name of the translation memory everglades-national-park-ga2-tm, and click on the "Save" button. Thus the new translation memory is created.

But the new translation memory is empty, so in order to make it useful to the translation project we may import the alignment result text file into the translation memory.

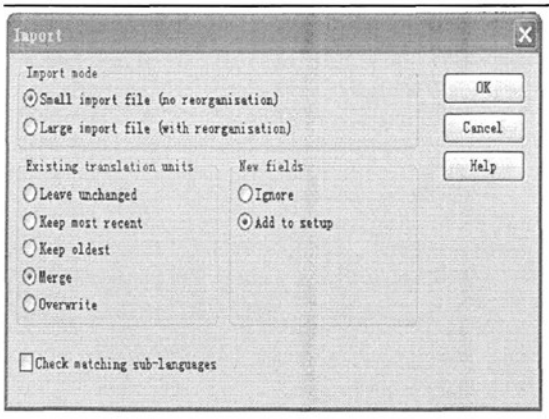


Figure 3—9. Importing Translation Memory

In Workbench we click on the "Import" command from the "File" menu, and the "Import" dialog appears. Here we use the default settings, so we just click on the "OK" button. And the "Open Import File" dialog appears, in which we can designate the file everglades-national-park-ga2-align.txt to import. At last we click on "Open" to execute the import.

After the import we can see the number of the translation units (two units in this case) `Import finished successfully. 2 TUs read in 0 seconds: 0 updated, 2 added, 0` which were added to the translation memory in the Workbench status bar.

3.2.4 Project Analysis

Project analysis is a useful batch function Workbench offers, which compares the contents of the source file to the translation memory that is open in Workbench, calculates the number of the exact and fuzzy matches and work out the number of the words to be translated. One point we should pay attention to is that the translation memory to use for the analysis has to be open in Workbench before we start the project analysis.

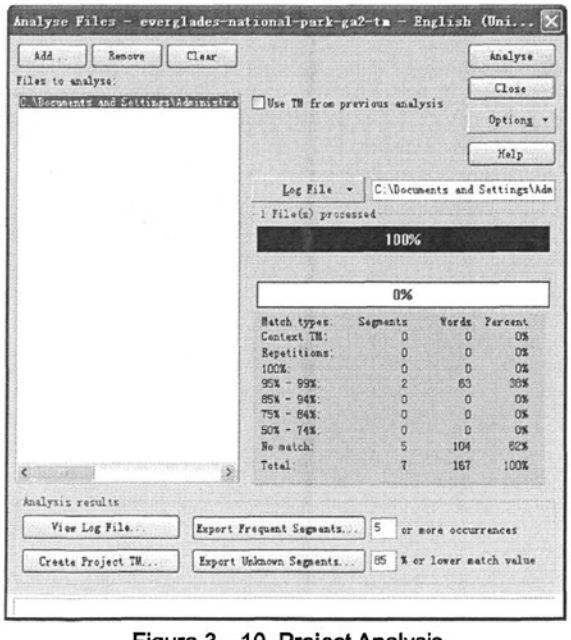


Figure 3—10. Project Analysis

To start project analysis we open the translation memory we have just created and click on "Analysis" from the "Tools" menu, and the "Analyze Files" dialog appears, in which we can configure the settings of the analysis. In the dialog we can add the file to analyze (Project_1\Target_Language_1\Documentation\Uncleaned\everglades-national-park-ga2-en.doc) and specify the location of the log file (we may use the default location). Then we click on the "Analyze" button and start the analysis.

Then we can see the statistical information in the window as well as in the analysis report which is stored in the log file. The analysis results are divided into nine categories: Context TM,100% Matches, Fuzzy Matches with degrees of similarity (ranging from 99% to

50%), No Matches, and Repetitions that occur in the text. On the basis of the statistical information project managers can calculate the volumes of the translation exactly so that they can make a schedule for the project. In the demonstration project, we can see that two segments have fuzzy matches (the similarity is 95% - 99%) and five segments have no matches. The total words to translate are 167 words, among which 63 words can be translated by the function of Workbench – "Translate", which is the focus of 3.2.5.

3.2.5 Pre-Translate

Pre-translation is another useful batch function of Workbench which pre-translates one or more source documents using an open translation memory.

To start the pre-translation we click on "Translate" from the "Tools" menu in Workbench, and the "Translate Files" dialog appears, in which we can configure the settings of the pre-translation. In this dialog we can click on the "Add" button to designate the file (everglades-national-park-ga2-en.doc) to pre-translate, set the minimum match value as 90% (the default is 100%) for segments to be translated, and designate the location of the log file containing the statistical information. At last we click on the "Translate" button to start the process.

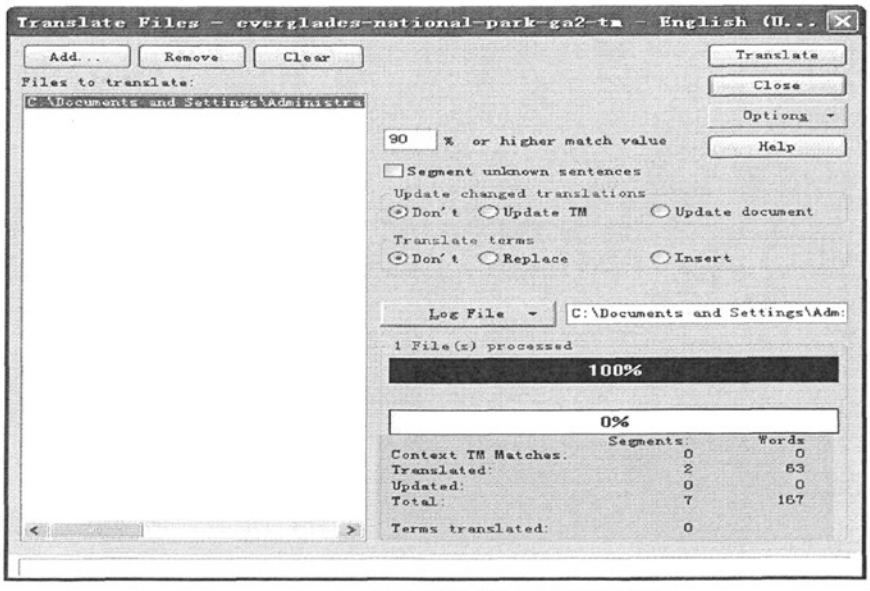


Figure 3—11. Pre-translation

Then we can see the statistical information in the window as well as in the report which is stored in the log file. In the operation there are two segments which contain 63 words are translated.

The pre-translate function is very useful if we pre-translate a number of files using a large translation memory because it can segment the source text and insert the matches into the document automatically.

3.2.6 Termbase Creation

Since we do not have a termbase yet, we need also to create a new termbase for the translation project.

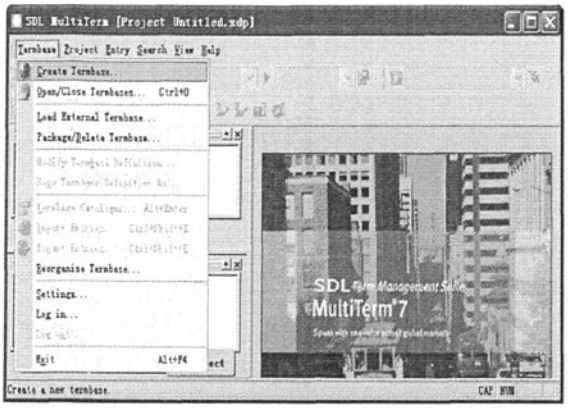


Figure 3—12. SDL MultiTerm

First we start MultiTerm whose interface looks like the picture on the left. To create a new termbase we click on the "Create Termbase" command from the "Termbase" menu, select a folder (Project_1\Admin\Glossaries) for the new termbase and the "Termbase Wizard" appears which will guide us through the process of creating the new termbase.

The wizard of creating a new termbase and a new termbase definition includes five steps – creating or specifying a termbase definition for the new termbase, specifying a name for the termbase, adding index fields for the termbase languages, adding descriptive fields and specifying their properties, defining the structure of the entries in the termbase.

In the first step, we choose the option – "Create a new termbase definition from scratch". In the second step, we specify the name of the new termbase – everglades-national-park-ga2-termbase. In the third step, we add the index fields for the termbase, that is, select the languages we wish to include in the termbase – Chinese (PRC) and English (United States). And in the fourth step, we add descriptive fields and specify their properties (the default data type for all descriptive fields is text). To do this, we first enter the fields in the "Field label" textbox, click on the "Add" button and the new fields will appear in the "Available descriptive fields" list. The common descriptive fields include subject, definition, source, context, and grammatical information.

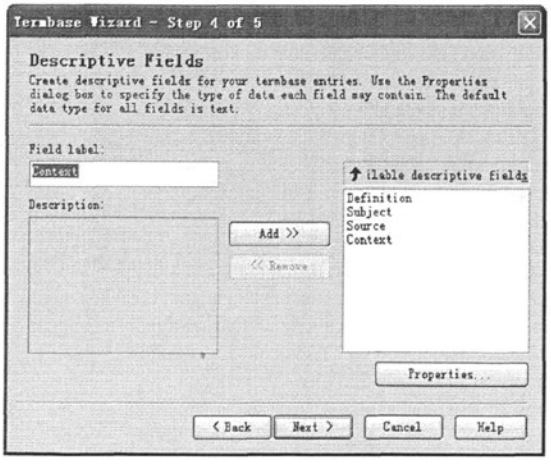


Figure 3—13. Termbase Creation – Step 4

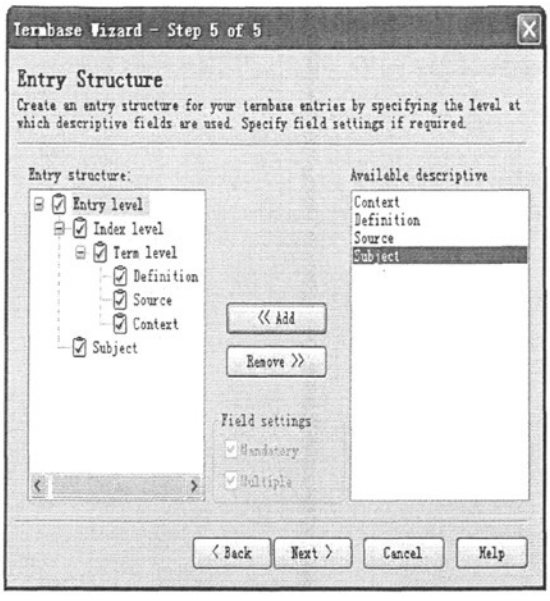


Figure 3—14. Termbase Creation – Step 5

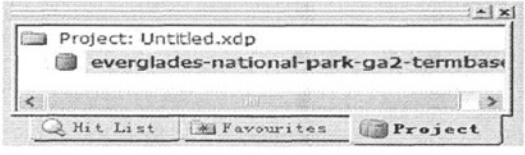


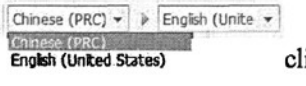
Figure 3—15. Termbase Created

And in the fifth step, we define the entry structure in the termbase, that is, apply the descriptive fields we have just created in the previous step to the different levels of an entry – including entry level, index level, and term level. In this demonstration, we apply the fields of "source", "definition", and "context" to the term level, and "subject" to the entry level. Then we click on the "Next" button and the "Finish" button to complete the termbase creation process. And thus the name of the newly created termbase (everglades-national-park-ga2-termbase) is displayed in the "Project" tab in MultiTerm, indicating that the termbase is now open. And at last we can save the project as in the folder Project_1\Admin\Glossaries by clicking on the "Save project" command from the "Project" menu.

3.2.7 Termbase Population

Since an empty termbase is not useful in translation, we will here populate the termbase with the terms we have prepared through terminology research.

We first open MultiTerm and the "everglades-national-park-ga2-termbase" termbase we have just created.

Second, we set up the language direction of the termbase. There are two ways to change the language direction. One way is to 

click on the down arrow in the source and target language fields, open a pick list of database-defined languages and select the source and target language. In doing so, we can change the language direction of the database for viewing entries and searching terms. And the second way is to click on the blue arrow between the source and the target language fields. Here we just have to click on the blue arrow and thus set English as the source language and Chinese as the target language. The language direction is important for searching, since you can only look up English terms if the language set as source language is English.

Third, we enter terms we have prepared. We go to the "Entry" menu and click on the

"Add" command. And MultiTerm switches to the edit mode automatically and shows the existing languages available in the termbase.

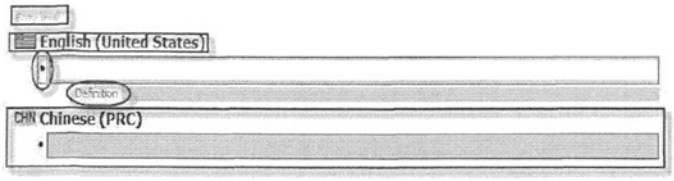


Figure 3—16. Adding New Terms

By left-clicking on the name of a data field (e.g. Term, Definition) the corresponding field opens to be edited. For example, by clicking on the field name of Term (which is indicated by the icon) in one language, an entry field opens where we can type in or paste the new term. And by right-clicking the field name we can open a list containing sub-fields. We can then choose the sub-field we want to add, press the Enter key, and the sub-field will be created. Once the new field has been created we can click on the field name and enter appropriate information. To save all the changes and go back to the view mode, right-click anywhere on the entry pane and select the option "Save" from the context menu.

For example, if we would like to enter the term "Everglades", we first click on the field name of Term in the source language (English) and the background of the text box turns white from grey, which indicates that the text box is open and that we can enter a term. We type in the term "Everglades" in the text box, and click anywhere on the blank space of the entry panel to close the text box. And then we can enter the corresponding term "美国大沼泽国家公园" in the target language (Chinese) in the same way. At last we can click on the "Save" command from the "Entry" menu.

Figure 3—17. Navigation Pane

If we have a mistake we can edit the existing entries. If we want to delete the whole entry, we can select the entry we want to delete in the left-hand navigation pane, go to the "Entry" menu and click on "Delete". If we want to modify an existing entry, we need to change from the view mode to the edit mode in MultiTerm. To do this, we go to the "Entry" menu and click on "Edit", and then we can open the text box and edit, which is similar to populating terms.

3.3 During Translation

After having made the necessary preparations we reach the phase of during-translation,

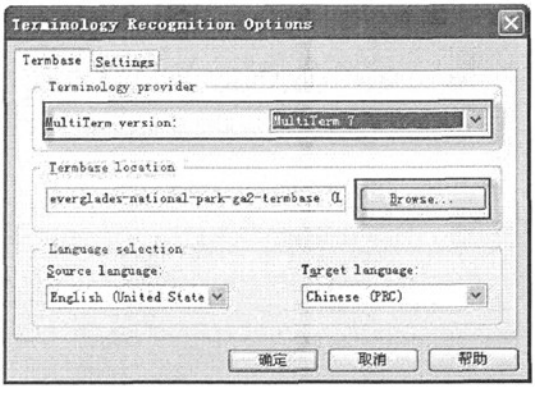
in which translators need to know how to work with translation memory database and termbase – the major components of the Trados suite.

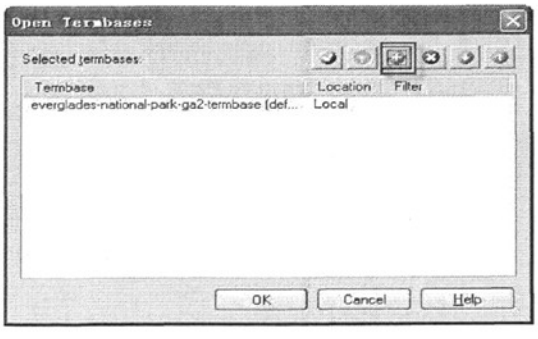
3.3.1 Setting up Workbench

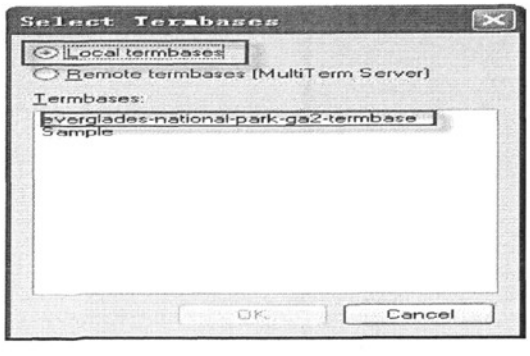
Before we start translating it is necessary to prepare the environment by setting up Workbench so that Workbench can serve as the interface which links the translation memory, the termbase, and Microsoft Word together.

First we launch Workbench via the "Start" menu from the "SDL International" program group. Then we open Word and resize the Workbench window and the Word window to make the former cover the upper third of the screen and the latter the rest of the screen.

We can configure the interface between Workbench and MultiTerm via the "Term Recognition Options" command from the "Options" menu of Workbench. And we do not have to run MultiTerm when setting up the term recognition options or during translation.







In "Term Recognition Options" window, we will focus on the options in "Termbase" tab. First we select "MultiTerm 7" from the "MultiTerm version" dropdown list. Second, we select the termbase location. We click the "Browse" button and the "Open Termbases" window appears, in which we can click on the "+" button and the "Select Termbases" window appears. In the "Select Termbases" window we click on "Local Termbases" button and select the "everglades-national-park-ga2-termbase" termbase from the "Termbases" list. We click on "OK" in the "Select Termbases" window and we are able to see that "everglades-national-park-ga2-termbase" appears in the list of "Selected termbases". Then we confirm the selection by clicking on "OK" in the "Open Termbases" window. One new feature of MultiTerm 7 is that translators can look up terms in several termbases as long as these

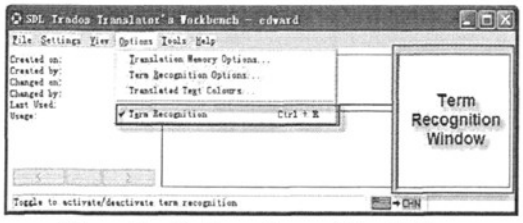


Figure 3—18. Term Recognition Options

termbases are selected here. At last we select the termbase language and click on "OK" in the "Term Recognition Options" window and this takes us back to the main program window of Workbench. To enable the term recognition function, we need also to check the "Term Recognition" command from the "Options" menu. Now we have activated the term recognition function, and we can see that the term recognition window appears in Workbench.

After the setting-up, all the terms that occur in the source document and match the terms from the selected termbase will automatically be displayed in the term recognition window for translators to choose from.

3.3.2 Opening Files for Translation

In Workbench we should first open the translation memory we are going to work with. In our example we select the "everglades-national-park-ga2-tm.tmw" translation memory. To do this we select "Open" from the "File" menu of Workbench. And then we find the location of the "everglades-national-park-ga2-tm.tmw" translation memory and select it. Now the translation memory is active and the current language pair is indicated by the flags in the status bar of Workbench.

In MS Word we open the source document "everglades-national-park-ga2.doc". We need to make sure that the Trados toolbar, MultiTerm toolbar, Trados menu, and MultiTerm menu are visible. The toolbars are automatically created during the installation of the TRADOS suite, and the most commonly used Workbench functions can be controlled through the buttons in the toolbars.

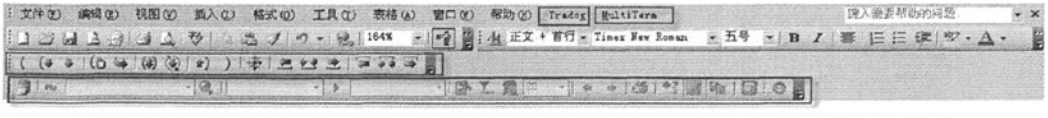


Figure 3—19. Trados toolbar, MultiTerm toolbar, Trados menu, and MultiTerm menu

Our screen should now look as shown below. Workbench contains three windows: the source window, the translation memory window, and the term recognition window; Word contains the Trados toolbar and menu, and the MultiTerm toolbar and menu; and the first two sentences have been translated.

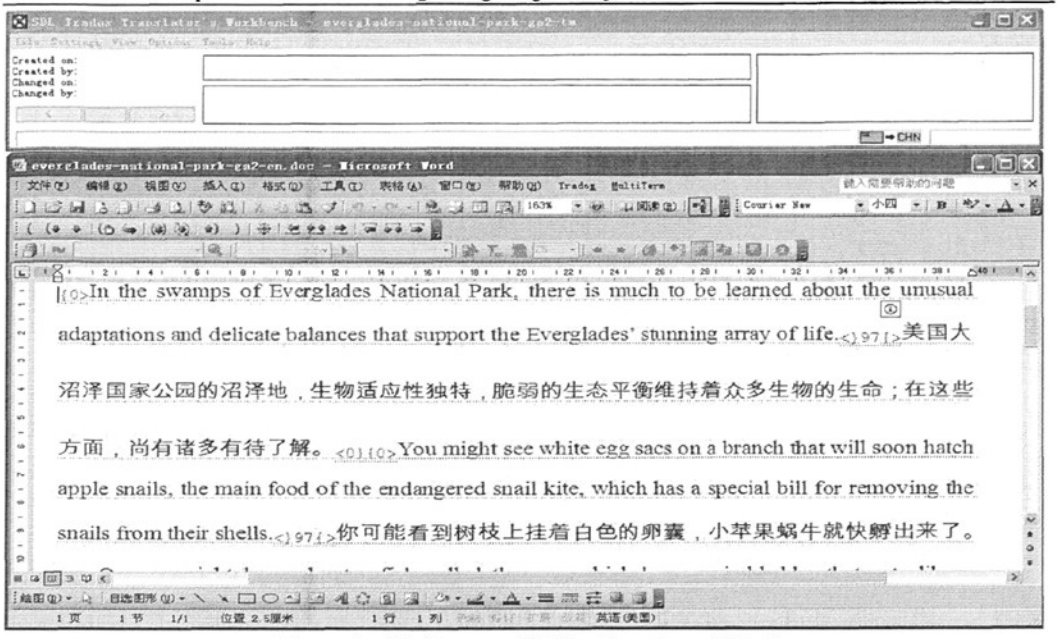


Figure 3—20. Screen with Workbench and Word

3.3.3 Retrieving Sentence from the Translation Memory

First of all we need to understand the functions of the buttons in the Trados toolbar.

Figure 3—21. Trados Toolbar

There are sixteen buttons. In turn they are Open, Open/Get, Get, Restore Source, Copy Source, Set/Close Next Open/Get, Translate to Fuzzy, Set/Close, Set, Concordance, Get Previous Placeable, Get Current Placeable, Get Next Placeable, Get Previous Term, Get Current Term, Get Next Term. And we also need to know the shortcuts of these buttons which can be seen from the Trados menu. Now we will begin to translate the source text.

In Word we position the cursor at the beginning of the source text and click on "Open/Get" on the Workbench toolbar. Workbench tries to find a match for the current sentence in the translation memory database. The upper window in Workbench, that is, the source window, shows the sentence that was transferred from Word to Workbench. The window below, that is the translation memory window, shows the corresponding sentence from the translation memory database and its translation if a match is found.

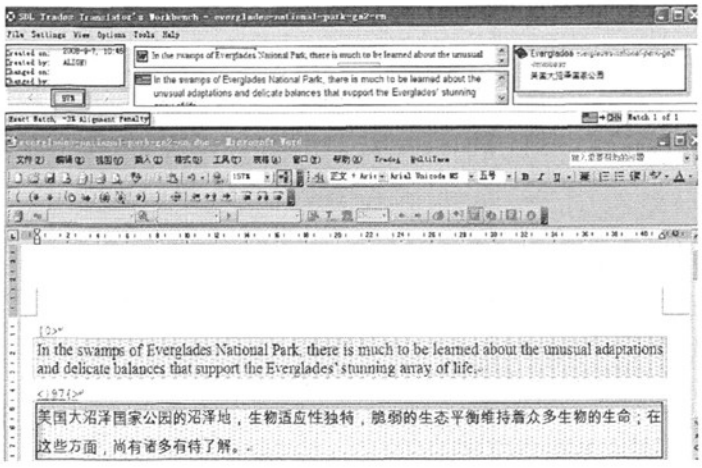


Figure 3—22. Exact Match

In our example Workbench has found an exact (i.e. 100%) match (the value displayed is 97%; there is an explanation about how to interpret it: Exact match, -3% Alignment Penalty.). The degree of similarity is indicated by the match value. Above the match value we can see the "system fields", which keep track of the important administrative information like the creation date. In Word the target field of the current sentence automatically displays the translation suggested by Workbench. The translator is free to adapt this suggestion if required. But here we would like to accept the translation as is; we can confirm it by clicking on "Set/Close" and finish translating the first sentence. Retrieving an exact match from the translation memory can speed up the translation process considerably.

The second sentence is also an exact match, so we can cope with it as we did in the first sentence.

There may also be cases of fuzzy match (i.e. a similar but not identical sentence) and Workbench can calculate its similarity. In the workbench source window any differences between the current sentence from the document and the match found in the translation memory are highlighted using specific colors. For example, grey is used to highlight any additional or missing words. And Workbench will also transfer the suggested translation to the document, but we can see that the background color of a fuzzy match differs from the background color of an exact match, which is to indicate that we need to make a few changes before we confirm the suggested translation. After we have made the necessary changes, we can, like before, click on the "Set/Close" button to save the translation and close the current segment. However we can save time by using the "Set/Close Next Open/Get". Clicking on this button closes the current segment and opens the next.

3.3.4 Updating Translation Memory While Translating

Now we go to the third sentence. First we click on the "Open/Get" button, which means that we order the program to open the third sentence (both the source field and the target field appear) and look up any matches for it in the translation memory, and no match is found, so we have to enter the translation "又或你会听到一种名叫雀鳝的鱼，它的鳔作用和原始肺相似，因此，旱季身埋泥土之时仍然可以生活。" in the target field. At last we click on

"Set/Close", which means that we order the program to store the translation of the third sentence into the translation memory and update it automatically so that we can use the translation just finished in translating all the following sentences.

And the fourth sentence also has no match, so we have to enter the translation "水，一切生命之源，涨落循环不断。" mantually.

In sum, the "Set/Close" button and "Set/Close Next Open/Get" button have the function of updating the translation memory in use while translating.

3.3.5 Looking up Terminology

Workbench might fail to find a match for our translation, but in these cases it still helps us by quickly retrieving terminology information. For example, no match for the fifth sentence could be found. Therefore, the target field in the document remains empty. However, workbench also checks the MultiTerm termbase running in the background.

Figure 3—23. Looking up Terminology

In the source window the terms which have matches in the selected termbase are indicated in a red line. And the terminology window in workbench displays a term found in the selected termbase that is identical to a term that occurs in the current sentence. Thanks to the active "term recognition" feature which have discussed in the part of "setting up Workbench" we do not need to interrupt our translation work to switch to a separate application and start a term search manually.

We start to translate the fifth sentence. At this point the target language equivalent for "During the wet season" needs to be entered. Instead of typing the translation manually, we can directly paste the Chinese term – "湿季", which is displayed in the terminology window, into the document by clicking the "Get Current Term" button. And in workbench source window we can see that the next term "Everglades" is also available in the termbase, as it is highlighted using a thin red line; so we may also paste the target term for "Everglades" easily via the "Get Next Term" button if necessary. Now we can go on editing the term and typing the rest of the translation into the target field: "四月中旬到十二月中旬是湿季，整个大沼泽变成了一条河，虽只几英寸深，但却数英里宽。".

Another powerful button is "Translate to Fuzzy". When this button is clicked, workbench not only saves and closes the current and opens the next segment, but keeps checking the document for 100% matches. If it finds a 100% match it automatically confirms its translation, saves the segment, and opens the next segment until a fuzzy or no match appears.

3.3.6 Populating Termbase While Translating

First of all we need to understand the functions of the buttons in the MultiTerm toolbar.

Figure 3—24. MultiTerm Toolbar

There are nineteen buttons. In turn they are Select Termbase, Toggle Fuzzy Match On/Off, Search Text, Search, Source Index, Reverse Index Fields, Target Index, Require Target Term, Apply Filter, Search All Termbases Sequentially, Maximum Number of Terms in Hit List, Previous Entry, Next Entry, Print Entry, Add Entry, Show Quick Entry Form, Set Selection as Target Term, Batch Print, Log out. And commanding the shortcuts for the frequently used buttons can greatly speed up the translation process.

MultiTerm is delivered with a Word template that allows us to access termbases directly from within Word. For example, we can look up terms and add/edit entries from within Word. And the MultiTerm client application does not need to be running when we use the Word interface.

To enable the buttons in the MultiTerm toolbar we first need to select a termbase by pressing the "Select Termbase" button. To select termbases we click on the + button in the "Open Termbases" window. We can select both local and sever termbases. Here we will just select the local termbase we have just created everglades-national-park-ga2-termbase. Then we click on the termbase name and then confirm with "OK". One of the selected termbases is always the default termbase. This is the termbase to which new entries can be added. All other termbases can only be used for look-up purposes. Currently the "everglades-national-park-ga2-termbase" termbase is the default. If we would like to set another termbase as the default, we click on the termbase name, click on the "Set As Default" button, and at last click on "OK" to confirm the selection in the "Select Termbases" window.

Secondly, we need to toggle fuzzy match on and set the "Maximum Number of Terms in Hit List" as five. To search for a term in the toolbar, we first enter the search term into the "Search Text" box and click the "Search" button. And the "MultiTerm Hit List" window appears, in which we select a term and choose to insert target term, or copy target term to clipboard, or display entry.

Thirdly, if a term is not available in the termbases we can add it to the default termbase by selecting the term and click on the "Show Quick Entry Form" button and the "Add Entry" button. For example, we select the term "flow" in the sixth sentence, set the "Show Quick Entry Form" as active and click the "Add Entry" button. The quick entry dialog "Submit to termbase: everglades-national-park-ga2-termbase" will appear, in which we can enter the target term "流动" manually. We may also choose to enter additional information. At last we click on the "Add" button and the status bar confirms by indicating "Entry added successfully". And we can translate the sixth sentence as "水流极其缓慢，几乎看不到流

动。".

3.3.7 Using the Concordance Search

When we have a 100% match, the translation is automatically inserted. But if no equivalent is found in the translation memory and the recognized terms do not fit into the given context, another powerful Workbench feature may prove helpful: the "concordance" function which allows you to search the translation memory for sentence fragments (i.e. words or expressions). Workbench will display sentences that contain words and expressions that are similar or identical to the search text. In the last sentence we will look up the term "flow". To do this we select "flow" in the document and then click on the "Concordance" button on the Workbench toolbar. The concordance window displays a sentence pair (therefore, it is 1 hit) from the translation memory. And the search text, i.e. "flow", is highlighted in yellow.

We can copy and paste the translation from the target segment in the concordance window into the document if necessary and finish translating the last sentence: "而冬天的几个月则是干季，所有生命的脉搏随之减慢，等待雨水的重新到来。".

3.4 After Translation

Even the best translators are not perfect, so there are usually three activities to be done in the phase of after-translation: internal quality assurance, preparing the translation for delivery, and external quality assurance.

3.4.1 Internal Quality Assurance

Internal quality assurance refers to the checks carried out by the translator or other experts inside the translation company, which is opposed to the external quality assurance performed by the client or a third party commissioned by the client (LingoSystems, 2006).

Translators will first review the translation themselves after finishing the document. And then copy editors, usually professional reviewers or senior translators inside the company, who are in charge of internal quality assurance, will review, word for word, translators' work, verifying the accuracy of the translation, including double checking it against the glossary, or style guidelines developed at project start. Copy editors usually perform a more detailed and stricter review and quality check, and produce QA reports as a feedback to translators.

There are also a number of electronic tools that can facilitate copy editors' work. Spell checkers of Word or the translation memory suite can help catch and correct spelling errors. Workbench can also help review the translation. Workbench keeps the source sentences as hidden text, we can display or hide the hidden source text and compare source to target segments whenever necessary by clicking on the "Show/Hide" button on the normal toolbar of Word. And we can edit the translation of a sentence directly in Word without opening the

segment through Workbench; that is to say, we do not have to use Workbench at all in reviewing. Other useful tools include Beyond Compare, which can compare the original translation with the revised translation and produce a report indicating all the differences between them, SDL Compare, which is similar to Beyond Compare but more powerful, and some features such as find/replace, the thesaurus and the reviewing bar in Microsoft Word.

3.4.2 Preparing the Translation for Delivery

After the internal quality assurance we will need to remove the hidden source text to make it ready for delivery. And when all of these checks are done we should ensure that any amendments are registered in the translation memory; otherwise it is likely that errors stored in the TM will be reproduced when using the TM for future translations. Workbench offers the clean-up function which removes the hidden source text and updates the translation memory with any changes made to the document.

Before we can use the "Clean Up" function we need first to close our translated document in Word. Second, from the "tools" menu of workbench we select the command "Clean Up" to open the "Clean Up Files" window. Third, we need to specify the folder and name for the clean-up log file which is created during the clean-up. Fourth, we specify the document to clean-up by clicking on the "Add" button. Here we select the Word document "everglades-national-park-ga2.doc" which we have just translated and reviewed. After selecting the file we click on "Open" to confirm and to return to the "Clean Up Files" window. Fifth, we select the "Update TM" option which ensures that workbench will look for any changes made to the document during the review and take them over into the translation memory. And finally, we click on the "Clean Up" button to start the process.

When the process bar indicates that the clean-up has finished, the "Clean Up Files" window shows how many sentences have been cleaned and updated (i.e. entries in the translation memory that were updated on the basis of any changes made during review). We can now close the "Clean Up Files" window. The translation is as follows:

美国大沼泽国家公园的沼泽地，生物适应性独特，脆弱的生态平衡维持着众多生物的生命；在这些方面，尚有诸多有待了解。你可能看到树枝上挂着白色的卵囊，小苹果蜗牛就快孵出来了。而苹果蜗牛又是另一种濒危动物蜗牛鸳的主要食物；蜗牛鸳的喙很特别，可以把苹果蜗牛从壳里钩出来。又或你会听到一种名叫雀鳝的鱼，它的鳔作用和原始肺相似，因此，旱季身埋泥土之时仍然可以生活。水，一切生命之源，涨落循环不断。四月中旬到十二月中旬是湿季，整个大沼泽变成了一条河，虽只几英寸深，但却数英里宽。水流极其缓慢，几乎看不到流动。而冬天的几个月则是干季，所有生命的脉搏随之减慢，等待雨水的重新到来。(Translated by the author)

3.4.3 External Quality Assurance

External quality assurance refers to the checks performed by the expert of the client or a third party commissioned by the client, and external quality assurance differs greatly from internal quality assurance. The proofreader, who is in charge of external quality assurance and should be familiar with the product, examines the copy-edited version on a "stand-alone" basis for correctness, consistency, proper format and flow of the language, and provides a report as a feedback to the translation company. And the proofreader may also evaluate the translation against the cultural and linguistic elements of the target language country.

The actual activities involved in the after-translation phase may be different from our description in which different experts – the translator, the copy editor, and the proofreader – are in charge of different checks to maximize the translation quality. But the key is that the translation company should be flexible in assembling a translation team that best satisfies the client's budget, timeline, and quality requirements (LingoSystems, 2006).

3.5 Pedagogical Guidelines

Comparatively, translation technology is new. For example, the first MultiTerm for Windows was developed in 1992, and the first Translator's Workbench for Windows in 1994 (Wassmer, 2008). But Trados soon gained a huge success, and many important software companies like Microsoft and the major translation/localization companies adopted the Trados suite to assist their translation/localization. Nowadays the popularity of Trados continues to increase among both translators and companies. Correspondingly, translation technology teaching is also a new topic both at home and abroad. Some translation teachers teach translation technology as one optional component of the traditional translation course, some teach it as an essential component of the translation course, some teach it as an independent course, and others teach it as several independent courses. There are also schools that establish the specialty of translation technology in both western countries and China. In consideration of the current typical situation of translation teaching in China, the thesis regards translation technology as one essential component of the translation course which can be integrated into the existing translation course systematically. In this section we would like to explore the pedagogy of translation technology tentatively from the perspective of the integration between translation teaching and translation technology and task-based learning.

3.5.1 Orientation

Chung-ling Shih (2006) proposes two tracks of translation memory teaching: the use of translation memory tools to teach translation and the learning of translation memory skills. On the basis of her distinction we can go further and make the distinction between the use of translation technology to teach translation and the learning of the skills of using translation

technology. This distinction helps us determine the orientation in teaching different types of electronic tools for translators.

In teaching translation memory, the teacher should first focus on teaching the skills of using translation memory in consideration of the sophistication of the usage of the translation memory systems. But these two tracks of translation memory teaching are not mutually exclusive; after students have commanded the essential operations of the Trados suite, the teacher may also try to use the translation memory systems to teach translations skills. In sum the teacher should put the orientation on different tracks in different phases of the teaching process.

3.5.2 Classroom Environment

It is recommended to teach translation memory systems in a PC (personal computer) lab where each student works on one PC. The teacher's computer will be used to present the work prepared by one of the students. Based on the student's work, the teacher can make corrections and the class can discuss and give more input for discussion. And students will be able to directly edit their translations, local translation memories and terminology databases in class. So in this scenario all students have the chance to work with a computer and make themselves familiar with the software, its functionalities, etc. But the disadvantage of this scenario is the high costs for the institution resulting from acquiring hardware and software. And there is also the risk that the traditional interaction of teacher-students becomes that of students-computers. But this can be overcome by the installation of classroom management software which allows teachers to view or lock or display the students' screens from their machine.

Although teaching the translation memory system in a PC lab is recommended, we may also implement the teaching in other environments such as teaching in a PC lab where several students work on one PC, and teaching in a traditional classroom with only one computer where students work individually or in groups. But in these two scenarios students may not obtain enough opportunities to practice using the Trados suite.

3.5.3 Integration

The thesis focuses on the systematic integration of translation technology into translation teaching because it is believed that the relationship between translation technology and translation teaching is that they are complementary with each other. Integrating translation technology into translation teaching does not mean that we turn our focus from the conventional teaching contents to the usage of electronic translation tools. On the contrary, we still focus on the conventional teaching contents like translation skills, translating various types of texts, but we now use the electronic translation tools like translation memory suites to translate the same texts because we would like our students to benefit from the features of

translation tools in both translation quality and efficiency, and because we would like our students to learn the usage of the tools so that they are able to meet the challenge of social informationization. Fang Mengzhi's translators' competence model, which we have examined in 2.1, demonstrates well such a relationship between translation technology and translation teaching: translator competence = language proficiency (both Chinese and English) + the translator's specialty + the ability to use translation technology.

Since translation technology is added into the teaching contents, we also need to adjust the teaching time arrangement correspondingly. First, the usage of the Trados suite should be taught at the beginning of the translation course so that the students can practice using the tools throughout the course. Second, the traditional translation course usually begins with the introduction to the fundamental concepts and theories of translation like the definition of translation and the process of translation, so translation teachers can teach the Trados suite at the same period of time, and complete teaching the essential operations of the Trados suite when the lectures on the fundamental concepts and theories of translation are finished because mastering the basic usage of the Trados suite can be achieved in a relatively short time through intensive training. Third, the integrated teaching may take the following form: every translation class usually has two periods, so one period can be arranged to teach the fundamental concepts and theories of translation and the other to teach the usage of the Trados suite by finishing the translation tasks the teacher has selected which are relevant to the lecture in the first period. Fourth, the Trados suite should be used in all translation tasks throughout the course so that the students can become more and more familiar with its functions and operations.

3.5.4 Task Design

The operations of the Trados suite are complicated compared with the operations we will examine in the next chapter, and the Trados suite does not seem useful without translation units or terms, or with few in translation memory databases or termbases. So the translation tasks used in teaching translation memory suites need special design and the teacher may need to make good preparations by collecting data relevant to the translation tasks used in the course. Unlike machine translation, the translation memory suite will do nothing for the translator except reserving the format of the source text in the target text if the translation memory or termbase is empty, which, at first sight, may be regarded as useless by the learners. So in order to arouse the learners' interest in translation memory systems the teacher may need to find and provide students with translation memory databases and termbases which contain translation units and terms which are useful in doing the translation task. The teacher may also encourage the learners to search and find resources and the whole class may be able to build a large translation memory database and termbase collaboratively.

The teacher may design a large translation project which is similar to the translation

projects in large-scale translation companies as the project of the course, for example asking students to translate the website – eCoLoRe (E-content Localization Resources for Translators http://ecolore.leeds.ac.uk), which is developed and designed by several European universities with the purpose of providing teachers and students of translation specialty with e-content localization training materials (Lu, 2008).

This is a multilingual website, including the major European languages and Japanese, but it does not have a Chinese version. The website's theme is e-content localization which is also the topic we focus on, its design is standards-compliant, and its length is appropriate, so it is proper to use the website as the translation project of the course. After learning the basic operations of the Trados suite, the teacher may designate each student a role such as a translator or a project manager and assign his/her translation task in the project. In the translation project, every student should finish translating a certain number of pages (the number of pages each student should translate is determined by the total number of the pages of the site and the number of the students in the class). And in doing the project, students can practice the skills they have learned in class and feel the conveniences translation technology brings; they can also learn new knowledge concerning e-content localization. After the project is finished, the Chinese version of the website may also be published at free cyberspace on the Internet.

3.5.5 Task-Based Learning Implementation

Our goal is to offer high-quality translation classes which are closer to real working scenarios, so we also need to think about the implementation of task-based learning. The teacher may first of all introduce the task and demonstrate the operations so that students can get certain perceptual understanding and learn how to do the job. Secondly, the teacher may explain the major concepts and principles involved in the task so that students can get certain rational understanding and learn the picture behind the operation. Thirdly, the teacher may also point out the potential unexpected situation in the operations. And at last, practice in class and homework related to what is learnt in class should be assigned so that students can get enough opportunities to consolidate what they have just learnt.

And after translation technology is added into translation teaching – and particularly when we work with technology and computers – it is important to stress that not everything is best done electronically (Pym, 2006). There are certain activities that are better done when teacher and students look beyond computers and look at each other. This is the case, for example, when carrying out analysis of group work, discussing, suggesting and making decisions about translation alternatives.

Chapter 4.Translation Teaching – Integrating the Minor Electronic Tools for Translators

This chapter discusses the integration of the minor electronic tools for translators into translation teaching. It begins with an introduction in which the following general questions are discussed – why professional translators need to have a basic understanding of machine translation though its output is unsatisfactory at present, why electronic reference materials are essential in translation, and what the relationship between "electronic tools" and "electronic resources" is. Then the usage of the minor electronic tools – machine translation systems, electronic dictionaries, electronic encyclopedias, corpora, and search engines respectively – is demonstrated. And in the last section a brief discussion on the pedagogical guidelines of teaching these tools is presented.

4.1 Introduction

The first translation tool introduced in this chapter is machine translation (MT) systems. Machine translation systems are another type of software specially developed for translation. But because the output of machine translation systems is generally unsatisfactory at present, average professional translators usually use the translation produced by machine translation systems as a draft or reference. But no one can deny that it is machine translation that gives people the prospect that the problem of translation can be solved once for all some day. So translators also need to have a basic understanding of the aspects of machine translation.

The major part of the chapter focuses on the electronic resources that are useful in translation, including electronic dictionaries, electronic encyclopedias, corpora, and World Wide Web. All translators know that reference books are essential in translation, and consequently when translators translate texts on computer, which is the typical situation now, electronic reference materials also become essential. One difference is that the information provided by electronic resources is much more than that provided by paper reference books. But have we ever considered why reference materials are so important for translators? Firth's semantic theory may provide us with a satisfactory answer. Translation is translating meaning. But what is meaning? Firth holds that meaning is use, and thus he defines meaning as the relationship between an element at any level and its context on that level, specifically including the phonological level, the lexical and semantic level, the grammatical level, and the situational level; in other words, meaning is determined by context which can be generally

divided into two types: linguistic context and situational context (Hu, 2001). Firth himself acknowledges that it is difficult to determine all the factors that make up a situation, but by the term situational context, Firth refers to a series of contexts of situation, each smaller one being embedded into a larger, to the extent that all the contexts of situation play essential parts in the whole of the context of culture (Hu, 2001). So when we translate, it is true that we are looking at the word, the phrase, the sentence, the paragraph, and the text in the source language, it is also true that we are considering the linguistic context and situational context of these linguistic units in order to grasp the meaning contained in these linguistic forms accurately and considering how to reproduce the meaning accurately in the target language. But context, especially situational context, is so complicated that it is far beyond any single translator' knowledge scope. So translators need to consult reference materials constantly to improve their understanding of context and meaning. Furthermore, reference materials can also help translators select the proper word in the proper place in the target language by providing translators with various choices. In sum, both understanding (reception) and expression (production) in translation depend on translators' knowledge, imagination and experiences; and electronic resources can greatly expand translators' knowledge, arouse their imagination and enrich their experiences, providing translators a good source of finding out the keys to the locks they meet with in the process of translation.

We may also need to pay attention to the relationship between "electronic resources" and "electronic tools". By resources we refer to the data that is useful to translation, like electronic dictionaries (resources, data, information, reference materials, and reference books are used interchangeably in this thesis); by tools we refer to the software that is used in translation, like machine translation software and translation memory software (tools, software, and programs are used interchangeably in this thesis). But the distinction between resources and tools is not clear-cut because data is usually contained in a certain file format and certain programs are used to read and process data in that particular format. For example, the electronic dictionary – Kingsoft Powerword is generally regarded as a resource from the perspective of a translator because we are mainly concerned with the data (i.e. the dictionaries and the items in the dictionaries) contained in it, but we should not forget that Kingsoft Powerword itself is software which helps us read and process dictionaries and the information contained in the dictionaries (i.e. data). The website of Kingsoft Powerword (http://www.iciba.com) is generally regarded as a resource because it provides a web interface in which we can look up words and phrases, but we should also notice that it is the programs and databases running on the server side which are invisible to us that enable us to make such retrievals. So data and software are inseparable from each other, and that is why although the major part of the chapter discusses electronic resources it is still proper to use the term "tools" in the title of the chapter.

4.2 Machine Translation

This section consists of two parts; the first part presents an overview of machine translation, and the second part demonstrates the usage of Google Translate through a specific translation task.

4.2.1 Overview

Machine translation is the attempt to automate all or part of the process of translating from one language to another (Austermühl, 2006). It is generally considered that machine translation originates from the Weaver Memorandum of 1949 (Austermühl, 2006), and afterwards its development experiences significant ups and downs. And at present machine translation studies and products flourish and machine translation becomes an important topic socially, politically, commercially, scientifically, and philosophically.

Machine translation systems can be divided into different categories according to different criteria. According to the environment in which machine translation systems are used, they can be divided into three types: low-end machine translation systems whose target clients are individuals, tailored high-end machine translation systems whose target clients are companies, and Internet-based machine translation systems which are accessible via the Internet (Austermühl, 2006). And according to the technologies machine translation systems use, they can be divided into the following five types (Feng, 2004).

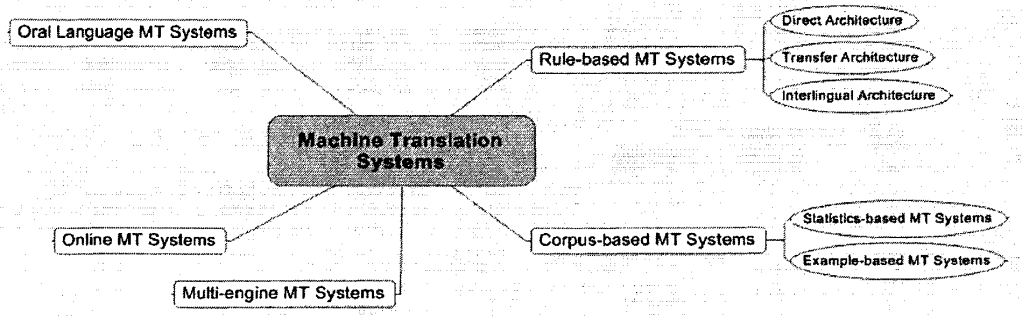


Figure 4—1. Five Types of Machine Translation Systems According to Technologies Used

As have been said, the output of machine translation is generally unsatisfactory because of such problems as ambiguity, syntactic complexity, idioms, and anaphora resolution. So some people think that machine translation systems are useless for translators. This is a misconception. The process of translating a document is generally divided into two stages: the first stage is to produce a draft translation, and the second stage is to revise the draft translation in order to produce a translation that is up to standard required. In most cases the aim of using machine translation is only to automate the first stage – producing a draft translation.

Besides, there are also several ways of improving the quality of machine translation

output. The strategies for optimizing quality are listed in the following table (Austermühl, 2006).

Measure	Human Involvement		
Stage	Before the translation process	During the translation process	After the translation process
Dictionary updating	V		
Pre-editing	V		
Controlled language	V		
Interactive mode		V	
Post-editing			V

Table 4—1. Strategies for Optimizing Machine Translation Quality

These measures do not exclude each other; they can be applied at the same time. Pre-editing and post-editing apply to the input and output texts, whereas the other measures influence the working of the program itself. Among these measures the most commonly used one is post-editing.

4.2.2 Case Study

At present the popular machine translation systems in China are Google Translate, Kingsoft FastAIT, and Systran. Here we are going to show how to use Google Translate to translate the following sentences and how to edit its output:

> Ubuntu is a community developed operating system that is perfect for laptops, desktops and servers. Whether you use it at home, at school or at work Ubuntu contains all the applications you'll ever need, from word processing and email applications, to web server software and programming tools. (Ubuntu, 2008)

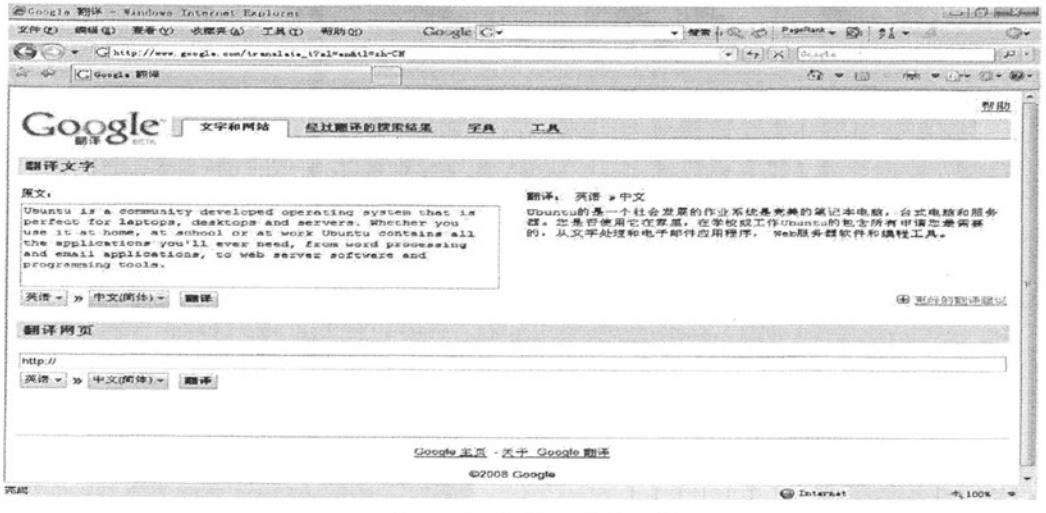


Figure 4—2. Google Translate

Google Translate is easy to use. We first open the address

http://www.google.com/translate_t in a browser, copy and paste the text above into the box of source text, adjust the direction of translation, click on the "Translate" button, and the output appears.

> Ubuntu 的是一个社会发展的作业系统是完美的笔记本电脑，台式电脑和服务器。您是否使用它在家里，在学校或工作 Ubuntu 的包含所有申请您最需要的，从文字处理和电子邮件应用程序， Web 服务器软件和编程工具。

Then we can begin to edit the output by comparing the source text and the translation, which proves to be the main part of the translation task.

In the first sentence there are two major problems: "community developed" and "perfect for". Here the translation engine of Google Translate understands "community developed" as "社会发展的"; the correct translation should be "(开源)社区开发的", so we can edit the first part of the sentence as "乌班图（Ubuntu）是社区开发的操作系统，". And "perfect for" here means "highly suitable for somebody/something; exactly right for somebody/something", not "without fault; excellent", so we can edit the second part of the first sentence as "适合运行于笔记本、台式机和服务器。".

And there are also two main problems in the translation of the second sentence: "whether" and "applications". In this sentence the translation of "whether" should be "无论", not "是否", and the translation of "applications" should be "应用程序", not "申请"; so the first part of the sentence can be revised as "无论在家庭、学校还是工作环境使用，乌班图（Ubuntu）都提供了您所需的各种应用程序，". And the translation of the second part does not need dramatic revision, so we can polish it as "从文字处理、电子邮件程序到服务器软件、编程工具。".

After editing the translation looks like the following:

> 乌班图（Ubuntu）是开源社区开发的操作系统，适合运行于笔记本、台式机和服务器。无论在家庭、学校还是工作环境使用，乌班图（Ubuntu）都提供了您所需的各种应用程序，从文字处理、电子邮件程序到服务器软件、编程工具。(Translated by Ubuntu Community, adapted by the author)(Ubuntu, 2008)

Comparing the output of Google Translate and the revised translation, we can see that the output of machine translation usually needs dramatic revision to reach professional quality. But the strong point of machine translation is translating texts in a particular domain and in a controlled language.

4.3 Electronic Dictionary

This section consists of two parts; the first part presents an overview of electronic dictionaries, and the second part demonstrates the usage of Kingsoft Powerword through a specific translation task.

4.3.1 Overview

A dictionary is a reference book that lists words in order and gives their meanings, and electronic dictionaries refer to the software that contains all the information of dictionaries from various publishers and provides an interface for users to retrieve information on words and expressions from internal dictionaries (Dictionary, 2008). In addition to its basic function of defining words, a dictionary may provide information about their pronunciation, grammatical forms and functions, etymologies, syntactic peculiarities, variant spellings, and antonyms. A dictionary may also provide quotations illustrating a word's use. The assembling of relevant words into groups by some principle, such as by their meanings, can be done, and such a work is often called a thesaurus which is particularly useful for translators.

Electronic dictionaries can be divided into different categories according to different criteria. According to the language(s) involved, electronic dictionaries can be divided into monolingual dictionaries and bilingual or multilingual dictionaries. A monolingual dictionary has both the word list and the explanations in the same language, whereas bilingual or multilingual dictionaries have the explanations in another language or different languages. According to the domain and purpose, dictionaries can be divided into general-purpose dictionaries and specialized dictionaries. General-purpose dictionaries collect words and expressions for everyday use, whose target audience is the general public. And specialized dictionaries collect words and expressions of a particular topic, so they are specially designed for a particular group of people. And according to the position and medium dictionaries can be divided into CD-ROM dictionaries, desktop dictionaries, and online dictionaries. CD-ROM dictionaries are stored on CD-ROM, desktop dictionaries on hard drive, and online dictionaries on the Internet. At present most people use desktop dictionaries which have the ability to connect to the Internet and retrieve online information. And desktop dictionaries usually have the popular feature of screen translation, that is, when we point the cursor to a word or phrase, the translation of the word or phrase pops up in a new window.

Electronic reference books are usually easy to use and provide more information than paper reference books. If translators are able to consult the electronic reference books skillfully we will probably get our problems solved more efficiently.

4.3.2 Case Study

There are many electronic desktop dictionaries available, among which Kingsoft Powerword, Youdao, Stardic, DocEye, Bybalon are the most popular ones. And online dictionaries are even more in number. In this section we choose to demonstrate the usage of Kingsoft Powerword. Kingsoft Powerword is multi-lingual translation dictionary software, which was first released in 1997 and now is one of the most widely used translation dictionary software in China (Kingsoft, 2008).

We will demonstrate the use of Powerword to translate the following English text:

The sun is warm now, the water of the river undisturbed. Seagulls teeter on the parapet in front of her, boats go by. The line of trees that breaks the monotony of the pavement is laden with leaves in shades of russet. Figures stride purposefully on a distant bridge, figures in miniature, creatures that could be unreal. (Qiao, 2002)

First we start Powerword, activate the feature of screen translation, and then we can begin to translate the sentences above.

We do not meet with a new word in the first sentence and translate it as "阳光正暖，江面水波不兴。". For the second sentence we may find that "teeter" and "parapet" are the words we are not familiar with; at this moment we can point the cursor to the word and click, and then a pop-up window appears, displaying the information about the word which is provided by the dictionaries we have selected as dictionaries for

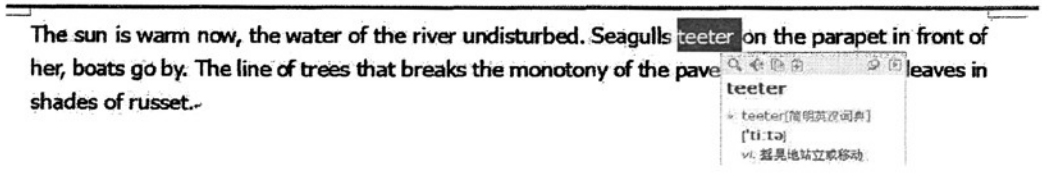


Figure 4—3. Kingsoft Powerword Popup Window

screen translation. From this pop-up window we can know that the "teeter" means "摇晃的站立或移动". Here understanding the function of the buttons on the pop-up window may help us use the feature. The first button means looking up the word in more dictionaries; the second playing the word's pronunciation; the third copying all the contents of the window; the fourth adding the word to the new-word notebook which is another tool of Powerword to help users to improve their vocabulary ability; the fifth fixing the pop-up window on the top of desktop; and the sixth providing options such as software configuration, dictionary management.

As for the second new word "parapet", the pop-up window displays the following message: the definition of the word is not found in the dictionaries for screen translation and we suggest that you look it up in all the dictionaries. In Powerword, dictionaries are divided into two types: online dictionaries and local dictionaries which can be subdivided into dictionaries for screen translation and look-up dictionaries. The reason why this situation occurs is that the dictionaries for screen translation do not have the definition of "parapet". Under this situation we may click on the first button on the pop-up window – looking up the word in more dictionaries including the look-up dictionaries and online dictionaries (to use online dictionaries a connection to the Internet is needed), and the main window of Powerword appears displaying the information found as shown in the picture below.

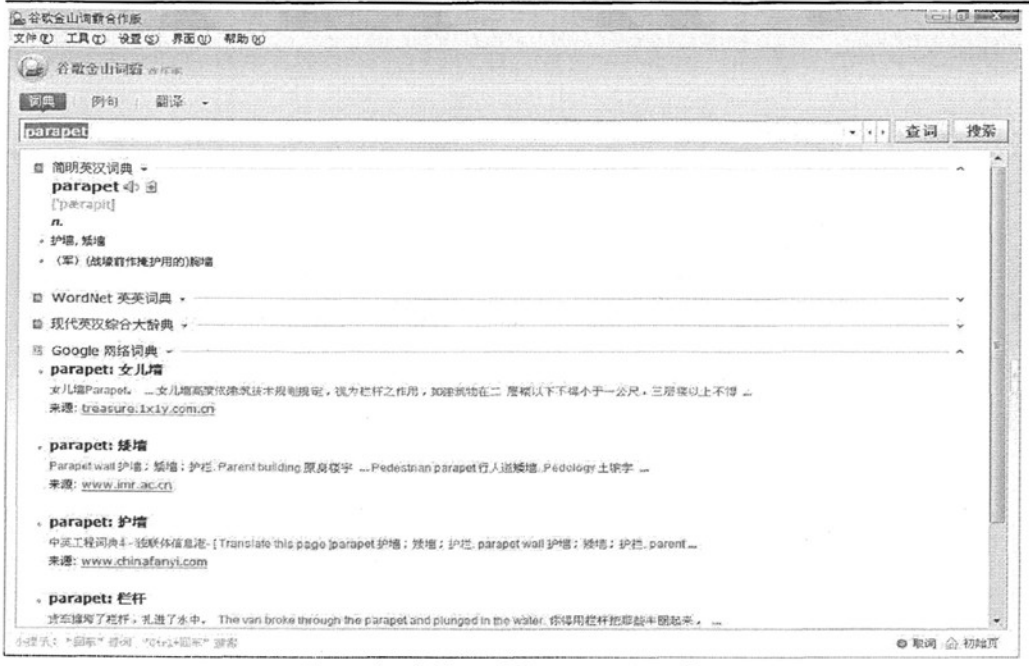


Figure 4—4. Kingsoft Powerword Interface

From this picture we can see that we have found much more information from a number of dictionaries. Since the information cannot be displayed within one screen, we can use the scrollbar or the roll-up button to roll up the information. So we can translate the second sentence as "海鸥在她面前的护墙上摇摇摆摆地走着，船只从她身边驶过。".We can look up all the words we do not know in the same way, and translate the source text as the following:

> 阳光正暖，江面水波不兴。海鸥在她面前的护墙上摇摇摆摆地走着，船只从她身边驶过。一行树木打破了人行道的单调，树上长满了深浅不一的黄褐色树叶。远方桥上的行人正心无旁骛，大踏步地向前走着，那些小人儿细细点点的，看上去影影绰绰、似真似幻。(Translated by Ke Ping) (Qiao, 2008)

4.4 Electronic Encyclopedia

This section consists of two parts; the first part presents an overview of electronic encyclopedias, and the second part demonstrates the usage of *2008 Encyclopedia Britannica Ultimate DVD-ROM* through a specific translation task.

4.4.1 Overview

An encyclopedia is a reference work that contains information on all branches of knowledge or that treats a particular branch of knowledge in a comprehensive manner (Encyclopedia, 2008). The basic difference between an encyclopedia and a dictionary is that an encyclopedia explains things while a dictionary explains words; but it is actually difficult

to distinguish the two. So in the thesis the term encyclopedia includes all generally recognized encyclopedias as well as all works that provide in an orderly arrangement the essence of "all that is known" on a subject or a group of subjects. Consequently encyclopedias can be divided into two types: general encyclopedias and specialized encyclopedias.

Now many encyclopedia publishers are exploiting new technologies in the field of information storage, retrieval, and distribution to publish electronic encyclopedias either as CD-ROM (compact disc read-only memory) and DVD-ROM (digital versatile disc read-only memory) products or as online services. Consequently electronic encyclopedias can be divided into two types according to the medium: CD-ROM or DVD-ROM encyclopedias and online encyclopedias. And these electronic encyclopedias are more than electronic versions of the print sets because of the features that print encyclopedias do not possess. One such feature is that electronic encyclopedias offer many more articles. And these articles are more accessible because they can be retrieved exhaustively through search software besides through the traditional alphabetical indexes. Another such feature is the multimedia capabilities. Electronic encyclopedias provide animated graphics, recorded sound, and video recordings to supplement the text, photographs, and line drawings inherited from the print medium.

4.4.2 Case Study

There are some electronic encyclopedias available, most of which are monolingual. But monolingual encyclopedia can also be useful for translators because they explain things and thus expand translators' world knowledge as well as specialized knowledge.

At present the well-known encyclopedias in China are Encyclopedia Britannica, Microsoft Encarta, Wikipedia, Encyclopedia of China, and Baidu Baike (http://baike.baidu.com). Here we choose to demonstrate the use of *2008 Encyclopedia Britannica Ultimate DVD-ROM* – one of the most authoritative encyclopedias in the world – to translate the following sentence:

《韩非子》一书，重点宣扬了韩非法、术、势相结合的法治理论。(Zhang & Wang, 2008)

The structure of this sentence is simple, but three words – "法、术、势" are difficult to translate because these words are terms from Hanfeizi's political thought. In order to translate these terms accurately we may look Hanfeizi up in Encyclopedia Britannia in the hope that we can find the authoritative translation of the terms.

The encyclopedia is easy to use. We first launch the program, enter "Hanfeizi" in the search box, and click on the "Search" button. In seconds the search results appear in which there is one article named Han Fei (Chinese philosophy); we click on the title and the article appears. This article provides a lot of information on Hanfeizi, including an introduction, his life, and his political thought. In the part of "Political thought" we can find the following three sentences: "Whatever the ruler's moral qualities and however he rules, possession of authority

(*shi*) carries the inalienable right to exact obedience.", "Authority should be wielded not whimsically but through laws (*fa*) that the ruler promulgates and that all must obey.", and "To ensure an effective bureaucracy and to protect his authority from encroachment or usurpation, the ruler must make use of *shu* ("administrative techniques" or "statecraft")." After reading these three sentences we are sure that "法、术、势" can be translated as "laws, statecraft, and authority".

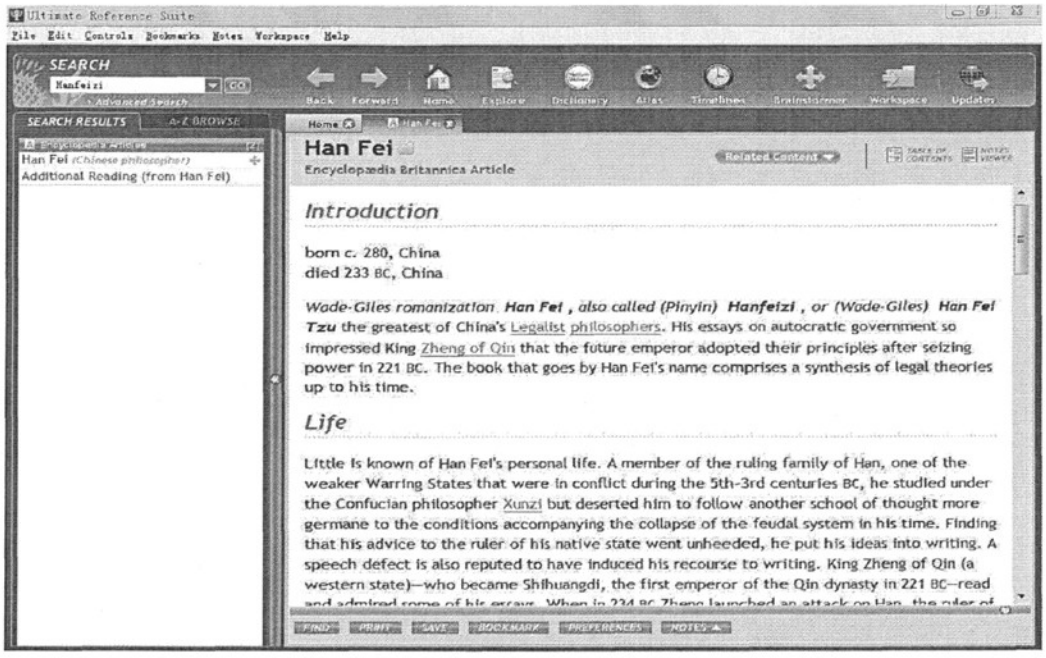


Figure 4—5. 2008 Encyclopedia Britannica Ultimate DVD-ROM

So we may translate the Chinese sentence as follows:

> The book *Hanfeizi* advocates the theory of law-based ruling which combines laws, statecraft, and authority together. (Translated by the author)

4.5 Corpus

This section consists of two parts; the first part presents an overview of corpora, and the second part demonstrates the usage of BYU-BNC (Brigham Young University – British National Corpus) through a specific translation task.

4.5.1 Overview

Corpora can be defined as collections of texts selected according to specific criteria, which are usually stored on computers (Meyer, 2002). Because the texts are usually electronic data, it is possible to analyze corpora and retrieve examples of particular words very quickly. And corpus linguistics is the study of corpora and their application in linguistic studies. We may think that corpus linguistics is another paradigm of linguistics, but if we examine the

types of linguistic analyses corpus linguists conduct, we can find out that corpus linguistics is more a way of doing linguistic research than a separate paradigm within linguistics. Since corpus linguistics is basically a method and corpora are basically tools, corpora can be used in various fields of linguistics such as grammatical studies of specific linguistic structure, compilation of reference grammar, lexicography, language variation, historical linguistics, natural language processing, language acquisition, language pedagogy, contrastive analysis of two languages, and translation. Here we will focus on the use of corpora in translation practice.

Generally translators need to fully understand the source text and produce a quality translation. And at present translators are also concerned with the efficiency of doing these things – how many words they can translate per hour, which decides how much money they can earn per hour. And in the long run, translators must learn from translation practice to improve their translation competence. If we use corpora in translation we can find out that corpora can help us in all these aspects – reception, production, efficiency improvement, and competence improvement.

Depending on our needs we may make use of various types of corpora. We may use general corpora (that is, reference corpora, balanced corpora) which contain various kinds of texts for all kinds of users; we may also use specialized corpora which contain texts selected for a particular purpose. We may use monolingual corpora which contain texts in a single language; we may also use multilingual corpora which contain texts in two or more languages. And multilingual corpora can be further divided into parallel corpora which contain texts in the source language and their translations and comparable corpora which contain comparable texts in two or more languages.

4.5.2 Case Study

There are many corpora compiled by various organizations at present, but most of them are not freely accessible. So it is not easy to find a good corpus we can use freely; here the author recommends four corpora which are very useful for translators: WebCorp: The Web as Corpus (http://www.webcorp.org.uk/), BYU-BNC (Brigham Young University – British National Corpus) (http://corpus.byu.edu/bnc/x.asp), Corpus of American English (http://www.americancorpus.org/), and The PolyU Language Bank (http://langbank.engl.polyu.edu.hk/indexl.html). WebCorp is a suite of tools which allows access to the World Wide Web as a corpus – a large collection of texts from which facts about the language can be extracted. And the second and third are authoritative English corpora; the fourth is a multilingual corpus. Here we choose to demonstrate the use of BYU-BNC – one of the most authoritative English corpora in the world – to translate the following English text:

To the citizens of the United States of America

In the light of your failure to elect a competent President of the USA and thus to

govern yourselves, we hereby give notice of the revocation of your independence, effective today. (Cleese, 2005)

After seeing the sentence we may think about some general questions about it: what the purpose of this writing is, what its style is, and what type of text it is. Actually these three questions are inter-connected. Obviously the situation described in the writing is imaginary, but it does reflect something in reality. This writing tries to pretend to be an official decree issued by the British government, because it uses such words as "hereby" and "revocation" and such segments as "to the citizens of the United States" and "effective today" which are typical in such type of texts. So the style of text is very formal, but since it describes a situation which everyone knows is impossible to take place, the frozen style actually produces the effect of funniness. And through such style and effect it reflects some European people's attitude towards the United States.

Now we have a close look at the sentence. We may first find out the potentially problematic words in translation: "in the light of", "competent", "hereby", "give notice of", and "revocation". Among these words some may simply be expressions whose meaning we do not know, such as "hereby", which can be solved by looking them up in a good dictionary; some are difficult to translate because it is difficult to find a Chinese equivalent which can be put at the place the original English word occupies and which can collocate with the words around properly, such as "competent", which can be solved by employing proper translation skills; and others are of a different kind, such as "revocation of". "Part of our knowledge of a word is that it is used in certain kinds of combination in certain kinds of texts." (Hoey, 2004: 23) But very often we lack and average dictionaries and reference works can not provide this knowledge which is essential for us to obtain the implied meaning of the key words; this is just where corpus can help us. Here we will see how BYU-BNC can help deepen our understanding of the expression "revocation of".

We first open the homepage of BYU-BNC (http://corpus.byu.edu/bnc/x.asp), enter the word "revocation of" and click on the "SEARCH" button. As a result we will see all the occurrences of "revocation of" in the BYU-BNC which can be called a concordance. These occurrences can be sorted according to frequency; and an item in the concordance is called a hit. From the concordance we can see those words which frequently occurs in conjunction with "revocation of"; such words are called collocates of "revocation of", which may be defined as a word occurring within three words to the left or right of the search word. And the search word and its collocate form a collocation.

From the concordance we may examine the collocates following "revocation of": order, newspaper licenses, licenses for the pub, a certificate of, what is obliterated, an objective regime, a parole license, the care order, an authorization, the authority, the patent, the settlement, the concessions, his offer, the Constitution, the annulment, laws, Fatah official's

citizenship, that permission, committals, the agreement, the guarantee, recognition. These collocates suggest that "revocation of" has a semantic preference, which means tendency for the search word to be followed by expressions which have similar meanings, for official permits of various kinds. So it seems that things that get revoked are usually legal acts, and particularly permits and concessions.

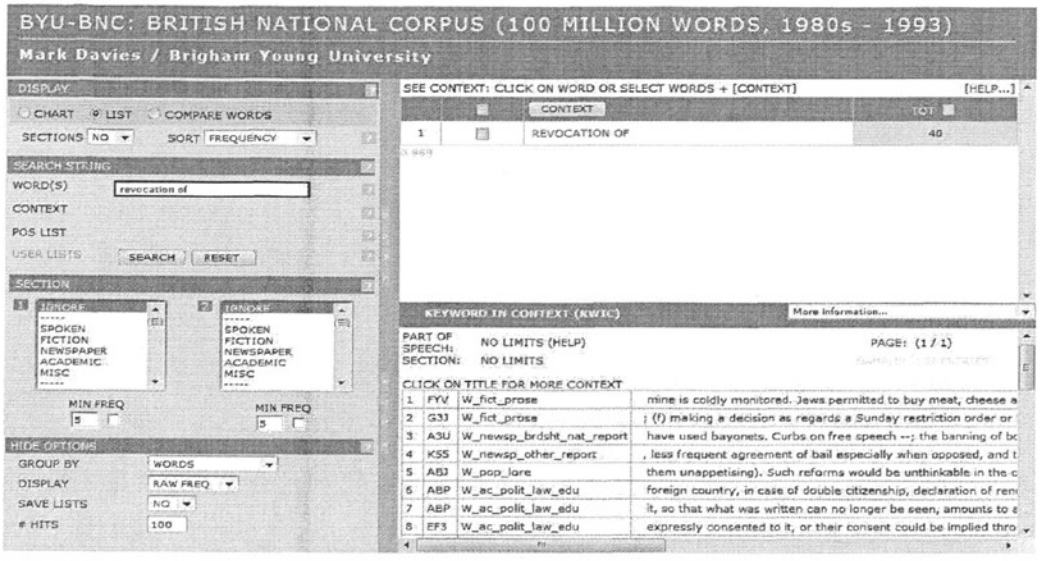


Figure 4—6. Brigham Young University – British National Corpus

So the word "revocation" in the source text implies that the independence of the United States is a permit or concession of the British government, not a victory of the Americans. So perhaps we should translate "revocation" with an expression which has similar associations with permission or concession. The Chinese word "废止" may be the proper translation. So the sentence can be translated as the following:

致美利坚合众国公民:

鉴于你们未能选出一位合法的美国总统并以此自治，故此我们宣告废止美利坚之独立，即日生效。(Translated by the author)

4.6 Search Engine

This section consists of two parts; the first part presents an overview of search engines, and the second part demonstrates the usage of Google through a specific translation task.

4.6.1 Overview

Search engines are computer programs to find answers to queries in a collection of information which is commonly the World Wide Web but can also be a database or a library catalog or our local computer (Search engine, 2008). In this thesis the term search engine refers to Web search engines like Google and Baidu. The Web is basically unorganized, and

the information on the Web is of greatly varying quality; so we need search engines to help us locate the high quality information we need. When we make a query, a Web search engine produces a list of pages containing the terms in the query.

Search engines uses crawlers – programs that explore the Web by following hypertext links from page to page, recording everything on a page (known as caching) or parts of a page, together with some proprietary method of labeling content and building weighted indexes (Search engine, 2008). These proprietary methods of weighting or ranking Web pages may include calculating the number of other pages that refer to a page, identifying authoritative pages to which many pages refer, and identifying hubs that refer to many pages. These techniques can work well, but we still need to exercise skills in choosing proper combinations of search terms. We may join terms with such operators as "and", "or", and "not" to refine query results. We may also search specifically for images or for files in a certain format or for pages in a certain language like Chinese or for pages in a certain country.

Another search tool is a directory which organizes information on the Web according to a human-developed hierarchical classification.

4.6.2 Case Study

There are many search engines available, among which Google and Baidu are the most popular in China. Here we choose to demonstrate the usage of Google – the most popular search engine in the world – to translate the following English text:

> If a letter or other writing containing a late acceptance shows that it has been sent in such circumstances that if its transmission had been normal it would have reached the offeror in due time, the late acceptance is effective as an acceptance unless, without delay, the offeror orally informs the offeree that he considers his offer as having lapsed or dispatches a notice to that effect. (Chen, 2007)

This is a legal text, so it contains some terms of law, such as "a late acceptance", "offeror", "offeree", and "offer". In order to translate the text we need first to translate these terms.

We will first look up "offeror", "offeree", and "offer". We open the homepage of Google (www.google.cn), type in the following words "offer offeror offeree 法律", check the option "中文网页", and click on the "Search" button. Here there are two points we should pay attention to: one is that we should type in the Chinese word "法律" so that the information provided by Google are relevant to law, and the other is that we should check the option "中文网页" so that we can find, if any, the Chinese translation of these English terms.

Figure 4—7. Google Search

The search engine gives us many results. We open the first result and find the following information: "表明经受要约人承诺，要约人即受该意思表示约束" and its two translations "Once the offeree accepts the offer, the offerer shall be bound by the offer" (the first translation) and "The proposal in question shall indicate that the offeror shall be bound by the offer in question in case the offer is accepted by the offeree thereto" (the revised translation) (http://www.flrchina.com/html/le/paper/trans/2006/10/395_2.html). According to the information above we can translate these three words as "要约", "要约人", "受要约人". And according to the introduction to the author of the article who is an associate professor and expert in legal English, we can be sure that the translation is creditable.

We may find the translation of "a late acceptance" in the same way. We enter the key words "a late acceptance 法律" and click on the search button. In the first result given by Google we find the following information: 接下来一个问题是，是不是承诺只要超过了有效期，就一定无效呢？公约规定即使是逾期的承诺（A LATE ACCEPTANCE），在以下三种情况下也应视为有效 (http://3055039.blog.hexun.com/6776722_d.html). So "a late acceptance" can be translated as "逾期承诺". If we continue to read the article on the web page, we can get much more information on offer and thus greatly expand our knowledge.

The sentence may be translated as the following:

如果载有逾期承诺的信件或其它书面文件表明，它是在传递正常、能及时送达要约人的情况下寄发的，则该项逾期承诺具有承诺的效力，除非要约人及时用口头或书面通知受要约人该要约已经失效。(Chen, 2007)

4.7 Pedagogical Guidelines

In this chapter we examine the integration of the minor electronic tools for translators into translation teaching, including machine translation systems, electronic dictionaries, electronic encyclopedias, corpora, and search engines. And we can see that these tools are

relatively easy to use, so in teaching these tools the orientation should be put on the use of these tools to teach translation skills, although the usage of these tools is also our teaching objective. And it is recommended to use a PC lab in which computers can connect to the Internet so that students can have opportunities to participate in hands-on activities.

And we may combine the teaching of these various electronic tools with the teaching of the various translation skills or the translation of various text types. For example, we may choose to use the following combinations: machine translation systems – technical texts, that is, teaching machine translation systems and the skills of translating technical texts at the same time, electronic dictionaries – financial texts, electronic encyclopedias – political texts, corpora – literary texts, and search engines – legal texts.

And from the demonstrations in this chapter we can also see that these electronic tools are useful in any translation scenario and the benefits of using the tools are obvious, so the translation tasks do not need special design. And the teaching implementation may follow the pattern of demonstration plus hands-on activities.

Chapter 5.Conclusion

This chapter first summarizes the major points of the thesis, and then discusses the limitations of the study, and proposes the suggestions for future studies.

5.1 Summary of the Study

The thesis proposes the topic of integrating translation technology into translation teaching and discusses the various aspects of the new translation teaching content (translation technology) and method (task-based learning). But all these efforts are tentative, and the proposed teaching content and method are open to evaluation and criticism so that they can be improved.

At present many translation companies complain that they cannot find eligible translators on the human resources market. And many senior translators and famous translation scholars complain that the translation quality is declining. So most people in translation circle agree to the point of view that the current translation teaching needs reform, and some translation researchers have already put forward specific and systemic plans for translation teaching reform. But it is a pity that few of these suggestions have been put into practice, and the translation course has few changes compared to the past. Perhaps translation teaching reform will also be a long and gradual process just like all the other reforms in China.

And perhaps most people agree that one important aspect or component of translation teaching reform is the introduction of translation technology into translation teaching because of the simple fact that most professional translators translate electronic texts on computer now. And the introduction of translation technology into translation teaching can take several different forms like establishing independent courses on translation technology, adding translation technology as a patch into the existing translation courses; the thesis approaches the problem from the perspective of integrating translation technology into translation teaching systematically in consideration of the current typical situation of translation teaching in China. Most colleges are probably not able to find eligible teachers to teach independent courses on translation technology, and maybe they cannot increase the total teaching time of translation courses, so establishing independent courses on translation technology may not be practical in these colleges. And if we add translation technology as a patch into the existing translation courses, students may not be able to obtain enough knowledge on translation technology to meet the challenges in the translation jobs they will do. And integrating translation technology into translation teaching systematically may be a good compromise

which only requires the teachers to have some knowledge on translation technology and which does not require the school to increase the total time of the translation courses because the teaching content and method of translation technology can be integrated into those of the existing translation courses seamlessly as described above.

And while we focus on the benefits translation technology brings us, we also need to be well aware of the disadvantages of using translation technology so that we can have a comprehensive understanding. Some types of texts like literary texts do not have a high percentage of repetition, so using translation memory systems to translate literary texts may turn out to be disappointing. In translation memory systems the source text is segmented into sentences and phrases, so it may be harder for translators to consider their translation from the perspective of linguistic units larger than sentences and produce coherent versions. And when we use search engines to look for the translation of a particular term, it may also be difficult to judge whether the translation found is credible. But luckily in these aspects the use translation technology is mutually complementary to the exercise of translation skills.

5.2 Limitations of the Study

As far as the author can see, the study has the following deficiencies.

First, many important topics on translation technology, such as various aspects of localization and the use of general software, are omitted because of the limitation of the length of the thesis. So only the basics of translation technology are covered in the thesis.

Second, the thesis does not focus on the creation of offline multimedia courseware or online courses for a variety of reasons. Since translation technology is closely related to computer science and technology, the teaching of translation technology may make full use of the various courseware authoring programs such as Authorware and Moodle to develop media courses, and screen recording software to create animation demonstration of the various operations discussed in the thesis. But the creation of good offline multimedia courseware and online courses is a large project, so it is usually done by a team consisting of experts from different domains, rather than by an individual.

Third, although the typical situation of translation teaching in most Chinese colleges has been taken into consideration, there may still be a number of difficulties in implementing the design of the thesis – integrating translation technology into the existing translation teaching systematically. The first difficulty is the inter-disciplinary nature of translation technology, which requires that teachers and students of English major have a good command of related computer knowledge which proves to be extremely extensive. The second is that not every school is able to provide multimedia classroom for translation courses. The third is that some schools may not be able to provide the relevant software. The fourth is the availability and

training of competent teachers who can teach translation technology systematically. And the fifth is whether the head of the English department supports the attempt.

5.3 Suggestions for Further Studies

Since there are deficiencies in this study the following suggestions for further studies are proposed.

First, many important topics that are omitted in the thesis, such as translating files of more complicated formats, should also be studied in detail.

Second, it may be necessary to expand the thesis to a book so that more topics can be covered and more translation tasks can be demonstrated.

Third, if the thesis is expanded to a book, the offline multimedia courseware and online courses accompanying the book need to be created.

Fourth, the teaching contents of translation technology need to be constantly updated in consideration of the rapid development of translation technology.

Fifth, the influences of integrating translation technology on translation teaching, translation courses, translation teacher training and translation market are also worth studying. For example, we may compare translation teaching after integration to translation teaching before integration to find out their respective features, advantages and disadvantages.

References

Austermühl, F. (2006). *Electronic tools for translators.* Beijing: Foreign Language Teaching and Research Press.

Cleese J. (2005). To the citizens of the United States of America. Retrieved Aug. 25, 2008, from http://www.rense.com/general66/unit.htm

eCoLoRe Project. (2005). Econtent localization resources for translator training. Retrieved Aug. 22, 2008, from http://ecolore.leeds.ac.uk/

Dictionary. (2008). In *2008 Encyclopedia Britannica Ultimate DVD-ROM.* Chicago: Encyclopedia Britannica, Inc.

Ellis, R. (2000). Task-based research and language pedagogy. *Language Teaching Research, 4*(3), 193-220.

Encyclopedia. (2008). In *2008 Encyclopedia Britannica Ultimate DVD-ROM.* Chicago: Encyclopedia Britannica, Inc.

Esselink, B. (2000). *A practical guide to localization.* Amsterdam/Philadelphia: John Benjamins Publishing Company.

Estaire, S., & Zanon, J. (1994). *Planning classwork: A task-base approach.* Oxford: Macmillan Heinemann.

Glasersfeld, E. von. (1995) *Radical constructivism: A way of knowing and learning.* London: Falmer Press.

Guo Yijun. (2006). *Implementing a task-based approach with senior high school students: Characteristics of interactions and students' perceptions.* Unpublished master's thesis, National Tsing Hua University, Taiwan.

Hatim, B. (2005). *Researching and teaching: Translation.* Beijing: Foreign Language Teaching and Research Press.

Hoey, M. (2004). The textual priming of lexis. In G. Aston, S. Bernardini and D. Stewart (eds). *Corpora and Language Learners.* Amsterdam/Philadelphia: John Benjamins Publishing Company.

Hutchins, J. (2007). *Compendium of translation software.* Geneva: EAMT.

Hutchins, J., & Somers, H. (1992). *An introduction to machine translation.* London: Academic Press.

LingoSystems. (2006). *The guide to translation and localization.* Portland: Lingo Systems.

Melby, A. K. (1998). Eight types of translation technology. Retrieved March 22, 2008, from http://www.ttt.org/technology/8types.pdf

MELLANGE. (2007). Reference curriculum for the study program for the "European Master in Translation Technologies (EM-TT)" Retrieved April 6, 2008, from http://mellange.upf.es/wp6/public-documents/EM-TT%20Reference%20Curriculum%20final%20version/view

Meyer, C. F. (2002). *English corpus linguistics: An introduction.* Cambridge: Cambridge University Press.

Nord, C. (2001). *Translation as a purposeful activity - Functional approaches explained.* Shanghai: Shanghai Foreign Language Education Press.

Nunan, D. (1989). *Designing tasks for the communicative classroom.* Cambridge: Cambridge University Press.

Nunan, D. (1991). Communicative tasks and the language curriculum. *TESOL Quarterly, 25*(2), 279-295.

Osborne, R. J., & Wittrock, M. C. (1983). Learning science: A generative process. *Science Education, 67*(4), 489-508.

Piaget, J. (1955). *The child's construction of reality.* London: Routledge and Kegan Paul.

Pym, A. (2006). Asymmetries in the teaching of translation technology. Retrieved Aug. 23, 2008, from http://www.tinet.org/~apym/on-line/training/Pym_TeachingAsymmetries.pdf

Sánchez, P. M. (2006). Electronic tools for translators in the 21st century. *Translation Journal, 10*(4). Retrieved March 23, 2008, from http://accurapid.com/journal/38tools.htm

SDL International (Producer). (2006). SDL Multiterm 7 [Computer software and training documentation].

SDL International (Producer). (2006). SDL Trados 2006 [Computer software and training documentation].

Search Engine. (2008). In *2008 Encyclopedia Britannica Ultimate DVD-ROM.* Chicago: Encyclopedia Britannica, Inc.

Skehan, P. (1998). *A cognitive approach to language learning.* Oxford: Oxford University Press.

Somers, H. (2003). The translator's workstation. In H. Somers (Ed.), *Computers and translation: A translator's guide.* Amsterdam/Philadelphia: John Benjamins Publishing Company.

The Editors of Consumer Guide. (2006). Everglades national park. Retrieved Sep. 12, 2008, from http://adventure.howstuffworks.com/everglades-national-park-ga2.htm

Translation. (2007). Retrieved Feb. 25, 2007, from Wikipedia: http://en.wikipedia.org/wiki/Translation

Ubuntu. (2008). The Ubuntu promise. Retrieved Aug. 23, 2008, from http://www.ubuntu.com/

Vygotsky, L. S. (1986). *Thought and language*. Cambridge, MA: MIT Press.

Wallis, J. (2006). *Interactive translation vs. pre-translation in the context of translation memory systems: Investigating the effects of translation method on productivity, quality and translator satisfaction.* Unpublished master's thesis, University of Ottawa, Ontario, Canada.

Wassmer, T. (2008). Dr. Tom's independent software reviews: Trados. Retrieved Aug. 23, 2008, from http://www.localizationworks.com/DRTOM/Trados/TRADOS.html

Widdowson, H. G. (1998). Context, community, and authentic language. *TESOL Quarterly, 32*(4), 705-716.

Willis, J. (1996). *A framework for task-based learning*. Harlow: Longman

北京大学软件与微电子学院[School of Software and Microelectronics Beijing University] 北京大学计算机辅助翻译高级研修班课程[OL]. 北京: 北京大学, 2008[2008-2-28]. http://www.ss.pku.edu.cn/index.php?option=com_content&task=view&id=950&Itemid=464

陈宏薇等[Chen Hongwei, et al.]. 新编汉英翻译教程[M]. 上海: 上海外语教育出版社, 2004.

陈建平[Chen Jianping]. 法律文体翻译探索[M]. 杭州: 浙江大学出版社, 2007.

传神联合信息技术有限公司[Transn Information Technology Co.]. 传神翻译平台[OL]. 北京: 传神联合信息技术有限公司, 2008[2008-2-25]. http://www.transn.com/info/c3-platform.html

方梦之[Fang Mengzhi]. 英汉翻译基础教程[M]. 北京: 中国对外翻译出版公司, 2005.

冯庆华[Feng Qinghua]. 实用翻译教程[M]. 上海: 上海外语教育出版社, 2002.

冯志伟[Feng Zhiwei]. 机器翻译研究[M]. 北京: 中国对外翻译出版公司, 2004.

冯志伟[Feng Zhiwei]. 译者的电子工具导读[M]// Austermühl, F. 译者的电子工具. 北京: 外语教学与研究出版社, 2006: ix.

胡壮麟[Hu Zhuanglin]. 语言学教程（修订版）[M]. 北京: 北京大学出版社, 2001.

金山软件公司[Kingsoft]. 谷歌金山词霸合作版[CP]. 北京: 金山软件公司, 2008.

柯平[Ke Ping]. 英汉与汉英翻译教程[M]. 北京: 北京大学出版社, 1991.

黎土旺[Li Shiwang]. 语料库与翻译教学[J]. 中国科技翻译, 2007, 20(3): 46-49.

李德凤，胡牧[Li Defeng & Hu Mu]. 学习者为中心的翻译课程设计[J]. 外国语, 2006, 162(2): 59-65.

刘宓庆[Liu Miqing]. 翻译教学：理论与实务[M]. 北京: 中国对外翻译出版公司, 2003

刘宓庆[Liu Miqing]. 文体与翻译[M]. 北京: 中国对外翻译出版公司, 1998.

刘宓庆[Liu Miqing]. 英汉翻译技能训练手册[M]. 上海: 上海外语教育出版社, 1987.

罗选民[Luo Xuanming]. 中国的翻译教学：问题与前景[J]. 中国翻译, 2002, 23(4): 58-59.

鹿鹏[Lu Peng]. 翻译技术课程设计[J]. 考试周刊, 2008(13): 119-120.

吕瑞昌等[Lv Ruichang, et al.]. 汉英翻译教程[M]. 西安: 陕西人民出版社, 1983.

穆雷[Mu Lei]. 中国翻译教学研究[M]. 上海: 上海外语教育出版社, 1999.

乔萍等[Qiao Ping, et al.]. 散文佳作108篇（汉英·英汉对照）[M]. 南京: 译林出版社, 2002.

史宗玲[Shih Chung-ling]. 翻译记忆教学：个案研究[J]. 英语教学期刊, 2006, 30(4): 47-68.

王华伟，崔启亮[Wang Huawei & Cui Qiliang]. 软件本地化：行业透视与实务指南[M]. 北京: 电子工业出版社, 2005.

王克非等[Wang Kefei, et al.]. 双语对应语料库研制与应用[M]. 北京: 外语教学与研究出版社, 2004.

王涛，鹿鹏[Wang Tao & Lu Peng]. 翻译技术的理念与分类[J]. 中国科技翻译, 2008, 21(1): 20-23

王治奎等[Wang Zhikui, et al.]. 大学汉英翻译教程[M]. 济南: 山东大学出版社, 2005.

王治奎等[Wang Zhikui, et al.]. 大学英汉翻译教程[M]. 济南: 山东大学出版社, 2004.

肖红[Xiao Hong]. "翻译作坊"在翻译教学中的应用[J]. 四川外语学院学报, 2005, 21(1): 139-142.

新华网[Xinhuanet]. 行业渐兴 外资觊觎 200亿元翻译市场成诱惑[OL]. 北京: 新华网, 2005[2008-2-25].
http://news.xinhuanet.com/newmedia/2005-05/13/content_2953226.htm

杨莉黎[Yang Lili]. 英汉互译教程[M]. 开封: 河南大学出版社, 1993.

袁亦宁[Yuan Yining]. 翻译技术与我国技术翻译人才的培养[J]. 中国科技翻译, 2005, 18(1): 51-54

张美芳[Zhang Meifang]. 中国英汉翻译教材研究（1949-1998）[M]. 上海: 上海外语教育出版社, 2001.

张培基等[Zhang Peiji, et al.]. 英汉翻译教程[M]. 上海: 上海外语教育出版社, 1980.

张秀平，王晓明[Zhang Xiuping & Wang Xiaoming]. 影响中国的一百本书[OL]. Retrieved Aug. 23, 2008, from http://www.bioon.com/book/zhonghe/china100book/13.htm

中科院科技翻译协会，传神联合信息技术有限公司[Science and Technology Translators Association of the Chinese Academy of Sciences & Transn Information Technology Co.] 中国地区翻译企业发展状况调查报告[OL]. 北京: 中科院科技翻译协会，传神联合信息技术有限公司, 2007[2008-2-27]
http://www.sttacas.org/download/fanyiqiye-20070410.doc

Acknowledgements

No thesis is the work of one writer; such is the case with Translation Teaching – Integrating Translation Technology. Behind the pages are many people who have given me guidance, encouragement, support, and inspiration. So here I would like to take this opportunity to express my heartfelt thanks to all these people.

First of all, I must acknowledge the invaluable guidance and generous help of my supervisor, Associate Prof. Wang Tao, whose illuminating instruction and advice have guided me through all the phases of developing and revising the thesis. In the process of conceiving and writing the thesis he has asked me to reconsider the fundamental issues like the title, the structure, and the selection and presentation of the thesis contents so that I could develop the thesis from a mess to what it looks like now, and at the stage of revision, he has read the draft word by word, pointing out the mistakes and helping remedy them. It is no exaggeration to say that without his supervision and support the completion of the thesis would have been impossible.

I am also grateful to all my teachers in the School of Foreign Languages, Southeast University, whose lectures have benefited me a lot and proved to be significant to my thesis writing, and to all my classmates who have given me help on various occasions and discussed the academic questions related to the thesis. The unforgettable days with my teachers and classmates in the last two and half years have witnessed the beginning of my academic career and my academic growth.

Finally I am indebted to my family for all their concerns for me, all their support for me, and all that they have done for me all the years. Words always seem insufficient to express my indebtedness to my family.

Author Introduction

Lu Peng, whose academic interest is translation theory and practice, is now studying at School of Foreign Languages, Southeast University for the degree of Master of Arts. His published papers are as follows:

王涛, 鹿鹏. 翻译技术的理念与分类[J]. 中国科技翻译, 2008, 21(1): 20-23.

鹿鹏. 翻译技术课程设计[J]. 考试周刊, 2008(13): 119-120.