Technical Translation in a Commercial Context: A Focus on Festo Didactic

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Abstract

Technical Translation in a Commercial Context: A Focus on Festo Didactic

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This thesis reports the results of an empirical case study exploring two technical translation processes of Festo Didactic, a multinational producer of digital and non-digital technical and technological learning material. Data was collected through surveys, interviews, observation, and documents. Skopos theory and business and project management principles were used to bring into special focus the constraining conditions in which technical translations are produced in a commercial context, which help determine translation quality. Because technical translation deals with the application by some user of a technology or scientific theory, the importance of users and related questions of usability, terminology and safety were emphasized.

Ce mémoire de thèse rapporte les résultats d'une étude de cas empirique explorant deux processus de traduction technique de Festo Didactic, un producteur multinational de matériel d'apprentissage technique et technologique numérique et non-numérique. Les données ont été recueillies par le biais de questionnaires, d'entretiens, d'observations et de documents. La théorie du skopos et les principes de gestion des affaires et des projets ont servi à mettre en évidence les conditions contraignantes dans lesquelles les traductions techniques sont produites dans un contexte commercial et qui contribuent à déterminer la qualité des traductions. Vu que la traduction technique porte sur l'application par un utilisateur d'une technologie ou d'une théorie scientifique, l'accent a été mis sur l'importance des utilisateurs et sur les questions connexes de convivialité, de terminologie et de sécurité.

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1 Introduction

Following an impasse with my new Hurom juicer, I knew that the topic of technical translation and its impacts deserved investigation. Ready to call Customer Service, armed with evidence that the juicer was inoperable, I deemed it best to first compare my French instruction guide with the English one. As a result, I never had to make the call, and my family was drinking fresh apple juice a few moments later. I had been on the receiving end of a mistranslation, which cost me time and could have cost the company money. Yet, in my career as a technical translator, I had more significant worries: What happened when people used the texts I produced? Technical texts, which we define as those relating to using one or more technologies or applying one or more scientific theories (Olohan 2016, 6; Byrne 2007, 8), entail *utility* (Folaron 2020, 207, Olohan 2016), as they are linked to some machine, technology, or scientific application. The stakes are arguably higher than with other texts. They often involve safety risks to humans, making the accuracy and clarity of communications paramount. Alas, translation adds another layer of possible miscommunication and, thus, risk (Canfora and Ottmann 2018; Drugan 2013, 44). Therefore, layers of steps, methods, and checks are tacked on to the activity of translation proper to surmount this vulnerability: controlled authoring, guidelines, quality control, evaluations, terminology banks, etc. (Folaron 2020, 207). Quality is thus thrust to the centre of any technical translation effort. What is quality? This old question deserves new answers. While Translation Studies (TS) scholars may not have agreed upon a definition of quality, industry seems to have gotten closer. Near to this central preoccupation, we find additional considerations that stem from the intimate tie between technical translation and commercial viability, notably time and cost. They regulate the performance of technical translation, for without managing them, the pursuit of quality becomes impossible.

These constraints may also explain why translation treatment in academia and industry can be vastly different. While translation theory often aims at establishing high ideals for interlingual production, assessment, and quality assurance, translation in practice can be significantly inhibited by the scarcity of resources and time. High volume needs, highly specialized content and a limited number of translators conversant with the subject matter (Drugan 2013) further stress technical translation. A theorist might be surprised to discover that any translation can occur at all! Nonetheless, the corporate world does indeed manage to perform technical translations on budget and on time. Apparently, the translations do the job intended since companies do enter new linguistic markets and grow their revenues.

Festo Didactic, for example, is an 800-employee producer of digital and non-digital educational materials for the technical and technological sectors (see https://www.festo-didactic.com/ca-en/), which it translates and sells to over 30 countries. A snapshot of such a company's translation processes is well apt to inform the discussion on the business practice of technical translation. Therefore, the main goal of my thesis was to describe Festo Didactic's translation processes at their Quebec office. In so doing, and with a wish to inform theory with practice and practice with theory, I hoped to glean insights into the practice of technical translation in a commercial context and into how good translations are achieved. I began my research with several assumptions garnered from my experience as a freelance technical translator and linguistic validation consultant[1]. I believed that the commercial context impacts the production of technical translation: that it constricts and defines it. Given that Festo Didactic works in highly technical fields, I also suspected that its translation processes were well

[1] In my role as linguistic validation consultant I oversaw the translation of quality of life instruments through a complex process of translation, in which I verified the comprehensibility of the finalized translations through structured interviews with potential users, where they were asked to paraphrase the meaning of each sentence.

structured and organized in such a way as to increase translation uniformity and that it had technological tools (such as translation memories [TMs]) to manage its translations and its translation quality assurance process in place. I supposed that there were several different translation processes for different text types. For instance, corporate financial statements might be outsourced, while technical documentation might be performed in-house. I assumed that the current translation processes were adequate (that is, considered good enough by the company for its business purposes: to sell didactic products and services while meeting the educational needs of their clients and end users.) I expected that the translation team would not be well versed in translation studies concepts and theories, but their intuitive translation philosophies influenced their translation decisions. Finally, I believed the company would not necessarily have found ways to ensure that its terminology coincided with the terminology used by readers of their content and that it could perceive translation as a risk for the safety-critical sectors in which it works.

In 2010, Geoffrey Kingscott asserted that 90% of the world's translation was technical translation (Kingscott 2010). Technological development, which has not slowed in the past twelve years, is closely shadowed by technical translation and localization activity (Folaron 2020, 212). While commercial gain drives the performance of most translations, studies of both technical translation and commercial translation have grown at a slow pace, and there is still a lack of systematic research carried out in practical settings (Drugan 2013). Although this is currently changing, there is a comparatively small number of studies dealing with technical translation and localization (Folaron 2020, 212). Some researchers lament theories are too often uninformed by the realities of commercial translation practice and by solid data garnered from "real-world" environments. For instance, empirical studies are too often performed in controlled

settings, such as universities (Ehrensberger-Dow and Massey 2019; Drugan 2013, 12, 29, 30), and there are too few descriptions of how translation works in the reality of a corporate setting (Huertas-Barros, Vandepitte, and Iglesias-Fernández 2019). Fortunately, researchers have shown greater interest in situated translation practice in recent years: where and how translation happens in professional practice, manifested especially towards both *micro* (also called *cognitive* [Halverson 2020, 65]) and *macro* (workflow) processes (Angelone et al. 2020, 355; Ehrensberger-Dow and Massey 2019). Other researchers state that empirical studies without the theoretical framework to make sense of the results are ineffectual. While recent books on TS research (Zanettin and Rundle 2022; Williams and Chesterman 2014; Saldanha and O'Brien 2013) continue to foster more systematic progress in both empirical and theoretical studies, the bridging of the two must continue.

Apart from several researchers (Olohan 2016; Drugan 2013), there is limited academic focus on considering users as essential elements in the pursuit of translation quality. Yet, users shape global communication channels that depend on localization and translation (Folaron 2020, 214), and we can expect that "the experiences and expectations of users" will be in greater focus in localization (Folaron 2020, 214). For one, the exponential increase in the use of machine translation (MT) has led users to contribute to crowdsourced translation projects and unofficial translations of games or comics (Drugan 2013, 24). This has sparked interest in the study of users, where they also play the role of MT post-editors (Guerberof Arenas 2019, 23-24). The study of users forms a large part of marketing studies. Why not incorporate some of their insights into TS (Folaron 2020)? Little has been done regarding terminology adequacy: What do users really understand? To find out, one way would be to get their feedback. Some research undertaken regarding user feedback is only relevant in certain locales (Van der Meer 2020). Still,

industry has been more rapid in making use of this feedback. Language service providers have begun seeking to understand customer experience through research (Van der Meer 2020). Microsoft and Meta (previously Facebook) have equipped their localized website or social platform pages with tools allowing users to provide limited feedback. Some researchers have begun looking at translation quality assessments on social platforms (Desjardins 2019, 389). Much more work can be carried out in this regard. Because usability is a "key criterion for designers of any technical documentation" (Olohan 2016, 51), I consider users to be a vital concern for technical translation practice. Therefore, the thesis approaches this subject and related topics that take into account safety risks and the need for clear terminology.

This thesis can benefit the TS community in understanding how one company performs its technical translations, how translation quality is perceived and achieved, and how users are considered. While a broader gamut of private and public organizations needs to be surveyed to garner robust benchmarking data to validate (or invalidate) beliefs and theories in technical translation processes, the proposed study will support and may further spur broader inquiries into commercial technical translation practices.

One weakness of this study is apparent: it garners data from a single company, thus limiting any generalization of the research results. Nevertheless, the particular company under study affords many research benefits. As one of the business units of Festo, a leading global manufacturer of cutting-edge process control and intelligent factory automation, Festo Didactic offers advanced technological learning solutions and products to universities and businesses through its 64 offices worldwide. Their offerings include training packages, learning factories, scaled-down simulators, software, process automation, and turnkey learning centres. Because Festo Didactic's business aim is educational, texts describe an extraordinary variety of

innovative and basic scientific and technological information in detail. The richness and precision of the subject matter, coupled with a prolific production of content, cannot but afford pertinent data for this study. Moreover, the advantage of conducting a more in-depth analysis of this type in such a multifaceted, multinational company context potentially allows for a rigorous point of departure for other studies to be carried out later in similar contexts.

In the following chapter, I will discuss my research methodology, followed by the results of the research in chapter 3 and a discussion in chapter 4.

2 Methodology

2.1 Methodology Overview

In this chapter, I describe my research (2.2) and my data collection methods (2.3). I then explain the process I used to find the company that became the subject of my research. I also describe the data collection methods and the study population. I then explain the process of developing the various tools necessary to collect and analyze the data (2.4). I end with my data analysis methods (2.5).

2.2 Type of Research

The aim of this research was to describe translation processes at Festo Didactic's Quebec office and obtain insights into the practice and context of commercial and technical translation. Festo Didactic was selected after I had carried out an active search for companies that perform or mandate technical translations but which are not language service providers (LSPs). I sought a company with a business purpose other than translation. The study centred on business translation macro-processes. In other words, it focused on the steps that make up the company's translation production cycle or workflow. The investigation was meant to contribute to solving

the problem of an insufficient number of applied translation studies (Dunne and Dunne 2011, 2; Drugan 2013) and an inadequate number of technical translation studies (Födisch 2017, 13; Byrne 2006, 1). Because most of the company's texts for translation are pedagogical in nature, this study gave attention to pedagogical aims in its discussion on usability.

The methodology used to achieve the aim of this research was exploratory and qualitative. A qualitative collection of primary data was well suited for this exploratory research (although I explain later how my initial intention was to take a mixed-method approach, a choice that was impeded by the low study population numbers), and a case study best captured the holistic nature of the business environment. Moreover, limited time and money, as well as limitations imposed by the scope of a master's thesis, are also better served by one case study. In case studies, it is recognized that the greater the variety of sources of information, the greater the quality of the research (Gagnon 2012, 60). The richness of data obtained by using an array of data collection methods ensures that the results are well substantiated (Gagnon 2012, 59-60). Company and media documents, surveys, interviews, and participant observation afforded information on commercial translation processes not often accounted for in academic literature (Kelly and Cordeiro 2020, 5; Stake 2013).

I explored a few themes emerging from the broad array of findings with the help of academic theory and concepts. Skopos theory (Reiss and Vermeer 2013), which is used extensively in TS to describe translation in the real world or in business (Martínez 2014, 73), served as the backdrop, while technical translation and localization (Olohan 2016; Byrne 2006; Folaron 2020; Desjardins 2019), business principles and project management theory (Heizer and Render 2014; Project Management Institute 2021; Dunne and Dunne 2011), and users of translations (Desjardins 2019; Suojanen, Koskinen, and Tuominen 2014) were additional areas

that provided insight. Truly, in the world of business, technical translation is intertwined with commercial aims (Byrne 2006, 1), the scarcity of resources, and the use of products and services (Olohan 2016; Byrne 2006).

As will be discussed later, using the skopos theory from translation studies to discuss possible patterns in the data proved to be sensible. The world of business is a pragmatic one, and so is this theory's conceptual framework. Furthermore, the application of project management concepts to the study of commercial translation appears to be a natural fit. Elena and Keiran Dunne, in their book *Translation and Localization Project Management: The art of the possible* (2011, 4), state that "professional translation is a project-driven undertaking *par excellence*." It can serve as a link between what Holmes defines as pure and applied translation studies and between academia and practice (2011, 6). Moreover, translation project management is an ideal object "of study for process-oriented descriptive translation studies" (2011, 6).

In this thesis, I refer to translation in the sense of both technical translation and localization unless I specify otherwise. It would be impractical to divide the discussion (within the constraints of this thesis) as many of Festo Didactic's texts (for instance, software, help files, online courses, and digital textbooks) span both concepts. Although localization can be imprecisely defined in TS, and localization and technical translation have overlapping applications (Folaron 2020), the term is generally used to refer to the specific linguistic, cultural and technical-technological adaptation of content for different locales. Here, if I use the word "localization," it is either because I am referencing scholarly work that deals with it specifically or because I wish to underline its particularities.

2.2.1 Epistemology

My epistemological position is pragmatism, in which methods are chosen not based on an ontological stance but instead on their capacity to give the best practical understanding of real-world issues (Kelemen and Rumens 2012, 1, quoted in Kelly and Cordeiro 2020, 2), and complex organizational processes (2020, 1, 2). Pragmatic research is driven by a desire to produce valuable knowledge, is well suited to applied inquiries and allows for the triangulation of results of different types of questions more freely without an undue separation of theory and practice (2020, 3, 4). This assertion aligns with my exploratory aims, holistic outlook, and desire to create research that can serve researchers and business leaders alike.

2.3 Data Collection

In this section, I will first explain the process I used to find a willing corporate subject for this inquiry, followed by a detailed explanation of my data collection methods.

2.3.1 Company Recruitment

I initiated my search by launching a recruitment campaign in May 2018. It was a challenging part of the research and lasted almost two years, including periods of recruitment inactivity and discouragement. To start, I called every company that works in a technical field and operates within a 50 km radius from my home in Hammonds Plains, Nova Scotia, and that is listed in the Halifax Regional Municipality Yellow Pages and the Atlantic Business Directory. Administrative assistants answered most of my cold calls and were more helpful than senior executives in establishing further contact when I made my request concisely and confidently. Once the assistants confirmed that their company produced documents in more than one language, they asked for, or I offered to send, a follow-up email (Appendix A). None of these follow-up emails led to any further communication. This lack of success may have been caused

by the sensitive nature of my request. Investigating malfunctions may have legal and public relations repercussions.

I used many other recruitment methods, but the winning connection was cleverly established by my thesis supervisor, Professor Deborah Folaron. She attended an event organized by the Innovation 4.0 Network (a consortium of eight Quebec universities, including Concordia University) called the *First International Innovation 4.0 Forum.* Concordia's representative, Professor Rolf Wuthritch, was in attendance. He is Associate Professor in the Mechanical, Industrial, and Aerospace Engineering Department and holds the Concordia Research Chair in Industry 4.0. Prof. Folaron spoke with Prof. Wuthritch about my research project. He introduced her to a senior executive at Festo Didactic who expressed interest in the project. After an online meeting between the company executive and my thesis supervisor, the executive organized an online appointment with me to discuss a potential collaboration. This first interview was invaluable in subsequently designing the research, as much information about the company and its processes was shared. I then sent a formal research proposal to Festo Didactic that later served as the basis for the academic version of the thesis proposal submitted to the translation studies program for approval.

After Festo Didactic accepted my proposal, but before submitting my academic proposal to the University, I began the process of making an application to Concordia's Research Ethics Unit to be granted the right to perform research with human subjects. It was a lengthy process, the most difficult part of which was designing the research and all the data collection instruments at a very preliminary stage of the research (see section 2.3.2) when I knew very little about the company and its processes. (I later found out that I could have designed only representative samples of my data collection tools and not the finished versions.) Once I received my

Certificate of acceptability for research involving human subjects, I began the process of submitting my academic proposal to the university, which was subsequently approved. With the Certificate of acceptability, I was able to proceed with my data collection. I have summarized my company recruitment methods below in chronological order of their first use.

Method	Via	Results
Cold calling companies	Yellow Pages, telephone	**Poor**; most companies stated that they did not produce translations; no recruit
Cold calling company leaders	Atlantic Business Directory, telephone, admin. assistants, email	**Fair**; several companies confirmed that they performed or mandated translations and asked for an email detailing our request; no recruit
Cold calling companies, based on encountering their signage	Street signage/Google Maps, telephone	**Fair**; a good portion of the companies showed an interest when mentioning their location first and asked for an email detailing our request; no recruit
Cold contacting influencers in the aerospace industry	LinkedIn	**Fair**; one in-depth conversation on research needs; a promise to put us in contact with companies that would be willing to work with us; no recruit
Contacting friends and acquaintances	Telephone, LinkedIn, Facebook, email	**Poor**; only a small minority asked follow-up questions, and only one agreed to help; no recruit
A chance encounter with leaders of an umbrella organization of Nova Scotian technology companies	In-person meeting	**Good**; a follow-up in-person meeting was scheduled, and a follow-up email was requested to send to member companies; there was a solid interest garnered with this organization, but not with individual companies; no recruit
Email introduction from thesis supervisor with an executive in the aerospace industry	Telephone conversation, email exchange	**Fair**; a telephone call followed by two emails; the executive adamantly affirmed that there would be no interest from aerospace companies given the many regulations; no recruit
Networking at the Industry 4.0 Conference held in Montreal in Nov 2019	Thesis supervisor, Concordia's Innovation 4.0 Network liaison, 1st International Innovation 4.0 Forum	**Excellent**; Concordia University's liaison introduced my thesis supervisor to the senior executive at Festo Didactic, who was also in attendance; emails and online meetings followed; a **successful outcome**

Table 1: Recruitment Methods

2.3.1.1 Recruitment Evaluation

The recruitment phase served as a learning experience that ultimately led to reflections and suggestions on how to improve the cold-calling technique for better results. They include:

- Studying the recipient and customizing the research proposal to take into consideration the needs of the company (this would need to be carefully thought through, well defined, and cleared with a university's research ethics unit);
- Shortening the follow-up letter from two pages to one and making its layout look more important from the standpoint of the recipient;
- Using more concise and direct language;
- Sending the email from a university email account; and
- Identifying organizational support in the signature and/or header of the letter.

Another approach would be to consult related university departments and professors in person. I say *in person* because, in this experience, the two in-person requests gave superior results. The best outcome ensued at a conference meant to bring academia and industry together for the purpose of research and development. I highly recommend this method, as it logically appears to be the best way of forming collaborations of this kind.

2.3.2 Data Collection Methods

In my original research plan, I had wanted to measure the concrete—and quantifiable—impact of technical translations on users as a means to bypass (or complement) the usual translation quality criteria on which it is difficult to get consensus from academia or industry (Drugan 2013, 28). I had planned to count the number of malfunctions, or the number of customer service calls for some machine or device (such as planes or toasters) that was assembled or operated with the help of original language or translated assembly/operations manuals. My first interview with Festo Didactic revealed that the company does not collect such data, and I had to shift my research focus.

Once my new goal was set to describe Festo Didactic's translation process, I discovered from the literature that the best way to do this was to also learn about its environment. In other words, the data collected should not be aimed solely at obtaining a list of business tasks performed in a specific order. People are not machines. Hence, an apparently simple and well-ordered process may contain many variants, variables, inconsistencies, and unwritten rules and procedures. It is also couched in other business realities, such as the need to make a profit, the employees' resistance to change, etc.

It seemed natural to choose a case study methodology as the umbrella method to apprehend the process in its complexity. Document analyses, surveys, semi-structured interviews, and in-person observations were selected among other collection methods for their individual and aggregate effectiveness (Gagnon 2012, 59-60).

Analyzing documents is an excellent method to corroborate data gathered from different sources (Gagnon 2012, 62). Surveys are excellent tools for quickly gathering a large quantity of varied information (such as facts, opinions, and behaviours) in a structured fashion. They are also valuable for confining and comparing responses (Saldanha and O'Brien 2013, 152). But they are challenging to design, are not well suited to obtaining explanatory data, and encourage embellished answers (Saldanha and O'Brien 2013, 152-153). Interviews are touted as one of the most important sources of information for a case study (Gagnon 2012, 61). The semi-structured interview type is useful for guiding the conversation on chosen themes to achieve the research objectives while still giving much liberty to the participants to answer as they choose (Gagnon 2012, 61). It is the method of choice to discover new information and someone's thoughts and opinions about a topic, but its weakness is that they are time-consuming (Saldanha and O'Brien 2013, 169). It is also hard to compare answers from one interviewee to the next. Moreover, the

greater the liberty in responding, the greater the risk of bias, which can be minimized by corroborating the data (Gagnon 2012, 61-62). In-person observation is best to gather data on the environment (Gagnon 2012, 61) to see what appears on the participant's screen, for example. It is also key for ascertaining certain behaviours (Gagnon 2012, 61), for example, to see whether procedures are, in reality, what they appear on paper. In the following section, I summarize the methods used, categorized as "documents" (section 2.3.2) and "participant data" (section 2.3.3).

2.3.3 Collection of Documents

The documents I gathered to learn more about Festo Didactic's translation processes were articles and internal documents. These texts helped me to better understand the company's history, profile, culture, products and services, markets, regulatory constraints, and guidelines and procedures. Table 2 below details the documents collected, how I obtained them and the purpose of each.

Type of document	Source	To better understand Festo Didactic's…
Articles	Online trade magazines, newspapers	history, profile, and markets
Company brochures	Company website	products, services, and markets
Code of ethics	Company supervisor	ethical constraints and culture
Company website	Internet	products, services, and markets
Procedures	Company supervisor	operations and methods designed to produce translations
Regulations	Internet	regulatory constraints
Style guide	Company supervisor	guidelines designed to produce good translations

Translation memory working guide	Company supervisor	translation memory software procedures
Translations with their source texts	Company supervisor	source texts and the general quality of their translations

Table 2: Collection of Documents

2.3.4 Collection of Participant Data

The participant data that I collected was aimed at answering questions on the phases and steps of the translation process, including who was responsible for each stage and what tools they used, on procedures, such as terminology management, on training, and on beliefs about work. I present the elements of the participant research component in the table below. I state what tools were needed for each data collection method, what information was sought and who were the targeted participants.

Method	Tools	Information sought	Translators (pop. of 3)	Supervisors (pop. of 2)	Writers (pop. of 6)
Surveys (job specific)	Job-specific questionnaires, personal website, and upload widget	Beliefs about translation, and information on training, managing documents, TMs, terminology, reference documents, etc.	3	2	6
Semi-structured interviews	MS Teams, process worksheet, interview questions, MS audio recorder	Steps of the translation process: who, what, how		2	
Observation	iPhone camera, laptop	Physical and on-screen steps taken by the translator to translate	1		

Table 3: Collection of Participant Data

2.3.4.1 Study Population

Festo Didactic's Quebec office employs three translators, six writers, and two supervisors. As I later learned, because of the company's generalized use of machine translation (MT) in its translation processes, the translators mainly work as MT post-editors[2]. One supervisor supervises the translation team, and the other manages the team of writers. This last supervisor works as a contract translator for Festo Didactic and is counted in both groups throughout this study. Thus, he is one of the three translators. We consider that there were eleven initial participants and eight participants who responded (although only ten individuals were asked to participate, and only seven individuals responded).

As shown in Table 4, the size of the samples for the survey and the semi-structured interviews is equal to the size of the populations studied. In other words, everyone working in translation was involved. I surveyed technical writers to give depth to the information gathered and to provide a means to compare and contrast translators' responses. Gathering opinions from the perspective of three different job functions enriched the quality of the data. The company official who approved this study sent an email asking everyone to participate.

Surveys

Three job-specific surveys were conducted. Participants filled out a survey sent to them via email by this company official, and they uploaded it through a designated URL between July 15 and August 15, 2021. The supervisor, who also works as a translator, answered two separate surveys. The survey characteristics are listed below; the surveys can be found in Appendix F.

[2] "Translator" is their official title and thus this is how they are referred to in this study.

Method	Translator	Supervisor	Writer
Question types	Open-ended, closed-ended (nominal, Likert-scales, rating scales, yes-no, matrices)		
Number of questions	31	49	23
Number of items investigated (questions + individual matrix items)	115	149	69
Survey completion	100%	100%	100%
Rate of response	100%	100%	50%

Table 4: Survey Characteristics

The number of questions that each type of respondent was asked is different. Supervisors had questions on management that were not suitable for translators, and I kept the writers' survey as short as possible to respect Festo Didactic's request to minimize their time involved in the study. I retained only questions that I found most useful for the aims of this study.

2.3.4.2 Semi-Structured Interviews

The interviews consisted of a videoconferencing meeting with each of the two supervisors. Each supervisor was asked questions relating to a process worksheet document that I developed (see the description below and the document in Appendix D), a form that also recorded interviewee responses. The interview questions worksheet (see the description below and the document in Appendix E) additionally served as a reminder to ask supplementary questions on topics that may not have been broached when discussing the translation process. For note-taking purposes, the interviews were recorded with Microsoft's standard PC voice recorder software.

2.3.4.3 Observation of a Translator at Work

One translator, selected by Festo Didactic, was video recorded for two hours at his home office in Quebec. Before the COVID lockdown, he worked on-site at Festo Didactic's offices. I forgot to use a stand for my iPhone's video camera, which made the video recording cumbersome. Nonetheless, the session was recorded, and observations were made about formal and informal translation procedures and methods. These simply confirmed parts of the translation procedures directly related to the translator, such as the different software and file formats used, the facility for accessing paper or online reference documents, and the methods used in terminology management.

2.3.4.4 Data Privacy and Security

It is important to note in this section on data collection that procedurally, Festo Didactic Ltd. and individual participants were asked to sign a consent form after being informed of the nature of the study (see samples in Appendix B). Participation in this research study presented no potential risks to participants. No respondent withdrew their participation.

Only the organization was named in the results, while interview and observation participants remained confidential. I intended that questionnaire respondents would benefit from anonymity. Unfortunately, given the small number of survey participants, respondents could be recognized by indirect identifiers (age, native language, etc.) (Seattle University n.d.) and thus lose anonymity and confidentiality. This issue was surmounted by not linking individual responses to those identifiers and by not sharing the raw data with anyone, including the company.

To protect the identity of the survey participants even further, I asked them to upload their questionnaires to our WordPress website anonymously through an add-on called WP Forms instead of sending them to me by email.

To keep company and individual data secure and backed up, all documents and recordings were initially encrypted with an encryption service called Boxcryptor (www.boxcryptor.com) and stored on OneDrive, Microsoft's cloud drive. I later had issues with the decryption of the files, and out of fear of losing the data, I stopped encrypting them. This did not cause ethical concerns, given the fact that OneDrive offers secure cloud storage sufficient for the nature of the data collected. Given the generally non-confidential nature of the data I held, emails used to communicate confidential information were sent from a secure ProtonMail account (www.protonmail.com), which offers zero-access encryption of message archives (Rubenking 2022). All web-based videoconferencing solutions were conducted on Festo Didactic's secure Microsoft Teams account.

2.3.4.5 Special Issues Working With Industry

Working with a commercial entity limits the type of data that can be shared with the academic community. The company under study will be given a copy of my thesis before it is uploaded to the university's thesis repository. It has the final say as to what company information will be included. In other words, the company can request the removal of information it deems proprietary or otherwise confidential. This is akin to allowing study participants to request researchers not to use the information gathered about them. The difference is that for a participant, correct data analysis methodologies would require that all their data be excluded. At the same time, data may be partially excluded in a case study about an organization.

Given the nature of my observations and by taking care of such potential issues when designing the research, I avoided this obstacle. Had I not done so, I would not have been at liberty to share facts indiscriminately. The only way to avoid such an impasse would have been to promise the company anonymity. My research aims made anonymity unnecessary and even undesirable.

2.4 Tools Development

2.4.1 Process Worksheet (Appendix D)

As mentioned earlier, a process worksheet (Appendix E)—was developed to record Festo Didactic's translation process elements. All possible functions (tasks) for the process were listed in expected chronological order, with a space to record answers to each of the following questions: Who is responsible for the task? What software and file formats are used? When is this task performed? How is it performed (if applicable)?

2.4.2 Survey and Interview Questions (Appendices E and F)

Questions for the surveys and supplementary questions for the interviews were developed simultaneously. I had the benefit of the information gleaned from my initial interview with Festo Didactic, Festo Didactic's website, and the company's translation process map, but not much else. I drew from Joanna Drugan's overview of the translation industry (2013), from books on technical translation (Bédard 1986; Olohan 2016), and from my knowledge of the industry gained from ten years of working as a freelance technical translator.

To fulfill the exploratory mandate of this research, I created questions that could cover the broadest array of helpful information about the translation process. Questions were then categorized and assigned to the most suitable collection method and to the respondents who could answer them best. Questions on facts were generally assigned to fewer participants than

questions on opinions and perceptions, except for some important factual questions given to several participants to increase the reliability of their answers.

2.4.2.1 Survey Design

The questions were formulated, and the surveys were structured with the help of Gabriela Saldanha and Sharon O'Brien's explanations of the principles of questionnaire design (2013) and Monkey Survey's online guides "How to Write Good Survey & Poll Questions" (n.d.) and "Survey Questions Examples and Types" (n.d.). The experiential knowledge gained from my work as a linguistic validation consultant was helpful at this point. It entailed the responsibility of overseeing the translation of scientifically designed quality-of-life questionnaires and interviewing participants on the clarity and usability of the questionnaires. Since Festo Didactic employees work in both English and French, I opted to create English surveys to avoid translating the answers and adding a layer of researcher bias (Saldanha and O'Brien 2013, 177). The following guidelines on survey creation were followed:

Formulation of questions

- Use clear and simple language
- Formulate questions positively, that is, in a way that does not encourage negative or disparaging comments (about the company, for instance); this would prevent bias caused by respondents who do not feel comfortable answering honestly
- Make answering questions simple:
    - Choose the best question format for the answer sought (open-ended, nominal, Likert scale, etc.)
    - Give clear and complete instructions on how to answer a question
    - Provide complete and relevant response choices
- Verify that final questions aligned with research objectives

Survey structure

- Minimize the length of the survey
- Organize the questions in a thematic progression
- Place easy-to-answer questions first, generally
- Intersperse open-ended questions in the instrument (to respect its thematic progression and to avoid overloading the respondent with too many long questions toward the end)
- Place personal questions at the end (best answered when trust has been built)

Each survey had a balanced mix of question types chosen for the following reasons:

<table>
<tr><th rowspan="2">Open-ended questions</th><th colspan="5">Closed-ended questions</th></tr>
<tr><th>Nominal</th><th>Yes/No</th><th>Likert-scale</th><th>Rating scale</th><th>Matrix</th></tr>
<tr><td>Allow for more accurate answers
Allow for spontaneous and unbiased answers
Allow for complete and detailed answers
Useful for complicated answers
Useful when there are too many or unknown response possibilities</td><td colspan="5">Constrain more precise answers
Are easier to answer
Speed up the survey process
Answers are easier to compare
Scale evaluations are useful to obtain accurate comparative data
Matrices allow many items to be covered in little time and space</td></tr>
</table>

Table 5: Question Types

One open-ended question that I judged important for my study dealt with defining translation quality, and it was placed early in the three questionnaires to obtain the respondents' spontaneous opinions. This increased the validity of their answers by reducing the possibility of being influenced by the questionnaire's themes. Because this question seemed important for the study, it was asked again in a multiple-choice format to increase the answer's reliability and comparative value.

The content and format of all the surveys were tested first with three mock respondents who flagged formatting, layout, and wording problems. The resulting surveys appear to have been clear, easy to use and relevant because the participants left no questions unanswered, and their answers were complete, appropriate, and mostly in line with our working hypotheses. Suggested choices in the multiple-choice questions were validated by the fact that participants chose them. Very few respondents chose the "Other" response choice, which shows that the response choices were complete. Except for two questions that were common to the three surveys, the questions were answered properly, which may mean that they were clear.

2.4.2.2 Survey Document Format

For the operationalization of the questionnaire, I used a template in Word format that I had received from a researcher for a different survey. I used it for my drafts with the intent to transition the content to Survey Monkey, an online survey management company. I later discovered that my PDF (Portable Document Format file format) creator, Power PDF Advanced, version 2.1, from Nuance, had a form function that automatically transformed all the lines and large empty boxes in a Word document into text fields and changed all the small boxes into checkboxes. This method was a simple way to create PDF field forms that looked professional.

Another software function that I could use at the end of the survey, Export Data from Multiple Forms, consolidates data from the fields of identical forms into one Excel spreadsheet. This function seemed valuable and sufficient for my purposes. Thus, to avoid unnecessary costs in maintaining a Survey Monkey subscription for the duration of the study, I opted to stay with my Word/PDF solution.

However, opting to use the Word/PDF solution was costly. Formatting each questionnaire in Word was extremely long. It required an unending series of tries to get the

pagination, page layout, and form function right. By comparison, surveys on the Survey Monkey site are formatted automatically. The Word/PDF solution also led me to change the order of some questions for better page formatting, which made following my thematic progression and the design guidelines more complicated. I also gained the added burden of manually tabulating the data collected. The data consolidation function of Power PDF Advanced presented the data in Excel in codes, which was not readily understandable. Such coding may have been helpful for a quantitative study, but it was needlessly complicated for me. Here is an image of how the data appeared in Excel using this method.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1		ChkBox	ChkBox-0	ChkBox-1	ChkBox-2	ChkBox-3	ChkBox-4	ChkBox-5	ChkBox-6	ChkBox-7	ChkBox-8	ChkBox-9	ChkBox-10	ChkBox-11	ChkBox-12
2	TranslatorA-	Off	On	Off	Off	Off	Off	On	Off	Off	Off	On	Off	Off	On
3	TranslatorB-	On	Off	Off	Off	Off	Off	On	Off	On	Off	Off	Off	On	Off
4	TranslatorC-	On	Off	Off	Off	Off	Off	Off	On	On	Off	Off	Off	On	Off
5															
6															

Figure 1: Excel output with Power PDF's Export Data from Multiple Forms function

With Survey Monkey, I would have benefited from the ability to lock open-ended questions after receiving the answers.

2.5 Data Analysis

2.5.1 Qualitative, not Quantitative Surveys

Surveys are predominantly a quantitative data collection method. It was for this quantitative value that I developed them. Unfortunately, given the low number of study respondents, the surveys can only have a qualitative value. This means that the data does not have statistical value. My single case study, for instance, cannot be applied to the world outside the study's particular context. Moreover, the low number of respondents precludes any significance from being attached to the quantities of the results even though these results were obtained from the totality of the population studied. An actuary explained it this way:

> The way to show that results are significant would be through disproving a null hypothesis, which could […be] 0.5 probability of getting a response. 0.5 represents complete randomness as it gives participants [an] equal likelihood to [choose] either option. However, there are not enough responses to discern that this is not the case, as each team [translators, supervisors, and writers] has a probability of 1/4, 1/8, and 0.3125 of getting those results, assuming the probability is 0.5. These probabilities are too large to reject (>0.05). […] With this small a sample size, there is a non-negligible possibility that this is random chance, so you would not be able to discern [the] actual probabilities of these answers occurring. (Sam Baranek 2022, email message to author, April 17, 2022)

In other words, any trend, pattern, or correlation is possibly a product of random chance, rendering the validity and reliability of statistical analyses of our results null. A larger pool of participants would need to be surveyed to obtain results that would be conclusive for a broader population. Nonetheless, in qualitative research, each datum has value. Trends, patterns, and relationships can be tentatively recognized, especially when a logical hypothesis can account for them.

2.5.2 Data Analysis Method

To methodically gather and organize the abundant data related to the company's translation processes proper, I used the process worksheet (Appendix D). This allowed me to get an orderly view and understanding of the entire process and how each procedure fits in, with appropriate secondary data on software, for example. I also manually compiled the answers to each category of respondents on each related survey form. This compilation brought to view potential data patterns and trends. To further discover a logical pattern and trend, I reflected on the responses to the open-ended questions of the surveys and on comments made during the interviews, as well as statements made in company documents. I also made a note of interesting and recurring themes in the overall data.

Data reporting in a well-designed case study will rarely include all or even most of the data collected (Gagnon 2012, 78). The very nature of a case study is to gather a wide array of

information, some of which will not be directly relevant. Defining relevance too narrowly before gathering the data will impede the potential discovery of phenomena. Determining the applicability of gathered information must happen during the interpretation of the results when the researcher compares, contrasts, categorizes this way and that, and lets what is before him or her mature and give way to some phenomenon rising to the surface. Yet, this creative and inductive process takes time (Gagnon 2012, 77-78) and occurs before the data reporting phase of the research. For this reason, I do not report most of the data I collected, but only the data that helps me achieve the aim of this research, which is principally to describe Festo Didactic's commercial technical translation processes at their Quebec branch and, secondarily, to gain some insights on commercial technical translation.

3 Results

In this chapter, I present the results of my research on the translation processes of Festo Didactic's Quebec office. Describing commercial processes without touching on the entity that gave rise to them would be incomplete. To understand a commercial entity means to understand not only its history and profile but also its mission, its commercial drive and its strategic objectives, and even several beliefs and concerns of its employees. Therefore, I first give a brief overview of the history and profile of the Quebec office of Festo Didactic in section 3.1. Then I list general, specific and commercial company objectives in section 3.2. Next, I list perceptions about translation that I garnered from the company's documentation and from participant data in section 3.3. Finally, I describe the translation processes in detail in section 3.4.

As mentioned in the methodology section, while the data collected was broad, in keeping with case study methodologies (Gagnon 2012), only the data relevant to my research aim is here

reported, also in keeping with best-case study research practices. All the data collection tools, including the surveys, can be found in appendices D, E, and F.

3.1 History and Profile of the Quebec Branch of Festo Didactic Ltd.

The history of Festo Didactic's Quebec branch began in 1959 when Théodore Wildi, a professor working in the Electrical Engineering Department at Université Laval, founded Gen-tec to sell the electromechanical teaching modules he had designed for his classes, which had immediately been in high demand. Ten years later, he split the company into two and sold the industrial division to his partner. It has become today's Gentec. Wildi also sold the educational product division to a New Jersey firm. It hired Wildi as president and renamed the company Lab-Volt (Genois Gagnon 2014; Turcotte 2009). Although company headquarters were now in New Jersey, production mostly came from Quebec. In June 2014, Lab-Volt was acquired by Festo Didactic, a German company with a similar vocation founded in 1965. While Lab-Volt specialized in equipment and solutions to serve technical training needs, Festo Didactic focused on learning systems and training services ("Festo Didactic Acquires Lab Volt" 2014). The Lab-Volt brand was assimilated into Festo Didactic Ltd. but was retained for a range of products called the "LabVolt Series."

Today, Festo Didactic Ltd. is a leading producer of digital and non-digital technical and technological learning materials, which it translates and sells to over 30 countries. It has 61 offices in the world and employs over 800 people, of which 230 employees (almost one third) work at the Quebec location ("Curriculum I4.0 Receives Award" 2022). The company's products include training packages, learning factories, scaled-down simulators, software, and turnkey lab systems for both technical fields (such as mechatronics, communications, environmental technology, and water management) and industrial fields (such as factory, building, and process

automation). It also offers services such as the operation of learning centres and the design and equipment of classrooms and laboratories. Festo Didactic has built up an offering of 7,000 products in the form of software and learning modules, as well as 1,500 modular courses. In 2020, Festo Didactic generated sales of 143 million euros to its 56,000 customers, universities, research centres, vocational schools, the military, and industrial customers ("Curriculum I4.0 Receives Award" 2022; "Facts and Figures" n.d.)

Festo Didactic is a division of the Festo Group, an independent family-owned company founded in 1925 in Esslingen, Germany, that employs 20,000 people in 250 locations worldwide. Festo Group is one of the leading suppliers of automation technology in the world to over 300,000 industry customers in 176 countries, with sales of 2.84 billion euros in 2020 ("Festo Group" 2022; "The Festo Group" 2021). Festo is also known for the bionic robots it creates as a self-imposed research and development challenge ("Festo's New Bionic Robots Include Rolling Spider, Flying Fox" 2018; "Festo's Fantastical Flying Robots" 2016; "Festo's Newest Robot Is a Hopping Bionic Kangaroo" 2014.)

3.2 Company Mission and Strategic Objectives

Every company has a mission. Festo Didactic's principal mission can be described as the following sentence taken from its sales material:

> "[To develop] solutions for fast learning and successful retention for the entire spectrum of automation and technology" (Festo Didactic 2015, 3).

Some of the company's strategic objectives are also mentioned (emphasis mine):

> "[W]e have set ourselves the goal of *making learning ever more efficient*" (Festo Didactic 2015, 3).

> "[W]e have created a world of *learning tailored to your needs* for efficient study and guaranteed learning success."
>
> "What characterizes our learning systems is their *high practical relevance achieved through the use of real industrial components combined with the intuitive teaching of the educational content*" (Festo Didactic 2014, 1-3).

These strategic aims, that is, of focusing on learning efficiency, customized learning, and practical teaching approaches, contribute to the company's mission.

During our interview, Festo Didactic's executive corroborated these aims by stating that improving the effectiveness and efficiency of the company's pedagogical methods for each customer was a key company driver, mentioning that the planning for several strategies was underway to implement progress in this line. He stated that Festo Group's global culture is to strive for the theoretical ideal that is out of reach in every one of its activity domains to continually innovate solutions, and translation is no exception. By doing so, Festo Didactic discovers innovative methods to fulfill its mission. All the study's respondents similarly expressed that course effectiveness is crucial for accomplishing the company's mission. The continuous improvement of its pedagogical and technological methods was viewed as a priority.

When mentioning the company's customers, its international reach, its reputation on the market, and its expansion, company brochures allude to the company's commercial objectives, which can be summed up as the goal of selling more and generating profits.

> "*Being the world-leading provider* of equipment and solutions for technical education."

"One mission of Festo Didactic is to provide automation technology training *for manufacturing employees and our industrial customers worldwide*." (Festo Didactic 2015, 3).

"For several decades Festo Didactic has been *recognized worldwide* for the development of high-quality, intuitive learning systems for technical education."

"Festo Didactic *further strengthened its leadership position* as a supplier of technical education solutions *through the acquisition of Lab-Volt Systems*" (Festo Didactic 2014, 1-3).

(We see these commercial concerns tied to the mission of the company by words such as "leadership," "recognized," and "high-quality.") In our interview, Festo Didactic's executive mentioned the ever-present commercial concerns of time and cost. He stated that the company is always on the lookout to find methods to perform translation work not only better but faster and cheaper. Translators reported that they often reflect on whether they could work faster or more effectively, and that they continuously seek to streamline their methods and procedures to gain time.

3.3 Perceptions About Translation

Employee and management perceptions have an impact on work activities. They shape actions, procedures, and processes. In this section, I will explore respondents' perceptions about technical translation and their technical translation processes and procedures.

3.3.1 Technical Translation vs. General Translation

Both translators and supervisors were asked to reflect on technical translation as opposed to general translation, with the question, "How is technical translation different in practice from general translation at Festo Didactic?" Below is a summary of their responses:

Translators	Supervisors
1. General translation does not require terms to be researched. In technical translation, however, each technical term must be chosen according to its corresponding field of use. It's, therefore, necessary to research almost all terms. Furthermore, each piece of equipment has a specific name that must be used whenever referring to it. 2. In general, technical translation is more difficult than general translation, as technical texts can be difficult to understand even in the source language. Also, the terminology is more complicated and difficult to obtain. Much more research and consultation are required than in general translation. 3. In general, technical translation involves resources with language and technical knowledge and/or experience. For general translation, only language skills are required.	1. [Same as Translator 1] 2. We are in the education business; we need to use the right terminology and make learning fun. Grammar is very important.

Table 6: Technical Translation vs. General Translation

In each answer, the element of terminology research is present as a distinguishing factor between technical and general translation. All translators perceive that technical translation is more difficult to do than general translation. T3 states that technical translation requires language skills, and technical knowledge and experience, while general translation requires only language skills. T2 speaks of technical texts as being difficult to understand, and both T1 and T2 state that much research is necessary when carrying out a technical translation. S2 mentions that given the fact that they are in the education business, they need to use the right terminology and make learning fun, which underscores the pedagogical prerogative.

3.3.2 Characteristics of a Good Technical Translation

All three employee groups (translators, supervisors, and writers) were asked to describe a good technical translation. This question was placed before other similar multiple-choice or matrix questions in the surveys to maximize the spontaneity of the answers. The following table

lists every respondent's answers to the question: What characteristics should a good technical translation have?

Translators	Supervisors	Writers
1. Perfectly translate the meaning of the original sentence in as clear a manner as possible. Be technically accurate. Use the common terms of the relevant technical field. 2. Technical translations must be clear for the reader. Ambiguities must be avoided. The technical terms used must be consistent. The translation must be free of "false friends." 3. Appear that the text was originally written in the target language, respecting 100% of the meaning of the source language.	1. [Same as Translator 1.] 2. Consistency of terminology so the student does not have too many questions when reading two synonyms.	1. It must convey the original language contents as exactly as possible without introducing any error or distortion. 2. It should be accurate and respect appropriate and currently used terminology, and respect all the other characteristics of a good general translation. 3. It should convey the same information as the original text. For technical texts, style exact translation is less an issue than meaning. Measurement units and technical terms should also reflect norms and usage of the target language or country.

Table 7: Characteristics of a Good Technical Translator

These responses reveal that accuracy of content (preserving the meaning of the source) and clarity of content (ensuring that the meaning is clearly conveyed in the target) are the two principal concerns of translators and supervisors. Indeed, they state the need to "perfectly translate," to respect "100% of the meaning of the source language," to ensure clarity and consistency, and to avoid ambiguities. Writers, on the other hand, mostly state that the source content should be conveyed accurately. Writer 1 especially mentions the need for the translation not to introduce "any error and distortion." Writer 3 mentions that meaning must be preserved over the style of the original. Both Writer 3, Translator 2, and Translator 3 underline the importance of respecting the target language and target norms.

3.3.3 Important Elements of a Technical Translation

The survey question that follows gives a better understanding of how each respondent sees the importance of separate elements of a technical translation. This is a matrix question with a three-point scale, plus the "I do not know" answer choice. Thus, the respondents are constrained in their responses, as I wanted to see whether there was general agreement on perceptions of technical translation elements. As seen below, the answers of each respondent are tabulated in a table where T, S, and W represent "translator," "supervisor," and "writer," respectively. They are colour-coded to make it easier to spot potential trends: translators appear in red, supervisors in blue, writers in black, and the supervisor who is also a translator appears in purple. This way of identifying each participant will be consistently followed in this section. The replies answer the following question: "How important do you consider each element in a **technical translation**? (Check one for each row)."

	Very important	Of average importance	Not very important	I do not know.
Accurate numbers	T1 T2 T3 S2 W1 W2 W3			
Accurate terminology	T1 T2 T3 S2 W1 W2 W3			
Appears as if it is not a translation	T1 T2 T3 S2 W2	S2 W1 W3		
Clear (easy to understand)	T2 T3 S2 W1 W2 W3	T1		
Faithful to the original	T1 T2 T3 S2 W1 W2 W3			
Literal translation		T3 S2	T1 T2 W1 W2 W3	
Same effect on the reader as the original	T1 T2 T3 S2 W1	W2 W3		
True to the message	T1 T2 S2 W1 W2	T3 W3		
Word-for-word equivalence			T1 T2 T3 S2 W1 W2 W3	

Other: _____

Table 8: Important Elements of a Technical Translation

"Accurate numbers," "Accurate terminology," and "Faithfulness to the original" are undisputedly perceived as essentials for a technical translation. I would like to qualify "faithfulness" as faithfulness to the original *meaning* or original content and not to the original style or form. I make this assertion since "Literal translation" is seen as being of average importance or not very important. This also means that the respondents are not contradicting themselves when stating that faithfulness to the original is as important as clarity. Target-based characteristics, such as "Appears as if it is not a translation," "Clear," "Same effect on the reader as the original," and "True to the message," are also rated as very important by most, except on average by a couple of respondents, who rate these characteristics as "Of average importance." Only one translator sees the clarity of the text as only of average importance, although in the previous question, the response is that the original content must be rendered in "as clear a manner as possible." We can conclude that there is general agreement in the responses, which may mean that some translation choices are seen as obvious by the respondents.

3.3.4 Choice of Competing Views on Quality Technical Translation

With another question, I sought to ascertain what views or philosophies on translation each participant may have. The question and the summary of responses read as follows:
"Let us suppose that each row of boxes represents a continuous spectrum between two views on translation quality. Place an X in the box that indicates where you feel **good technical translations** should be concerning those two views. If you are not sure about the meaning of these views, **please answer based on your intuition**. (If you do not understand at all, kindly select 'I do not understand.')"

Literal translation				W1		W3	T2 T3 S2	W2	T1	Idiomatic translation	I do not understand. ☐
Word-for-word equivalence							T3 W1	T2 W2	T1 S2 W3	Sense-for-sense equivalence	I do not understand. ☐
Message	T1 W3		W1 S2		T2 W2		T3			Form	I do not understand. ☐
Easy to understand					T2 W1 S2	T1	T3	W2		Precise	I do not understand. ☐
Same effect on the reader			W3		T2 S2		T1 T3 W1 W2			Faithful to the author's message	I do not understand. ☐
Close to the original					T2 W1		T1 T3 W3	W2 S2		Reads like an original	I do not understand. ☐
Overt translation (Looks like a translation)					W1	W3	T3	T2 W2	T1 S2	Covert translation (Looks like an original)	I do not understand. ☐

Table 9: Competing Views

Because no respondent checked the box "I do not understand," we can conclude that there is at least intuitive knowledge of the views listed. At first glance, there is less agreement in this table than in the previous one. However, there is a surprising harmony of responses when considering that there was no explanation of the meaning of the views and that this matrix has a nine-point scale, that is, nine possibilities of choices in each row. It is interesting to note that target-oriented translation objectives, such as idiomatic translation (as opposed to literal translation), sense-for-sense equivalence (as opposed to word-for-word equivalence), reads like an original (as opposed to close to the original), and message (as opposed to form) were preferred over source-oriented considerations. Several respondents chose the middle ground between competing views. Row 4 likely does not contradict previous results, which stated that the clarity of the translation is crucial. It appears to be less important here, but this is probably

because it was juxtaposed against translation precision. In technical translation, precision is of utmost importance.

As for the last three rows, we see Writer 3, again, as having a more target-oriented approach than others in his view of translation since preference is on the effect of a translation on the reader over the faithfulness to the source author's message. At the same time, four respondents decided that faithfulness to the author's message was more important than the effect on the reader. Nonetheless, in the following row, most of these same respondents chose "Reads like an original" when this response was opposed to "Close to the original." On the last row, there seems to be even less hesitation when "Looks like an original" is opposed to "Looks like a translation."

3.3.5 Concerns

Apart from personal definitions of quality, the personal concerns of team members can reveal other competing or complementary perceptions, whether conscious or unconscious. I asked both translators and supervisors how often they worried about certain aspects of their work, although the questions were differently structured. The writers' survey did not have these questions.

To the translators, I asked: How often do you **worry** about the following?

	Never	Rarely	Sometimes	Often	Always
Given the limited time to complete this translation, is the quality of my translation sufficient for its use?	T1	T2 T3			
Will the quality of this translation satisfy the client?		T2		T1 T3	
Will the users of this translation (ex.: teachers, assembly technicians, students) notice that it is a translation?	T3	T1 T2			
Will the users of this translation understand the terminology used?		T2 T3			T1

Am I using translation best practices?	T1		T2	T3	
Can I work faster?		T2		T3	T1
How can I know whether my translation is good enough?		T2 T3	T1		

Table 10: Translator Concerns

To the supervisors, I asked: How often do you **worry** about the following?

	Never	Rarely	Sometimes	Often	Always
Is the level of quality in this translation the best that we can produce?					S1 S2
Will the quality of this translation satisfy the client?			S2	S1	
Will the users of this translation (ex.: instructors, assembly technicians, students) notice that it is a translation?			S2	S1	
Will the users of this translation understand the terminology used?				S1	S2
Are we taking too long to translate?			S2		S1
Are we using too many resources to translate?	S1		S2		
Are we using too few resources to translate?		S2		S1	
How can we improve translation quality?			S1		S2
How can we speed up translation?				S1	S2
Are we using translation best practices?	S1			S2	
Are we paying too much for this translation?			S1 S2		

Table 11: Supervisor Concerns

Looking at both tables, we can hypothesize that supervisors may worry more often than do translators, probably on account of their greater responsibilities. The Often and Always columns give an idea of the principal concerns of the team members. The “Sometimes” column suggests that there are lesser worries.

The supervisors always indicated they worry about whether the quality of the translation produced is the best that the team can produce. This worry is most likely related to the company's culture of striving for the ideal, as mentioned in section 3.2. One supervisor always worries, and one sometimes worries about how to improve translation quality. One often worries, and one sometimes worries whether the quality of the translation will satisfy the client. Time considerations ("Are we taking too long to translate?" "How can we speed up translation?") are also common concerns. We can also see that it is a concern whether users understand the terminology used or not and whether users notice that the translated text is a translation.

In the translator table, T1, who is also S1, obviously has identical or similar worries: Will the users understand the terminology used? Can I work faster? Will the quality of this translation satisfy the client? T1/S1 also sometimes worries about how to know whether one's own translation is good enough – an important assessment question.

T2 only sometimes worries about whether the best translation practices are being used, while T3 worries about this often. T3 shares T1's concerns about whether the quality will satisfy the client and whether the work can be done faster. However, T3 does not worry about users understanding the terminology. This may mean that the understandability of a translation is not equated with client satisfaction or that the translations are deemed clear enough for the user. The fact that two translators often or always worry about whether they can work faster may indicate that they may need resources to help them speed up their work, such as digital access to source and target language reference books, dictionaries, and subject-matter textbooks, all of which were unanimously judged very useful, and mostly judged as not easily accessible by writers and translators alike in another question. The fact that two translators sometimes or often worry

about whether they are using translation best practices may indicate a need for training in translation methods.

3.3.6 Safety Risks

To find out how respondents perceived translation in terms of implied safety risks, I asked, "Considering sources of risks to physical safety, how much do you agree that translated texts add an additional layer of safety risks? (Check one.)".

Mostly agree	Agree	Neither agree nor disagree	Disagree	Mostly disagree
T2 S2 W2	T1	W3	T3	W1

Translators	Supervisors	Writers
1. We must not add any hazard in the translation, or misinforming the reader about potential hazards. However, hazards are usually indicated very clearly, and so they are hard to mistranslate. 2. Technical translations may refer to the operation of hazardous equipment. Incorrect interpretation in translation can endanger the health of users 3. A good translation cannot add a new layer of risk, unless that risk is already in the source language.	1. Same as Translator 1. 2. It is important to do some review reading before making the course available.	1. If the original text is well written, and the translation of the text is accurate and properly validated, then I see no reasons for translation to add a layer of safety risks. In short, do your job correctly! 2. Texts concerning safety should be clear and instantly comprehensible to the reader and have no ambiguities. 3. We try to be concise and clear when it impacts safety. Nevertheless, there are some residual risks.

Table 12: Safety Risks

The respondents' responses diverged regarding their views on safety risks. A few explanations are possible. They may not have thought extensively on this subject. I may have made a mistake in designing this scale. They may think the question pertains to their own work. Or perhaps another cause. The scale appeared as "mostly agree, agree, neither agree nor disagree,

disagree, mostly disagree." The more logical order would have been "agree, mostly agree, neither agree nor disagree, mostly disagree, disagree."

T2 and S2 mostly agreed, and T1/S1 agreed that translations add risks to physical safety. Among the writers, only W2 agreed with them. Nonetheless, writers and translators were split on their answers. T1/S1 and S2 stated that translation quality assurance (TQA) measures minimize those risks, while W1 states that coupled with good translation work, TQA measures eliminate them. T1/S1 added that because hazards are usually clearly indicated, mistranslations are unlikely. The translator that mostly agrees that translations carry safety risks explains that "[t]echnical translations may refer to the operation of hazardous equipment[; thus,] incorrect interpretation in translation can endanger the health of users." T3, who disagrees, states that a "good translation cannot add a new layer of risk unless that risk is already in the source language." However, the adjective "good" in the comment betrays the fact that the process of translation must indeed carry risk since not all translations are good. W1, who also disagrees, states that "[i]f the original text is well written, and the translation of the text accurate and properly validated, then I see no reasons for translations to add a layer of safety risks. In short, do your job correctly!" With the explanation provided, and by starting with the word "if," the respondent reveals four sources of potential errors or risk: errors in the original text, lack of clarity of the original text, an inaccurate translation, and inadequate TQA measures.

3.4 Processes

In this section, I present the two core translation processes of the Quebec branch: one for French or Spanish, representing roughly 70% of the branch's translation work, and one for other languages. Both of these processes are used to produce the entire range of documents needed for the company's core operations—the production of its customer solutions: textbooks, teacher manuals, workbooks, guides, worksheets, exams and tests, simulation software and other

software interfaces and help files, web-based training packages, operation manuals, equipment markings, screen prompts, etc., all of which are technical in nature with a pedagogical vocation. The student and teacher manuals are identical, except that the latter has the answer key. It is useful to recall here that we define technical texts as those relating to the use of a technology or the application of a scientific theory (Olohan 2016, Byrne 2006). While Festo Didactic produces many other types of texts, such as financial statements or marketing materials, which are performed by different teams with different processes, our study focuses exclusively on texts that make up its core commercial operations: the training products sold to customers. Of note, a localization project can be composed of any of the following: software, documentation, online help, training materials (training guides, presentations, multimedia), marketing materials (website, collateral materials, multimedia), or technical support knowledge base (Levitina, 2011, 99), and often documentation and training materials supplement core product software. In Festo Didactic's case, the training materials and documentation often constitute the core.

In terms of outsourcing translation work, on rare occasions, the Quebec office will outsource translations into French or Spanish directly to an LSP. This occurs when it needs to free up resources for higher priority projects, when it considers a project too complex, or when it has too few employees to complete a project in a given timeframe.

In this section, I first introduce how a project is initiated at Festo Didactic before presenting the two translation processes. I then give information on pertinent elements, for example, the translation team, hiring practices, and terminology management. The data used for this section was collected through the three interviews I held with members of management, the work observation session I conducted with one employee, the three employee surveys I carried out, and the company's own process map.

3.4.1 Project Initiation

Given that Festo Didactic offers tailored learning solutions, its operations are project driven. This means that each new product or service delivered is considered a unique event. This event starts when sales and marketing specialists and product designers consult with potential clients to discover their needs for a learning solution. The desired learning outcomes and the target students are precisely defined. The company then decides on the solution that needs to be created, customized, or adapted through translation. A multidisciplinary team works iteratively and closely with the client and all stakeholders to design the product/service mix that will satisfy their pedagogical requirements. This work defines the product scope, including the requirements necessary for successful project completion. Once the product scope and project scope are agreed upon, and the contract is signed, production at the plant begins. Some deliverables might include specialized equipment, simulators, software, digital twins, online courses, student and teacher manuals, assembly or repair manuals (for repair technicians at the university or training centres), and pretests, tests, post-tests, and exams. The writing phase sometimes overlaps the design phase.

Authoring of technical content is performed in Cosima, the company's Content Management System (CMS). It is designed for technical authoring and documentation management. It works by digitalizing information and editorial processes and allows for the automated and legally compliant production of document variants in any language. It is based on eXtensible Mark-up Language (XML), a language useful for exporting and importing data from one software to the next as it stores text in plain text and makes data independent of any platform. The CMS is integrated with Across, the company's Translation Management System (TMS). A TMS is a software that houses databases in which previously translated segments are paired with their source segments. Festo Didactic's versions of Cosima and Across are the server

versions, which allow for the centralization of the company's authored content, translation memories, machine translation engine, and glossaries.

Graphics for projects are created with CorelDraw, a graphic design application that creates CDR files (at Festo Didactic, CorelDraw is embedded into Cosima). Each language is stored on a different layer of the graphic. Layers are levels in graphic software in which an object, image or text can be placed. This makes it easier to manage graphic design projects by being able to manipulate whole layers instead of separate elements, such as, in our example, all text in a specific language. These CDR files are exported in the Scalable Vector Graphic (SVG) file format, a format valuable for data transfers and for maintaining the layers of vector graphics.

3.4.2 Translation Process for French and Spanish

The chart on the following page shows the translation process used for translations into French and Spanish.

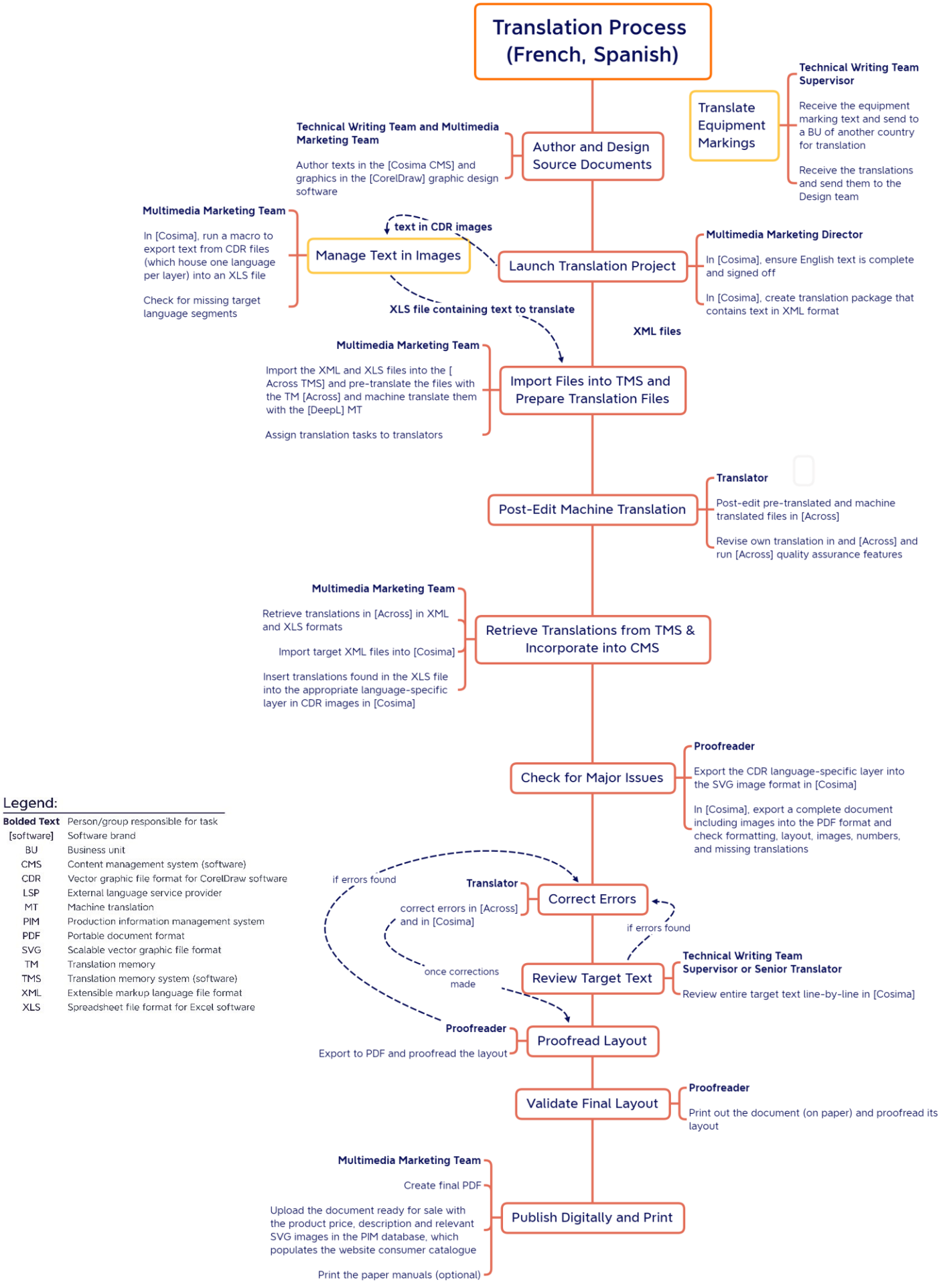

Figure 2: Translation Process for French and Spanish

The company starts its translation process as early as possible in its work cycle. Indeed, the task of translation is fully integrated into the company's learning solutions production schedule. This is further evidenced by the fact that it has an in-house team of translators. Translation is not an add-on, as is often the case in industry (Drugan 2013). By starting translation work early, Festo Didactic avoids unnecessarily rushing its translators, giving them time to do proper terminological research and higher-quality work. This way, translators can also correct errors in the source text before it is too late in the production cycle (Drugan 2013, 20).

Before the translation process officially begins, product markings and displays are translated into every target language simultaneously by a senior translator, often at the beginning of the writing phase. The translation process proper starts when the multimedia marketing director (MMD) receives a directive to start a translation project. The MMD first verifies in Cosima if all the source text elements are in their final phase of creation and are signed off. The MMD then creates a translation package in Cosima, which consists of exporting all the text for translation in XML file format. In Cosima, the multimedia marketing team selects the related CDR files and runs a macro that automatically pulls the text found in these files to populate an Excel file (XLS). The team then imports the XLS and XML files into Across, where they are pre-translated using the translation memories (which pulls up similar previously translated segments) and where they are machine translated with DeepL (for the remaining segments). Each file is then ascribed to a translator based on the language pairs of the project (into French or into Spanish). Translators receive the appropriate files in their client versions of Across and begin to post-edit the TM-retrieved segments and the MT-produced segments. Translators then revise their translations and perform QA checks in Across, after which they mark them as complete. The files are then exported from Across into XML files that are imported into Cosima. The

multimedia marketing team manually enters the translations from the XLS file into the language-specific layer of the CDR files in Cosima. In Cosima, CDR files are exported in SVG format, at which point they can serve as standalone images or be incorporated into a document.

A complete document (containing text and images) is exported in PDF format. A proofreader then performs a first validation of the document by comparing it with the source text and checking for major issues: missing translations, numbers, title sizes, etc. If there are mistakes, the proofreader asks the translator to make the necessary corrections in both the CMS and the TMS, and the process starts over. Once the proofreader finds no major issue, a senior translator reads the translation in its entirety in the CMS. Mistakes are flagged by the proofreader, and corrections are performed by the original translator in both the CMS and the TMS. After the corrections are made, the file is again exported into PDF format. The proofreader makes a thorough verification of the formatting and the layout of the PDF document. As previously, any correction must be performed in both systems (CMS and TMS) by the translator. Once this step is complete, the document is printed out on paper, and a proofreader carries out a final validation.

Once the translation has been thoroughly checked, the final PDF is created, and it is uploaded onto the Product Information Management (PIM system) along with metadata, such as product information and pricing, as well as relevant SVG images. It is used to manage all the company's product and marketing information and facilitates its streamlined publication in different languages and through various channels, such as on the website and in its catalogues and brochures. Manuals can also be printed internally and delivered to the client in paper format.

3.4.3 Translation Process for Languages Other Than French and Spanish

The next chart shows the translation process used for languages other than French and Spanish.

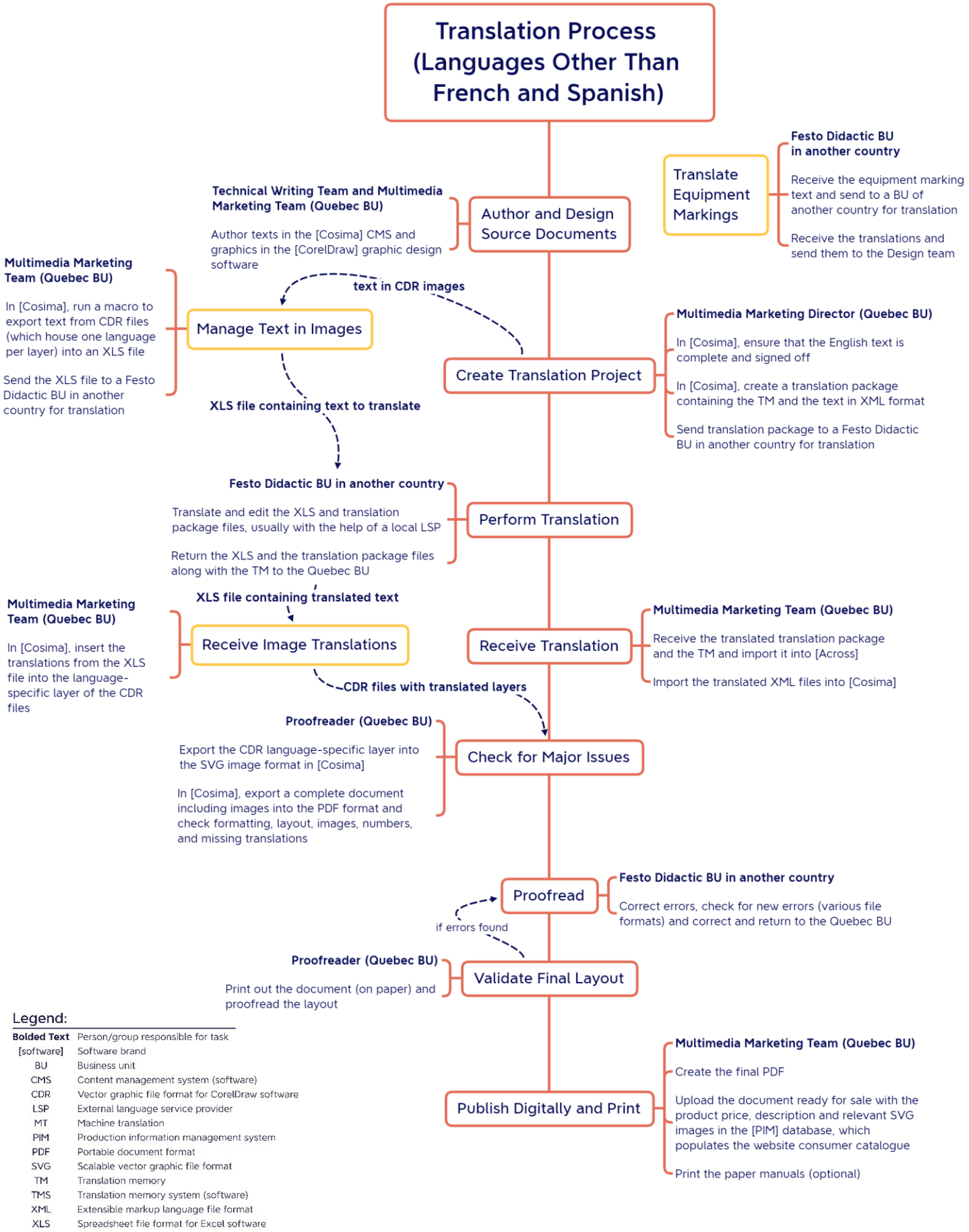

Figure 3: Translation Process for Languages Other Than French and Spanish

In this process, the multimedia marketing director sends the translation package created in Cosima and which contains XML files to an international office of the company (which Festo calls a business unit [BU]) based on the language pair needed. For instance, the business unit in Poland would be chosen for a translation into Polish for the Polish market. Text in CDR files is extracted with the help of a macro and automatically inserted into an XLS file that is also sent to that same BU.

The international BU translates the documents independently of the Quebec branch. It often hires an external language service provider (LSP) based on the LSP's competence in the technological domains and its agreement to return the translation memory generated with the translation. Once this process, which includes revision and proofreading, is complete, the BU returns the translated package with the translation memory and the Excel file to the Festo Quebec office. There, the multimedia marketing team imports the XML files and the translation memory into Across and the XML files into Cosima. It also manually enters the translations from the XLS file into the correct target-language layer of the CDR files in Cosima.

A complete document is exported in PDF format and checked for major issues, such as missing translations or incorrect numbers. If problems are found, the international BU is asked to make the necessary corrections. Once the modifications are made, the same importing process occurs in Across and Cosima. The proofreading continues until there are no more major errors. A PDF is created to be verified by the international BU. Subsequently, a final PDF is created and verified before publication in the PIM.

3.4.4 Language Service Providers

Because of Festo's confidential processes, hiring agencies is difficult. Quebec's management chose its last two external LSPs based on the following criteria: Festo Group

recommended it, they offer good translation quality, and they offer a good price. Criteria that were not particularly taken into account were certifications, such as the International Organization for Standardization ISO or the European Standards (Europäische Norm [EN]), advertised subject-matter competence, and website testimonials.

One LSP that had been hired did not always meet expectations in terms of its knowledge of the subject matter or the writing style aesthetics. However, it generally met and sometimes exceeded expectations regarding cost, the creation of terminology banks, the use of proper terminology, respect for Festo Didactic's guidelines, speed, timeliness, and translation accuracy. In the past, Festo Didactic attempted to obtain better prices by hiring freelance translators directly (without working with an agency). However, managing freelance translators was time-consuming, and the quality of the freelancers' translations was unpredictable.

3.4.5 Quality Assurance and Regulations

At Festo Didactic, quality assurance (QA) measures are incorporated in every phase of the design, writing, and translation process. For instance, it involves hiring writers and translators with a solid understanding of scientific and technical concepts (see 3.4.7), language proficiency and experience in writing. It also entails educating both teams on particular products through communication with the product designers and through physically manipulating components when necessary.

The content management system has QA features that writers use to eliminate errors in their text. QA features built into the translation management system (Across) allow translators to verify grammar, punctuation, and spelling, as well as many other machine-detectable errors, such as untranslated segments or identical segments translated differently, etc. The translators have access to a limited number of digital reference books housed on the company's secure intranet,

which gives them ready access to verify concepts and terms, in effect, increasing the quality of their term choices. Several QA measures are part of the process, as seen on the charts in sections 3.4.2 and 3.4.3: initial check (for major issues), complete unilingual review of the target text, proofreading, and validation of the final layout. The unilingual review also serves to assess the overall quality of the post-edited content. To do so, it does not apply error typologies, such as the LISA Quality metric, or the SAE J24504 in its assessment of MT post-editing, a trend Ana Guerberof Arenas noticed in companies who integrate higher-quality MT into their standard translation processes (2019, 8).

Product characteristics and symbols follow different norms in different countries, i.e., electronic symbols and voltages. Different elements of the product solution are verified by internal certification labs, which certify that product standards of the target locale are followed: namely, the Canadian Standards Association (CSA) for Canada, the Conformité européenne (CE) for Europe, and Underwriter Laboratories (UL) for the USA. Once the equipment or software is ready, and the courses or manuals are published either on paper, digitally or online, the implementation phase is launched. Equipment is installed and tested at the client's prescribed location. Festo Didactic specialists train teachers on how to use the solution. Finally, a follow-up is conducted by the after-sale customer service.

3.4.6 Translation Team

As mentioned in the methodology section, the translation team is made up of two full-time translators, one supervisor, the multimedia marketing director, and one freelance translator. This freelance translator is also the full-time supervisor of the technical writing team, which is made up of six technical writers. Translators generally write in their native language, while two out of three writers work in their second language. One translator sometimes translates into a

second language (with native or bilingual proficiency) and into a third language (with full professional proficiency).

3.4.7 Hiring Practices

Sound hiring practices are an important component of quality assurance. The following question posed only to the supervisors about preferring candidates who demonstrate strong linguistic knowledge versus scientific and technical knowledge for various positions aims to discover the importance placed on each for different job functions. Question: "When hiring team members in the table below, do you prefer a candidate with strong linguistic or scientific/technical knowledge? (While a perfect mix of both may be ideal, which one would you prefer if one were necessarily stronger? And to what degree?)"

	Excellent Linguistic Knowledge + Basic Technical Knowledge	Good Linguistic Knowledge + Average Technical Knowledge	Average Linguistic Knowledge + Good Technical Knowledge	Basic Linguistic Knowledge + Excellent Technical Knowledge
Machine translation assistant (performs clerical work)	S1	S2		
Machine translation post-editor (corrects the DeepL translation)	S2		S1	
Proofreader (checks the final layout and typography)	S1	S2		
Technical writer			S1 S2	
Terminologist		S2		S1
Translation project manager				S1 S2
Translator		S1 S2		
Reviewer (unilingual revision)	S1 S2			
Reviser (bilingual revision)	S1 S2			
Other:				

Table 13: Hiring Practices

The answers show that supervisors believe technical knowledge is preferred over linguistic knowledge for technical writers, and linguistic knowledge is preferred slightly over technical knowledge for technical translators. Supervisors disagree about terminologists. One sees the work as needing excellent technical knowledge and basic linguistic knowledge, and the other takes a more balanced view, preferring the good linguistic and average technical knowledge combination. There may be a trend in which earlier phases of the translation process are seen as requiring more technical knowledge, which is gradually replaced by linguistic knowledge as the process progresses to completion. Supervisors disagree about MT post-editors. One supervisor believes that excellent linguistic knowledge and basic technical knowledge are the best compromises, while the other believes that average linguistic knowledge and good technical knowledge are preferable. Unfortunately, I may have inadvertently confused the question by stating that the MT post-editor merely *corrects* the DeepL translation, oversimplifying the complex task of post-editing. This may have skewed the answers.

Of interest, S1 holds a science degree, while S2 holds a degree other than science and language, which may have influenced their answers. Based on the current team makeup, writers and translators, who, as mentioned before, mainly work as MT post-editors, are hired based on their scientific knowledge first and their linguistic credentials second since most of them hold science and not language degrees.

3.4.8 Training

I included questions about training because I consider that the translators' (and writers') skills are at the core of any translation (and writing) quality effort and that improving these skills is an important quality assurance measure. Since translators and writers both benefit from training opportunities at Festo Didactic, which range in variety. Translators and writers judged

that software training would be very useful for the software they use daily, namely Across (for translators) and Cosima (for writers and translators). Quality assurance and terminology software training was rated slightly more useful by the translators than by the writers, but all indicated that it was useful. Translators rated the usefulness of QA software training highly. Writers did not rate such training as useful. This may be because writers already use Cosima's QA features and may not have a need for a standalone QA application. Usability training was considered useful by all groups. Usability is a key function of technical documents, which "must enable users to perform a given task" (Olohan 2016, 51-52) and thus be clear, concise, easily understandable, and engaging (Olohan 2016, 51-52; Dancisin 2015; 31-36). Language training was rated as very useful by the writers and translators. Still, supervisors thought that training on only revision and proofreading methods, terminology research and translation methods and strategies were useful. In contrast, they rated language development, such as improving vocabulary, grammar, and style, as not very useful. Training on technical or scientific subjects was rated as useful by all.

3.4.9 Style Guides

Like many companies, institutions, and organizations, Festo Didactic has style guides. Source language style guides improve consistency and uniformity, and compliance with regulations and standards. They can also reduce word counts, disambiguation, translation queries, […] and delays (Levitina, 2011, 107). Thus, they can reduce costs throughout the many projects that emerge for translation and localization in a variety of target locales. Target language style guides reduce time by pre-empting questions, especially for managing consistency between related projects and translators (Levitina, 2011, 107). Compared to other components of a translation or localization project, training materials and help systems are usually the most

voluminous in terms of word count (Levitina, 2011, 99). For Festo Didactic, it means a large volume of words.

Festo Didactic translators must follow some of the same directives as writers, including Festo-specific style guides and naming conventions. The writers responding to the surveys reported that they followed didactic guidelines, while translators reported that they observed terminology guidelines.

Festo Didactic's writing and multimedia departments practise internationalization strategies, which are methods of producing content that facilitate its localization, that is, its adaptation to different locales, languages, and cultures. They avoid negative country-specific or cultural references in images and text. They reduce the length of technical documents by using fewer words and more illustrations. They leave additional white space to allow for easier formatting when translating into lengthier languages. They implement a form of controlled authoring. They also minimize the quantity of text that needs translation in images and equations.

The writing, translation and multimedia marketing teams must respect country-specific regulatory requirements as per the information that needs to appear on equipment and in books.

3.4.10 Document Management

Several translation projects are launched every week. The large quantity of documents produced requires a special document management infrastructure, which the company's CMS (Cosima) and TMS (Across) provide. In the CMS, the source language of the content is always identified as such, and the translated content is relegated to "slave" status. This means that it is identified as being auxiliary content that is never to be modified first. Content version history is recorded with the help of SourceSafe. For example, the last Spanish version in the database might be linked to the source version created on July 10, 2014, at 8:12 AM. If the Spanish

version needs to be modified, all modifications made in the source version between 8:12 AM on July 10, 2014, and the present must be made in the Spanish version.

A strict methodology is followed to keep track of all the different content versions to avoid producing translated manuals that do not entirely correspond to the latest version and, more importantly, to the product itself. If clients call the company for clarification, Festo Didactic first asks what version of the manual they have on hand. Their answer must include whether it is the paper or the digital version and the following dates:

- The copyright date: this date never changes; it is the oldest date of the three
- The date of the version: this date changes every time content is modified
- The date of printing: this date changes with each printing

All updates and translations are thoroughly documented with dates and signatures.

3.4.11 Terminology Management

Terminology is managed slightly more consistently by the writers than by the translators. Terminology is managed individually. The company-wide terminology database (also called termbase) holds relatively few terms. A need for increasing the size of this database was mentioned by the survey respondents. The two factors that prevent translators from populating the termbase are 1) the procedure required by the company to add terms is long; it stipulates that many fields need to be completed for every term entry, and 2) translators have limited time to complete their work which prevents them from following the procedure to add new terms. The quality level of the company terminology database was rated slightly lower by the translators than by the supervisors.

Researching terminological entries was also stated as being a long process. Respondents mentioned that one good way to facilitate terminological research would be to have easier electronic access to academic books, dictionaries, or other specialized books on technical and

scientific topics in both the source and target languages. All translators and writers deemed it very useful to have easy access to books on technical subjects, specialized and general dictionaries, and glossaries and terminology databases in the source language for the authors and in both the source and target languages for the translators. They considered access to grammar books and national writing style guides as very or fairly useful. Translators did not know whether collections of unilingual or multilingual texts for terminology research were useful (such as the British National Corpus or BNC and WebCorp ["English-Corpora: BNC" n.d.; "WebCorp: The Web as Corpus" n.d.]). Translators and writers already have access to several source language books on technical subjects.

3.4.12 Terminology Adequate for Users

Because some technical terms may be unknown to the readers of Festo Didactic's texts, and they might refer to the same concepts using different words, all respondents were asked what methods they used to increase the likelihood of using the same terms that the readers of their texts would use (such as instructors and students). Respondents stated that it was important to maintain consistency of terms in a group of documents covering the same topic. Supervisors were worried that the users would not understand the terminology. Translators and writers were not only conscious of the importance of using the correct, established terms in their respective texts by consulting reference documents but also stated various methods to ensure reader comprehension:

- use the most common term when more than one exists
- consult every authoritative reference, including textbooks on the subject, to ensure that the new vocabulary gained by the student is correct
- provide a common synonym in parentheses
- provide an explanatory note where there may be a risk of ambiguity (translator comment: this means that the translator would add content for clarity purposes)
- check terms on search engines such as Google to see their relative usage

3.4.13 Feedback

Feedback on the quality of translations is not systematically requested from clients, end users, reviewers, translators, translation agencies, terminologists, or writers. It is only sought out systematically from international sales offices who provide feedback by email on the work of the local translation firms they have hired. Feedback on the quality of translations is given as needed to sales offices, translators/translation agencies, DTP specialists, reviewers, terminologists, and writers.

4 Discussion

"All things are lawful for me, but all things are not expedient" 1 Corinthians 10:23.

While in the previous section, I described Festo Didactic's translation processes in their Quebec office, in the following section, I will discuss a few general concepts and themes that emanate from them and propose how we might consider the practice and context of commercial and technical translation.

4.1 Introduction

Businesses exist for a purpose. The protracted debate on whether a translation is best when it is covert, overt, foreignizing, domesticating, dynamic, literal, sense-for-sense, formulaic, or original can, especially in a commercial setting, be helped with the addition of purpose to the translation equation. Everything is permissible: a translator can choose to focus on the precision of the content or to preserve the original author's style, the tone, the modes of expression, the form of the words, the rhythms, the sounds, or the impact on the reader. The beauty of translation is akin to the beauty of writing: it is creative. But keeping the purpose of the translation in mind should make at least some choices less perplexing because some, when considering why the translator is translating in the first place, are bound to be superior to others. If I am translating,

say, a pedagogical manual on wind turbines, I might want to focus on the content's precision, the clarity and consistency of the terms and the sentence structures to the detriment of the author's style or the word forms. Inevitably, "if a translator emphasizes one aspect of the source text, he will have to suppress others" [Reiss and Vermeer 2014, 38]). The purpose of the translated text thus orients my efforts.

4.2 Skopos Defined

Skopos theory is presented by its founder, Hans J. Vermeer,[3] as a subcategory of a general theory of action, which states that all actions, by nature, aim to achieve a goal, a purpose, or a skopos[4] and are governed by it, "translational" action being no exception (Reiss and Vermeer, 85-86). Since he sees discourse as "an instrument for pursuing intentions," the act of translating must be full of intent and therefore be a sociological undertaking, meaning that its aim is to act on the reader. In order to be most effective, this action must appear socially reasonable through compliance with the situation's norms. Thus, any act, namely translation, is seen as a function of a (target) situation and of its (target) readers (86). The skopos rule states that any act is determined by its purpose, its skopos. And a secondary skopos rule states that any purpose is a function of its intended recipients (90). Thus, translational skopos cannot be determined without recipients: "If a target audience is not known, it is impossible to decide whether or not a particular function makes sense for them" (91).

Since each translation is undertaken for a reason, it is no longer solely bound to the source text through the varied definitions of equivalence, but it is only bound to that for which it

[3] Christiane Nord, in her preface to her translation of Reiss and Vermeer's book *Towards a General Theory of Translational Action*, explains that Hans Vermeer is the founder of skopos theory and the author of the first part of the book, in which skopos theory is explained.
[4] Words used by the theory's authors as synonyms, and although Nord lists some distinctions [1997, 27-28], we will ignore these for the sake of simplicity.

was mandated: the skopos. The theory's thrust is that translations are characterized by the future function or skopos of the target text in its (target) sociocultural and situational contexts. This function is determined more by the needs or wants of the initiator as a function of the target culture norms (Reiss and Vermeer 2014, 85) than by the nature of the source text or the reception of the source text by its readers (Nord 2005, 9). Thus, new forces compel the translation's orientation and the translator's choices. Christiane Nord clarifies that these functionalist[5] considerations were never meant to replace the notion of equivalence but to reframe it as one choice among several (2022). Equivalence is placed in the broader concept of the offer of information. In practice, commissioners are free—and sometimes avail themselves of the freedom—to request the adaptation of certain aspects of the source text, to only translate parts of a text, and to ask for certain elements of the text to be rendered more prominently. The intention of the commissioner, who is the person mandating the translation, is the key that defines the whole set of quality parameters. He can determine that the objective of the translator's activity is a target text that is equivalent to the source text while defining how equivalence is to be measured. While I generally agree with this theory, I recognize that for translations to be so called, there needs to be a link to the source text. This link may not be sufficiently defined in skopos theory. Its breadth makes it comprehensive and applicable to all translations (ibid, 47-48). Yet it is particularly suited for both commercial (Dunne and Dunne 2011) and technical translations (Olohan 2016), two contexts that make up Festo Didactic's environment.

4.2.1 A Borrowed Term

Vermeer chose the Greek word σκοπός (transliterated "skopos") to mean, simply, purpose, and this is how he and Katharina Reiss used it, without limiting its meaning to the act of

[5] [5] Functionalism is a school of thought whose nucleus is Reiss's and Vermeer's work, and which states that translations are beholden to their prospective *function* or purpose.

translating. Nevertheless, this neologism was chosen to define the concept of purpose in the context of a translation theory while avoiding interference from the daily connotations of words in their language. Naturally, it is well entrenched in the field of TS. I wish to use this word for its evocatory potential, as meaning *purpose*, because the Greek word means "the distant mark looked at, the goal or end one has in view" (2014, 92).

4.2.2 Multiple Skopoi

Businesses are purposeful entities. In analyzing Festo Didactic's marketing materials, and respondents' survey and interview responses, I noticed that the company has various layers of objectives. I also noticed that these objectives organically direct the efforts of the company, including its translation efforts. In the following paragraphs, I describe four layers of objectives, for which I coined names using the term skopos, not to cause confusion but rather to show how these superimposed aims relate to each other and to the concept now known in Translation Studies as translation skopos. Vermeer states that there "may be a number of elements in a set of purposes […], in hierarchical order" (90) and again "that there may be different skopoi and priority hierarchies" (92). I feel these different skopoi with different hierarchies can shed some light on commercial technical translation. Please allow me a theoretical excursion into a realm where everything is skopos.

The highest-level skopos of a company is its mission. I call it *company skopos.* It is the company's ultimate reason for being and defines what it broadly offers to the world: its single overarching value proposition. As mentioned previously, Festo Didactic wants to make "learning ever more efficient" (Festo Didactic 2015, 3).

The second level of skopos is what I call *commercial skopos.* Every company has it regardless of its primary mission. Often termed "the bottom line," I define it as financial

viability, which is the minimum financial goal for any business. Without fulfilling this skopos, the entity would soon cease to exist, rendering it unable to fulfill its first mandate, its *company skopos*. (Of note, some companies may invert the order of these first two. They are entities whose chief concern is to make money and often provide products and services of lower quality. As we have seen in the Results, Festo Didactic puts a greater emphasis on mission.)

The third level of skopos is a company's strategic objectives, which I call *strategic skopoi,* which are high-level decisions made by the company for the best fulfillment of its first- and second-level skopoi.

The fourth level contains two related skopoi: 1) that of its operations (what organizations do to produce goods and services [Heizer and Render 2014, 4]) and 2) the result of these operations. They are intimately tied, but there are differences. *Project skopos* is the aim of its translation operations, and *product skopos*, the aim of the translation product. I speak only of translation operations (as opposed to all of the company's operations) because I wish to focus this discussion solely on translation-related activities and not all the operations of the company. I use the term "project" because in industry (and at Festo Didactic, as mentioned in section 3.4), translation work takes the form of projects (Dunne and Dunne 2011). "Projects can be defined as a series of related tasks directed toward a major output" (Heizer and Render 2014, 60). It is a way of organizing operations and is most useful for work tasks with unique characteristics and a specific goal and deadline (Heizer and Render 2014, 60). I use the word "product" because the translation is a product sold to a customer. At Festo Didactic, each learning solution is customized to a particular technology or a particular client and thus makes up a unique production event with a beginning and an end. It is at this level that the concept of "product

skopos" can be likened to TS's concept of translation skopos, "the intended function of the target text" (Nord 2022, 15).

Here is a summary of the terms I have coined with their definitions for the purpose of my discussion.

Level	Name	Definition
1	*Company skopos*	Company mission and vision
2	*Commercial skopos*	Company's commercial aim
3	*Strategic skopos*	Company's strategic objectives
4 a	*Project skopos*	Aim of the translation project
4 b	*Product skopos*	Aim of the finished translation; Vermeer's translation skopos

Table 14: Business Skopoi

At least in a well-managed company, there is a relation between every level of skopoi. The mission of a company is often repeated internally by management to its employees to align everyone's goals and make sure that every project contributes to the overall mission. Ultimately, *product* and *project skopoi* should only exist if they fulfill *strategic skopoi*. A company should only adopt a *strategic skopos* if it aligns with its *company* or *commercial skopos*. Alexandre Zouncourides-Lull agrees by stating that project expectations ought to be aligned with business objectives and the project justified in relation to those aims (Zouncourides-Lull 2011, 74).

As shown in the next figure, I imagine company skopos as being broader than commercial, strategic, and project skopoi. Each skopos level affects and limits the skopoi below.

Figure 4: Hierarchy of Business Skopoi

4.3 Project Management (PM) Principles

Since commercial translation is often performed as a project, project management principles and methods are valuable in managing commercial translation activities, a fact recognized by Dunne and Dunne (2011, 6). Moreover, there is harmony between several concepts in project management (PM) theory and skopos theory. In their definition of skopos, Dunne and Dunne note that Reiss, Vermeer, and Nord help get a better understanding of project objectives and scope (2011, 6, 7). Moreover, several scholars recognize that project management principles and methods are valuable in managing commercial translation activities (Dunne and Dunne 2011).

The following project management concepts derive from the work by the Project Management Institute and are relevant to our discussion:

Concept	Description	Examples
Constraint	A limiting factor that affects the execution of a project […] or process.	Tight deadlines, cost and time necessary to train the translators in a particular technology, number of translators
Project scope	The work performed to deliver a product, service, or result with the specified features and functions.	600 employee/hours to post-edit, edit, and proofread this series of documents
Product scope	The features and functions that characterize a product, service, or result.	A fully revised and proofread translation into French, Canadian variant, and Spanish, Mexican variant of one textbook and one teacher manual in PDF and paper format with a layout identical to the source text.
Requirement	A condition or capability that is necessary to be present in a product, service, or result to satisfy a business need.	French Canadian variant, and Spanish Mexican variant Publication date: September 30

Table 15: Project Management Concepts (source: Project Management Institute 2021, 235-253)

According to PM theory, defining a translation project scope means describing all the work that needs to be performed. Festo Didactic includes file conversions, pre-translation,

dispatching of translation work, translation proper, review, layout, proofreading, and publishing to achieve the skopos. On the other hand, defining a translation's "product scope" means describing its characteristics, and requirements are *crucial* characteristics. These can include intangible requirements, such as quality descriptors, and tangible requirements, such as start and end dates, file formats, target languages and locales, terminological requirements, components, and volume per component per language/locale combination (Levitina 2011, 99). Interestingly, the etymology of the term "scope" is related to "skopos." The concept of "product scope" is the PM counterpart to the functionalists' skopos.

4.3.1 Project Management Principles Applied

"…the answer is in the problem" Jiddu Krishnamurti

There is an indeterminacy prevalent in TS discourse when defining translation quality. This generalized doubt is due to various reasons. There is a desire by theorists to craft a general theory of translation applicable to all cases. Admittedly, this is what Hans Vermeer sought to do, but he judiciously kept to generalities, for which he was later blamed (Nord 1997). To have an overarching definition of quality means that you specify very little and let circumstances dictate the details. Quality is dependent on many situational variables, such as context, goals of communication, expectations, and educational levels of the communicating parties. When theorists do not allow space to account for them, sometimes by defining them a priori, their theories tend to forbid synergistic collaboration. Each school of thought or subfield within the growing field of translation studies seems to develop at arms' length of each other and of other disciplines (Folaron 2020, 205). There is also limited contact between theorists of different countries and language backgrounds, except maybe when they choose to speak English (Folaron 2020, 205). Finally, there may be too few in-depth exchanges between academia and the world around it (Folaron 2020, 205), namely, industry. Drugan recognizes an academia-industry divide

and attributes it to a lack of opportunities for having meaningful contact and to having different goals (2013, 29-32). Indeed, in practice, industry deals with the topic of translation quality in *determinate* ways. The survey results reported in section 3.3, for instance, showed remarkable agreement on what is believed to characterize a good technical translation. While it is unsurprising that the accuracy of facts and numbers were stated by all as a priority, respondents also generally agreed that clarity and idiomaticity were key in pedagogical technical translation when the meaning of the original was preserved. It appears that participants' intuition guided them to the same approximate conclusion. Of course, the criteria that I had listed in the questions are easy to rate compared to the task of a theorist who would have to precisely define and operationalize the various elements of a good translation. Nevertheless, in my opinion, businesspeople consider translation quality with less hesitation because their obligation to produce quality translations daily and the other pressures of their circumstances make them more practical. That is, their decisions are governed by the constraints inherent in any practice. And this is their advantage. TS discussions on translation quality prescriptions outside this situational specificity cannot satisfactorily lead to a resolution because they deal with a world without limits.

4.3.2 Needs Constrained Become the Product Scope (= Product Skopos)

In reality, a commercial translation project is embarked upon to create a translation product that will satisfy a particular business need (Dunne and Dunne, 2011, 3; Zouncourides-Lull 2011, 74). Yet, this business need is not given full reign. It must first be constrained by realistic limitations before it is formalized as an objective of the translation project. By extension, before determining the product scope, that is, what problems the product should solve and what requirements it must have, project management (PM) leaders look at what is possible

(Project Management Institute 2021; Levitina 2011, 96, 111-112; Zouncourides-Lull 2011, 75). This is because companies in the real world operate with schedules, budgets, particular resources, and risk (Project Management Institute 2008, 6), which have a modulating effect not only on their operations but also on their goals. Being aware of resource limits enables PM leaders to fine-tune their project's objectives. Vermeer hints at these constraining factors when stating that a commission sent to a translator "should comprise as much detailed information as possible on the following (1) the goal, i.e. a specification of the aim of the commission; [and] (2) the conditions under which the intended goal should be attained *(naturally including practical matters such as deadline and fee)*" (Vermeer 2000, 221, emphasis mine). While Vermeer states that the translator is to receive this restrictive information because he is a responsible agent of the work of translation, this information is, at least partly, already imposed on the person giving the commission, the PM leader. A PM leader who realizes that the cost of a translation project would exceed the budget available might choose to use an alternative solution to the need (e.g. automatic translation), adjust the scope of the project (e.g. exclude sections of the document) or abandon the project entirely.

4.3.3 Companies Face Limited Resources

Festo Didactic interviewees mentioned company constraints several times: the importance of producing more translations, producing them better in a shorter time and for less money. The company's systematic use of MT and TM technology in a well-refined translation process indicates this priority. (Although, one would expect a company specializing in automation to make use of these technologies company-wide.) Two out of the three translators surveyed reported being worried about their production speed. Unfortunately, writers were not asked this question because I kept their survey to a minimum, as mentioned in the methodology

section (2.3.4.1). Festo Didactic's objectives were made evident in the study of its processes and in surveying its employees. The bottom line matters, the limitations matter, and its utilitarian aims matter.

4.4 Technical Translation and Users

4.4.1 The Primacy of Usability

Usability, a key criterion for technical documents (Olohan 2016, 51), is defined by the International Organization for Standardization (ISO) as "the extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use" (cited in Olohan 2016, 52). For concision, I say "ease of use" or "highly usable." Technical documents, which are created primarily to assist in the use of some technology, not only need to be highly usable themselves (being products in their own right) but must also help to easily use the system, product or service, because it is their "specified [goal]." Hence, the operative function of an instructional technical document, for example, involves two allied goals. The first is to help users use the technology, and the second—the end goal—is to achieve what the technology was designed for.[6] Thus, usability is defined in relation to a text's ultimate use. Given that technical texts relate to the use of one or more technologies or the application of one or more scientific theories (Olohan 2016, Byrne 2006), I consider usability to be the implicit aim of any technical text.

[6] The goal of, say, a juicer is to squeeze juice out of produce. The goal of the juicer's instructions is to help a user use the juicer (first goal) to juice the produce (end goal). My Hurom juicer is well designed (and is highly usable), but its French instructions are not. A small distinction, perhaps, but one that I think exists. I noticed that when Olohan explains the operative function of technical instructions, she states that "they must enable users to perform a task," (2016, 51) which, in my view, includes two concepts: document use ("enable users") and technology use ("to perform a task"). When she later speaks of *readability* as a separate concept (53), does she mean that the usability of a document is not a function of its readability?

To ensure this usability, a useful set of document creation criteria, the 5 Es, effective, efficient, engaging, error tolerant, and easy to learn, has been suggested by Whitney Quesenbery. ([2001/2000] cited by Byrne 2006, 154 and by Olohan 2016, 52-53). Another set of criteria lists learnability (time required to learn the skill taught [Byrne 2006, 154] or the quality of a text that gives a prolonged capacity [coined by Eiriksdottir [2011] as cited in Olohan 2016, 52]), throughput (ease and efficiency of use after initial learning period), and user satisfaction (Faulkner 1998, cited by Byrne 2006, 154). To ensure usability, Festo Didactic uses various methods that are recommended in the field: mnemonic devices, a glossary, a clear and aesthetic layout, clear and engaging copy, iconic linkage (repeating identical formulations for similar messages [Byrne 2006, 175]), etc. Here are a few participant comments:

- "It must be clear and use standard language, grammar, punctuation, and other writing norms."
- "It must be coherent and must have a logical flow."
- "It must be accessible to all readers/users."
- "Its terminology ought to be easy to understand and uniform throughout."
- "As the readers engage with the text, they must feel they are getting the information they need."
- "they must feel they are acquiring the learning objectives."

The last two comments refer to the students' feelings about achieving their learning objectives. Indeed, Festo Didactic has additional pedagogical responsibilities toward its end users. The ultimate measure of its text's usability is the ease with which students learn and retain the subject matter and acquire technical skills. Pedagogy being culturally determined, this usability measure would need to take into account local pedagogical preferences. (Festo Didactic performs its translations mostly in the country where the product is to be sold. This is certainly an advantage to help naturalize the learning material to local norms.) Pedagogy has a broader aim than usability proper. It involves the additional goals of increasing students' intellectual

abilities and permanent practical skills ("Pedagogy," Britannica Online, n.d.). Nonetheless, technical documents have many overlapping attributes with academic texts. Technical documents deal with academic domains (Folaron 2020 205) and include training and educational materials (Byrne 2006, x). The American National Writers' Union (NWU) names three different types of technical writing: technology education (such as Festo Didactic's teacher/student manuals), traditional technical writing (such as its operating manuals), and technology marketing (such as its brochures). Recommended characteristics of technical texts such as *learnability* and *retention over time* (a similar concept to learnability from the angle of the user and coined by Schneiderman [1998, 15], cited in Byrne 2006, 154) illustrate the affinity between technical and pedagogical texts. In summary, helping learners achieve their learning objectives is a promise Festo Didactic makes to its customers. It constitutes the core of its company and commercial skopoi.

4.4.2 The Importance of Users

While customer satisfaction is a well-established commercial need, the satisfaction of users (in our case, the students), when they are different from the customer, is often forgotten by companies and TS theorists. Yet, as seen above, user satisfaction is listed as one of the three core characteristics of technical writing (Byrne 2006, 154), making it a requirement of the project skopos. Indeed, if usability is the priority, then users are central. Accordingly, even if a paying customer is perfectly satisfied (who is, by virtue of being the paying agent, more readily listened to for his direct impact on the company's *commercial skopos*), a lack of user satisfaction will threaten the *company skopos*, because the company does not fulfill its mission. Eventually, the *commercial skopos* is jeopardized when the customer becomes dissatisfied, maybe because its sales decrease or because the feedback it receives from its own customers (the end users of our

story) is negatively affected. The highest two skopoi of a company are, in this way, inextricably linked to the end users and the *product skopos*. (Interestingly, I found that Festo Didactic does not systematically seek out either customer or end-user feedback, which could be crucial for ensuring skopoi alignment. Nevertheless, Festo Didactic probably validates its processes through its commercial success. This alignment may already be safeguarded given that Festo Didactic has end users in mind throughout its production process: during product and solution design, writing, post-editing, layout, and review. For instance, it follows strict layout, formatting, pedagogical, and uniformization guidelines to increase the pedagogical effectiveness of its textbooks for the students and produces highly innovative software and equipment devised according to usability principles. This is probably the secret of its phenomenal success.)

Since sound business management is dependent on the alignment of the four levels of skopoi, each project skopos should fall within the sphere of the strategic skopoi. The strategic skopoi should fall within the sphere of the commercial skopos, and the commercial skopos, within the company skopos. Anything else represents an organizational or a strategic misalignment and is detrimental to one or more of the skopoi. Indeed, when considering all the efforts deployed to launch a company, devise strategies and create products, in our case translations, if users do not derive the intended utility from these products, this is, arguably, a disaster. To understand the superimposed levels of skopoi and its resulting limitations is to understand more fully the skopos of the translation and the many constraints that it is subject to. These constraints common to every business compel executives, translation teams, post-editors and revisors/reviewers to stay within the boundaries of the four levels of skopoi. Stated differently, these boundaries do much to define translation quality in a corporate setting. When TS scholars talk about translators' tight deadlines, for example, they usually consider it as a

negative factor on quality. I now see them as a defining factor of quality. When dealing with a highly complex problem, such as determining what translation quality is, restrictions are good news.

For Claude Bédard, technical translation is an act of intelligence and communication. In his textbook on the subject, he presents translators as relatively independent from source text authors but as having obligations toward target text readers. Making a text easy to read and adapted to the reader's technical and linguistic knowledge and to text type norms is a priority (1986, 1-3). What he presents are functionalist concepts. Bédard's sentiments are repeated by Maeve Olohan (2016) and Jody Byrne (2006), who use skopos to teach technical translation. Olohan, in her manual on technical translation, also evokes skopos theory when she states that for a technical text to be accepted, it must be created with an understanding of the features of the text genre in the target culture. By giving a detailed chapter-by-chapter description of the norms of several technical text types, she essentially circumscribes translator choices to what is generally acceptable for each. The needs and expectations of the commissioner and the end users of the text are to guide translator decisions. Besides, conventions can best be challenged when they are well known (2016, 4). Byrne, in his manual, not only states that he sees skopos as the most useful theory to examine technical translation (2006, 11) but repeatedly refers to the aim of the translation—usability, clarity, and how well it can be assimilated by the reader— as a guiding principle for technical translators (2006, x, 151, 157, 255).

4.4.3 Terminology for Users

The creation of a reliable glossary is a cornerstone of technical text production, which is replete with concepts outside a normal frame of reference (Bédard 1986, 239). Festo Didactic respondents agreed by stating that this is what makes technical translation different from general

translation. They also emphasized the need to cater to users through terminology choices and explained that they used several methods for this purpose: using the most common synonym, being consistent in the use of terms, and including new terms in glossaries.

Taking into account the expectations of target users is indeed critical (Reiss and Vermeer, 2014, 92), and to ensure that terms are understandable by the users, perhaps the best method would be to consult them directly. I have noticed in my career that terms chosen by engineers and translators are not always suitable for users (Walmer 1999, 232). Microsoft, for instance, found that some countries, namely Brazil, Germany, and Russia, "unanimously preferred [a]nglicisms" (DePalma and Kelly 2011, 392), although these are usually forbidden to translators. Plaxo found that involving users who understand the product or service has improved its translation quality (DePalma and Kelly 2011, 394). Facebook had translation agencies and its enthusiastic communities of users collaboratively translate its site through the implementation of an application development platform. In this work, the company added an unconventional "immediate feedback and correction" step to its conventional translation steps, meaning that it incorporated user feedback into its workflow. The results were outstanding. This project not only had positive results on translation speed and quality, but it enabled Facebook to become a leader in globalization (DePalma and Kelly 2011, 383-386).

Microsoft recognizes that using terminology to mirror local usage is important to satisfy market demands, and consulting with users on the subject is, for them, the key to doing so (DePalma and Kelly 2011, 393). In 2008, Microsoft tested whether, through its crowdsourced translation projects, it is truly able to know if the terms used in its products are those used by knowledgeable Internet communities. Microsoft has made terminology databases and language style guides available to users, and it provides them with a tool to submit feedback on the

terminology used in various language versions of its products. It also created a community forum on the topic, the Microsoft Terminology Community Forum or MTCF, where terms and their translations are uploaded along with their definitions. Experts or consumers comment and discuss translations, suggest alternatives and vote on their favourite translations. Hired terminologists, engineers and marketing experts choose the most popular terms if they are adequate. Translation-user feedback is especially valuable given that users are often conversant with the subject matter and may have a keen awareness of the target language culture and norms in specialized fields (Drugan 2013, 24). Close engagement with users of their products was deemed useful to keep a pulse on the constantly evolving language of the web, whether formal or informal (Desjardins 2019, 389). Not only has the company eased the development of terms for new products in all languages (over 90 languages), but it has also expanded terminology for existing products in less widely supported languages. Maybe most importantly, this program benefits end users by helping improve the company's products and helping it fulfill its mission (DePalma and Kelly 2011, 389).

4.4.4 Safety Risks

Users entail use. Where there is use, there is risk: risk of incidents and accidents. For this reason, technical translation "has to take the audience into account to a more marked extent" (Kingscott 2010, abstract) than other types of translation. Translation success in the technical fields means that instructions are read more accurately, devices, machinery, and vehicles are built better, faster, and more cheaply, and these devices, machines and vehicles can be used more safely.

The very process of translation adds a layer of security risk. Since Drugan states that using pivot languages to translate rare language pairs introduces another layer of potential errors

(2013, 17), we can conclude that she means that translation itself adds a layer of risk, although most survey respondents did not perceive the importance of this risk. Nevertheless, the Festo Didactic team is thorough in their quality control processes, as seen in section 3.4. This is vital because faulty translations may lead to injury, and insufficient regulatory means exist to fix the problem (Drugan 2013, 23). Discussions on the importance of translation quality for safety often increase when mistakes are noted in high-profile cases occurring in highly critical settings (Drugan 2013, 24). Nevertheless, Carmen Canfora and Angelika Ottmann explain that for every high-profile error, there are usually more errors that are not publicized or go undetected, an even greater number of "near-misses" (a risk-management concept that defines incidents with low or no impact but potentially very dangerous), and an even greater number of human or technical errors (2018). The concept of near-misses was adapted to translation risks, which is to add a "powerful instrument to existing strategies for reducing the risks of safety-critical translations" (2018).

Anthony Pym, who has written extensively on translation risk management, believes that the greatest risk of translators may be the loss of trust of clients or receivers (commissioners or end users) (Pym 2017) and communicative failure (Pym and Matsushita 2018, 1). Canfora and Ottmann list reputation loss, safety alerts, financial damage, product withdrawals, lawsuits, and severe and fatal accidents (2018, 22-23). These all can negatively affect the skopoi of the company, and thus are crucial to understand.

Risk-management strategies— risk taking, risk avoidance, such as omitting or generalizing elements of the text, risk transfer, and risk mitigation—might be practiced by translators but may still be viewed as objectionable (Pym and Matsushita 2018, 2; Pym 2017). Responses from the study participants demonstrated that equivalence of content was considered

unnegotiable. I suspect that there would be reticence in accepting these risk-management methods, a reticence probably shared among many technical translators. Nonetheless, these methods are most likely practiced by technical translators when pressed by circumstances. I, for instance, practiced a type of risk mitigation when I would use "Google" to settle on an unknown term when other avenues of terminology research had been exhausted. One surveyed translator mentioned regularly using this method. Of note, Canfora and Ottmann bypass the cognitive strategies of translation risk management mentioned above but focus rather on using near misses to discover systematic errors in translation processes because these are precursors of severe damage (22-23).

Risks of all kinds can have unsuspected deleterious effects on product use, consumer safety, customer satisfaction, company reputation, and sales. The best way to reduce risk in a text is to give correct information and to ensure that it is understood. The best way to ensure the latter is, as we have seen before, to consult users. Unfortunately, end users may not tell a company that the translations produced are bad unless it infringes on their ability to perform a task. Then it might be too late. The Hurom juicer story was one potential example. I have witnessed several others: a badly localized video game that prevents gamers from understanding how to win; an otherwise promising manga story that does not engage its readers due to semantic mistakes in the translation; a translated assembly manual that was laid aside for the original English version by assembly workers who simply needed to finish their task; etc. Slight or serious shifts of meaning may lead consumers to stop using a purchased product (without knowing why). If they were not led to laughter by a subtitled movie, or felt unenchanted by the menu item they ordered, they might leave bad reviews. This unconscious impact of translations will deleteriously affect an organization's mission and commercial aims. Julianne House also emphasizes that any final

judgement of translation quality needs to be based on sample receptors of a translation, on the translation's success in the real world, on how well a translation is in line with the results of relevant market research and on the assessment of selected "judges" (House 2014, 19). Feedback loops between the user and the translation producer should be created. Nevertheless, in gathering feedback, it would be good to remember that users are not always right. They don't always read the operating manuals that could save their lives.

A recent quality assurance metric has been created by harmonizing two industry quality metrics: the Dynamic Quality Framework (DQF) and the Multidimensional Quality Metrics (MQM). It is called the Harmonized error typology developed by TAUS, and it is funded by the European Union's QT21 project ("TAUS - The Language Data Network" n.d.). The metric's aim was for it to apply to industry. Interestingly, the Harmonized error typology classifies texts based on the relative importance of three elements: time, utility (defined as "the relative importance of the functionality of the translated content" or stated simply: usefulness), and sentiment (defined as "the importance of impact on brand image, i.e. how potentially damaging might it be to a translation client if the content is badly translated" ("TAUS - The Language Data Network" n.d.; Lommel et al. 2015, 28). This model contains terms such as "unidiomatic," "inconsistent," and "awkward" as measures of quality. These are target-oriented elements to assess text clarity, text readability, and user satisfaction. As do many other metrics, TAUS's metric also contains severity criteria, which implies "real-life effects" related to the notions of utility and risk. What is different in the harmonized error typology is its more detailed description of various real-life impacts on the user. TAUS's table on severity levels for error categories is reprinted here in its entirety, but the bold emphasis is mine. The whole table refers to translation risk. Green refers to elements of customer or user satisfaction; red, to elements of utility.

#	Definition	Description
1	**Critical**	Errors that may **carry health, safety, legal or financial implications**, **violate geopolitical usage** guidelines, **damage the organization's reputation**, **cause the application to crash** or **negatively modify/misrepresent the functionality of a product or service**, or which could be **seen as offensive**.
2	**Major**	Errors that may **confuse or mislead the user** or **hinder proper use of the product/service** due to significant change in meaning or because errors appear in a visible or important part of the content.
3	**Minor**	Errors that don't lead to loss of meaning and wouldn't confuse or mislead the user but would **be noticed**, would **decrease stylistic quality**, **fluency** or **clarity**, or would **make the content less appealing**.
4	**Neutral**	Used to log additional information, problems or changes to be made that don´t count as errors, e.g. they reflect a reviewer's choice or preferred style, they are repeated errors or instruction/glossary changes not yet implemented, a change to be made that the translator is not aware of.
5	**Kudos**	Used to praise for exceptional achievement.

***Table 16: Impact on Users and Error Categories** (Source: TAUS - The Language Data Network)*

This industry-created assessment tool supports the idea that resource constraints, utility, user satisfaction and risk are essential elements in evaluating translations.

4.5 Statement of Future Directions

While considerable attention and effort have been invested in designing and conducting the research and analyzing the data from this case study, more empirical work is required to validate and enrich findings and conclusions. As mentioned in the methodology section, this study can serve as a trial for future research. Repeating and expanding this same study with four to ten companies (a number recommended in Gagnon 2012, 41) may render the study quantifiable. Multiple-case studies are a more robust vehicle for theory development (Gagnon 2012, 41; Stake 2013) than single-case studies. With a carefully defined broader population and a statistically validated sample, this enquiry could be made into a quantitative study from which

deductions can be made. The variety of data gathered may need to be greatly restricted, however, for, as it happens, considerations of time and effort.

Technical translation, due to its relation to tangible realities, may present new translation assessment pathways that are more concrete. The nature of a translation's impact may be more easily quantifiable. By comparing usage data, it may be possible to survey technical translation users of consumer products (such as juicers) and industrial products (such as machines) on the usability of instruction or assembly manuals. For instance, one could compare the malfunctions of a technical consumer product or an industrial product when used or assembled by those who had original language documentation to those used or assembled by those who had translated language documentation (owner's manuals, assembly manuals, etc.) These malfunctions could be measured by error logs (for industrial products) or by coding customer service calls by the nature of the problem, by measuring student test scores or through simple user feedback. Researchers might also seek to "reverse engineer" actual translations produced by industry—the ones it deemed good—defining these as "quality translations" and studying the steps businesses take to achieve them.

5 Conclusion

Studying Festo Didactic's translation processes in depth has afforded rich qualitative data on how technical translation actually happens in one company. Some fascinating discoveries were made about the individual ideas, feelings, and beliefs of Festo Didactic's translators, writers, and supervisors. Varied findings about the who, what, when and how of two translation workflows and about hiring practices, terminology management, safety issues, etc. were often surprising and always informative.

Since Festo Didactic successfully uses its translations to expand its market reach, we can consider its translations as good. This may not seem like a feat, except when we consider that for a long time in the field of translation studies, there has been no agreed-upon standard to evaluate translations (Drugan 2013; Chesterman and Wagner, 2002; House 2014; Han, 2021; Martínez 2014) nor any common ground in defining quality practically or theoretically (Martinez 2014, 73). On the contrary, there was little hesitation and disagreement on the part of Festo Didactic's respondents when asked to define what is essential in a technical translation.

A fundamental realization resulting from this study is that Festo Didactic's processes have not been created in a vacuum. They are necessarily a product of the company's many aims, which, according to my model of multiple skopoi, exist in hierarchical layers and govern the company's decisions and operations, namely the production of translations. Also, business activities cannot escape the inherent restrictions of scarce resources. Thus, business motives and the common sense management of these resources funnel decisions on translation in one direction or another. The *applied* nature of the technical subjects in technical translation further confines translation decisions. Since application involves "use," users, usability, clear terminology, and safety become core factors in determining what a translation should achieve. Indeed, rather than being a hindrance to achieving quality, business and life constraints of all kinds should help clarify how to hit the mark.

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Appendices

Appendix A – Ethics Compliance Certificate

CERTIFICATION OF ETHICAL ACCEPTABILITY
FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant:	Claudine Pierre-Antoine Belhomme
Department:	Faculty of Arts and Science\Études françaises
Agency:	N/A
Title of Project:	Technical Translation and Translation Processes in a Multilingual, Multinational Context: A Focus on Festo Didactic
Certification Number:	30014985

Valid From: May 20, 2021 To: May 19, 2022

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.

Richard DeMont

Dr. Richard DeMont, Chair, University Human Research Ethics Committee

Appendix B – Company Recruitment Letter

January 17, 2018

Company
Address

Subject: Research Proposal

Dear Madam, dear Sir:

I am a graduate student of Translation Studies at Concordia University, and I work under the supervision of Dr. Deborah Folaron.

I am conducting research to find out if using translated assembly manuals (as opposed to assembly manuals written in the original language) can be correlated with an increase in equipment malfunctions.

Would you allow me, under the most stringent privacy constraints, to consult your company data related to this question? I will gladly submit to and sign a confidentiality agreement and provide you with the results of my research.

Greater detail regarding the methodology, timeline, and research objectives are found below my signature. I remain available for your questions, whether by email or through a short telephone call to discuss your questions.

I thank you for favourably considering my proposal and I eagerly await your reply.

Respectfully,

Claudine Belhomme
Graduate Studies
Concordia University
claudine.belhomme@hotmail.com

(Appendix B continued)

Research Proposal

Studying the Relationship between Translated Assembly Manuals and Equipment Malfunctions

Claudine Belhomme, student number 24206169
Concordia University, Department of French Studies
For the degree of Master in Translation Studies
Under the supervision of Dr. Deborah Folaron
September 2018

Research Question

Is there a correlation between whether or not a device's assembly manual is translated and the number of malfunctions of that device?

Hypothesis

Device malfunctions increase in number when the device is assembled with a translated manual.

Research Objectives

1) Answer the research question.
2) Test the research hypothesis.
3) Formulate hypotheses regarding how and to what degree translation constitutes a risk for the translation client in a safety-critical sector.
4) Gather information to start drafting a theoretical framework for defining an alternate, objective, and non-textual translation quality measure.

Methodology

- Find one device or preferably more devices:
  - Whose assembly was performed with assembly manuals in the original written language ("OA Device").
  - And preferably whose assembly was also performed with translated assembly manuals (otherwise, find other devices whose assembly was performed with translated assembly manuals) ("TA Device").
  - For which the number of malfunctions is recorded.
- Fetch and examine the data and compare malfunction rates of both OA Devices and TA Devices (possibly from your manufacturing operations in different countries).
- Possibly perform qualitative interviews with
  - assembly/repair technicians
  - quality assurance specialists
  - translators

Scheduled Timeline

April 15, 2019 to May 30, 2019

Appendix C – Corporate and Sample Participant Consent Forms

INFORMATION AND CONSENT FORM (Corporate)

Study Title: Technical Translation and Translation Processes in a Multilingual, Multinational Context: A Focus on Festo Didactic

Researcher: Claudine (Pierre-Antoine) Belhomme
Master's Student in Translation Studies

Contact Information: Département d'Études françaises
Concordia University
1455 De Maisonneuve Blvd. W.
Montreal, Quebec, H3G 1M8
(902) 580-5885
claudine.belhomme@hotmail.com

Faculty Supervisor: **Dr. Debbie Folaron**
Associate Professor
Département d'Études françaises

Contact Information: **Concordia University**
1455 De Maisonneuve Blvd. W.
Montreal, Quebec, H3G 1M8
S-LB 607-9
(514) 848-2424 ext. 7516
debbie.folaron@concordia.ca

Festo Didactic has been invited to participate in the research study mentioned above. This form provides information about what participating would mean. Please read it carefully before agreeing to participate or not. If Festo Didactic representatives require additional information, please contact the researcher by email at claudine.belhomme@hotmail.com or by phone at 902 580-5885.

A. PURPOSE

The purpose of the research is to describe Festo Didactic's translation processes thoroughly. In other words, the researcher is looking to find out how Festo Didactic translates its technical

documentation and other content. Thus, the research is designed to answer a number of related research questions, such as, "What are Festo Didactic's translation procedures? What measures are in place to *ensure* translation quality? What measures are in place to *evaluate* quality? Is the process different when translating technical texts as opposed to translating texts of a more general nature? Does Festo Didactic have translation guidelines? What are Festo Didactic's employees' ideas about translation? How do these ideas guide translation work in the company?"

B. PROCEDURES

If Festo Didactic opts to participate, the researcher will use the following methods to investigate Festo Didactic's translation process and procedures at the head office, and at other designated offices. (Please note that a Festo Didactic representative will work with the researcher to determine who the participants will be.)

- Analysis of electronic or paper documentation:
    - previous process descriptions
    - policies and procedures
    - code of ethics
    - copyrights
    - regulatory documentation
    - other documentation
- Three questionnaires (translators, writers, supervisors)
- Semi-structured recorded videoconference interviews (supervisors)
- Ad hoc communications (email, recorded videoconferencing, telephone) (supervisors, translators, writers)
- In-person observations to understand details about the various translation tasks, as well as what software and hardware are used, behaviors, and about unwritten translation requirements and policies (one translator)

In total, questionnaire participants in this study will need up to 90 minutes to answer the questionnaires. Interview participants will need up to 180 minutes for the interview. Work observations will not exceed one day of work.

C. RISKS AND BENEFITS

This research is not intended to benefit Festo Didactic. However, the results of this research may be beneficial to the company.

There is a risk that any information published could be used by the company's competitors to their advantage. However, there are no significant risks to individual participants.

D. CONFIDENTIALITY

We will gather the following information as part of this research:
Information about Festo's translation policies, guidelines, processes, procedures
Information about the effectiveness of current translation policies, guidelines, processes, procedures
Information about employees' prevailing ideas about translation
Information regarding Festo Didactic's employees' or stakeholders' age group, their training, and their experience

We will not allow anyone to access the information, except people directly involved in conducting the research, i.e. researcher, supervisor. We will use the information solely for the purposes of the research described in this form.

The questionnaire respondents will be anonymous. The information gathered during the interviews/ observations and ad hoc communications will be confidential. This means that the researcher will know the identity of the participants, but their identity will not be disclosed. Festo Didactic will be identified in the published results.

The information will be safely stored in encrypted files on a secure laptop and backed up in encrypted folders on the cloud. Paper documents, if any, will be stored in a locked cabinet. On September 30, 2021, or at the conclusion of the study (whichever comes first), all identifiable participant data will be destroyed, and confidential company documents will be returned to Festo Didactic, shredded or erased by the researcher.
The results of the research will be published as a thesis and uploaded to Concordia University's repository and will be available to the university community and to the public if requested. This research may also be published in an abridged form in a translation studies journal (e.g. Translation Spaces https://benjamins.com/catalog/ts and TTR https://www.erudit.org/en/journals/ttr/).

F. CONDITIONS OF PARTICIPATION

Festo Didactic is not obliged to participate in this research. It is purely the company's decision. If it does participate, this participation can be stopped at any time.

Festo Didactic and individual participants may ask that the information they have provided not be used, and this choice will be respected. Should the company or individual participants decide that they do not wish us to use their information, they must notify the researcher by email at claudine.belhomme@hotmail.com before September 21, 2021.

There are no negative consequences for not participating, stopping in the middle, or asking us not to use the information previously provided. Similarly, individual participants (employees, stakeholders, etc.) should be allowed to participate in this study willingly, without constraint.

Moreover, no repercussions are expected for the participants based on their answers.

G. PARTICIPANT'S DECLARATION

As a duly authorized representative of Festo Didactic, I have read and understood this form. I have had the chance to ask questions, and my questions have been answered to my satisfaction. I freely give my consent to authorize the aforementioned research under the conditions described. Festo Didactic has been supplied with a copy of this form for reference purposes.

NAME OF AUTHORIZED FESTO DIDACTIC REPRESENTATIVE (please print)

_____

TITLE OF AUTHORIZED FESTO DIDACTIC REPRESENTATIVE (please print)

_____

SIGNATURE

_____

DATE

_____

If you have questions about the scientific or scholarly aspects of this research, please contact the researcher. Their contact information is on page 1. You may also contact their faculty supervisor.

Should you have any concerns about ethical issues regarding this research, please contact the Manager, Research Ethics, Concordia University, 514.848.2424 ex. 7481 or oor.ethics@concordia.ca.

INFORMATION AND CONSENT FORM (Group A)

Study Title: Technical Translation and Translation Processes in a Multilingual, Multinational **Context**: A Focus on Festo Didactic

Researcher: Claudine (Pierre-Antoine) Belhomme
Master's Student in Translation Studies

Contact Information: Département d'Études françaises
Concordia University
1455 De Maisonneuve Blvd. W.
Montreal, Quebec, H3G 1M8
(902) 580-5885
claudine.belhomme@hotmail.com

Faculty Supervisor: Dr. Debbie Folaron
Associate Professor
Département d'Études françaises

Contact Information: Concordia University
1455 De Maisonneuve Blvd. W.
Montreal, Quebec, H3G 1M8
S-LB 607-9
(514) 848-2424 ext. 7516
debbie.folaron@concordia.ca

You are being invited to participate in the research study mentioned above. This form provides information about what participating would mean. Please read it carefully before deciding if you should wish to participate or not. If there is anything you do not understand, or if you would like more information, please contact the researcher by email at claudine.belhomme@hotmail.com or by phone at 902 580-5885.

A. PURPOSE

The purpose of the research is to describe Festo Didactic's translation processes thoroughly. In other words, we are looking to find out how Festo Didactic translates its technical documentation and other content. Thus, we are interested in answering a number of related research questions, such as, "What are Festo Didactic's translation procedures? What measures are in place to *ensure* translation quality? What measures are in place to *evaluate* quality? Is the process different when translating technical texts as opposed to translating texts of a more general nature? Does Festo Didactic have translation guidelines? What are Festo Didactic's ideas about translation? What are yours? How do these ideas guide you in your translation-related work and how does it guide the general translation process of the company?" Since all findings will be communicated to Festo Didactic, this study will provide Festo Didactic with a comprehensive picture of its own translation processes.

B. PROCEDURES

If you participate, you will be asked to answer a questionnaire. In total, participating in this study will take up to 90 minutes.

C. RISKS AND BENEFITS

This research is not intended to benefit you personally, and there are no risks to participants.

D. CONFIDENTIALITY

We will gather the following information as part of this research:

- Information about Festo's translation policies, guidelines, processes, procedures
- Information about the effectiveness of current translation policies, guidelines, processes, procedures
- Information about your ideas regarding translation
- Information about your age group, your training, and your experience

Your participation will be entirely anonymous. This means that your answers will not be linked to your identity. Your answer identifying your role at Festo Didactic will not be linked to the rest of your answers, except in an aggregate (and anonymous) form. Only Festo Didactic will be identified in the study.

We will not allow anyone to access the information, except people directly involved in conducting the research, i.e. researcher, supervisor. We will use the information solely for the purposes of the research described in this form.

We will protect the information by safely storing all data in encrypted files on a secure laptop and backing it up in encrypted folders on the cloud. Paper documents, if any, will be stored in a locked cabinet. On September 30, 2021, or at the conclusion of the study (whichever comes first), all identifiable participant data will be destroyed.

The results of the research will be published as a thesis and uploaded to Concordia University's repository and will be available to the university community and to the public if requested. This research may also be published in an abridged form in a translation studies journal (e.g. Translation Spaces https://benjamins.com/catalog/ts and TTR https://www.erudit.org/en/journals/ttr/).

F. CONDITIONS OF PARTICIPATION

You are not obliged to participate in this research. It is purely your decision. If you do participate, you may stop at any time. You may also ask that the information you provided not be used, and your choice will be respected. Should you decide you do not wish us to use your information, you must notify the researcher by email at claudine.belhomme@hotmail.com by September 21, 2021.

There are no negative consequences for not participating, stopping in the middle, or asking us not to use your information.

G. PARTICIPANT'S DECLARATION

I have read and understood this form. I have had the chance to ask questions, and my questions have been answered to my satisfaction. I agree to participate in this research under the conditions described.

NAME (please print)

_____

SIGNATURE

_____

DATE

_____

Thank you for your consent to participate in this study.

If you have questions about the scientific or scholarly aspects of this research, please contact the researcher. Their contact information is on page 1.

You may also contact their faculty supervisor. Should you have any concerns about ethical issues in this research, please contact the Manager, Research Ethics, Concordia University, 514.848.2424 ex. 7481 or oor.ethics@concordia.ca.

Appendix D – Process Worksheet

Charting Festo Didactic's Translation Processes

Office:_____ Name of Festo Didactic Representative: _____ Date: 2021/ _____ /_____

Translation process functions	Who? Please list official job titles if the task is done in-house. If it is subcontracted, please state so.	What software? What file formats?	When?	How?	Festo Didactic Respondent
Manages the writing project (manages scope, timelines, human resources, budgets)					
Manages the translation project (manages scope, timelines, human resources, budgets)					
Writes the content (specify type of content:)					
Writes the content (specify type of content:)					
Writes the content (specify type of content:)					
Writes the content (specify type of content:)					
Prepares the layout for print				% of total output?	
Prepares the layout for Web				% of total output?	
Ensures the content and layout are internationalized (consult glossary on next page)					
Receives the translation request					
Launches the translation project					
Prepares the content for translation (ex: converts the files to the translation format, including images, tables, markings, application interfaces, etc.)					
Pre-translates content (using Translation Memory) (specify type of content:)					

Charting Festo Didactic's Translation Processes

Office:_____ Name of Festo Didactic Representative: _____ Date: 2021/ _____ /_____

Pre-translates content (using Translation Memory) (specify type of content:)					
Pre-translates content (using Translation Memory) (specify type of content:)					
Pre-translates content (using Machine Translation) (specify type of content:)					
Pre-translates content (using Machine Translation) (specify type of content:)					
Pre-translates content (using Machine Translation) (specify type of content:)					
Translates the equipment markings					
Translates the document images, tables, and graphs					
Translates the application interfaces					
Translates the text files					
Translates or post-edits					
Revises the translated content in parallel with the original content (bilingual revision)					
Reviews the translated content as a standalone text (unilingual review)					
Converts the files to the reading format					
Finalizes the layout					
Proofreads the content and the layout					
Assesses the translation quality					
Assesses the quality of the final product					
Hires translators/ revisers/proofreaders					

Charting Festo Didactic's Translation Processes

Office:_____ Name of Festo Didactic Representative: _____ Date: 2021/ _____ /_____

Assesses translators/revisers/proofreaders					
Manages the translation memory software pre-process (configures and links language resources to the software, such as termbases, multilingual aligned texts, translation memories (TM), QA functionalities)					
Manages the translation memory software post-process (makes modifications based on feedback and revision/review: adjusting QA configurations, TM settings)					
Manages the translation memories pre-process (creates, manages)					
Manages the translation memories post-process (makes modifications based on feedback and revision/review: revises, corrects, streamlines)					
Manages the terminology pre-process (creates, manages terminology databases, manages the terminology software)					
Manages the terminology during the process and post-process (performs research, and corrects, and streamlines the database)					
Contributes to the terminology (researches terms, adds terms)			At any time		
Approves terminology entries entered by other contributors					
Manages the digital multilingual resources (adds, sets up resources, organizes training)					
Manages the paper multilingual resources					
Oversees controlled authoring					
Creates, modifies the style guide					
Manages multilingual content with unilingual or multilingual CMS					

Charting Festo Didactic's Translation Processes

Office:_____ Name of Festo Didactic Representative: _____ Date: 2021/ _____ /_____

Creates and builds dictionaries					
Determines translation procedures for solely human translation processes.					
Determines translation procedures for solely automated/machine translation processes.					
Determines translation procedures for a mix of human and automated/machine translation processes.					
Learns about all software related to translation					
Prepares training for all software related to translation					
Prepares terminology research training					

Glossary

Internationalization : creating content and layouts that are ready for translation in any language or modifying content and layout in order to make them ready for translation. Examples of an internationalized text are the use of controlled language, and character encoding to manage different languages and their scripts, ex. Unicode, leaving 30% more blank space in order to give space to lengthier languages and thus avoid extra formatting work and ensure a similar pagination of both the source and target documents. avoid country-specific references; avoid forced line/page breaks.

Pre-translation work : localize product markings, and software interfaces before translating related manuals; using original, editable source files with only live text in graphics, charts, tables, and other images.

Appendix E – Interview Questions

Interview Questions

Date: 2021 / _____ / _____

Question	Response
How many different translation processes exist at Festo Didactic? For example: Client learning solutions Learning products Product/solutions marketing (brochures, website, etc.) Assembly/maintenance manuals Corporate documentation (financial statements)	
How many different types of contents do you produce? Examples: translations revisions equipment markings website videos	
Describe your (Client Learning Solutions) translation process	
How is your process for Assembly Maintenance Manuals different?	
Do your revisers/reviewers do spot checks or do they read each line carefully?	
How is your process for Corporate documentation (i.e. published financial statements) different?	
Do you build and leverage banks of text? If so, what are your procedures for doing so?	
What are your procedures for building and leveraging TMs?	
What are your procedures for building terminology databases?	
Are one or more members of the DTP team able to read in the target language? Is that person responsible for proofreading?	
What translation quality assurance processes do you have in place?	
Is your translation quality assessment evaluation different when outsourcing translation? Is this evaluation different when using Machine Translation?	

In your country, what are the regulatory requirements regarding terminology?	
In your opinion, to what extent does translation constitute a risk for clients in a safety-critical sector?	
Has translation resulted in any impact on equipment malfunctions, test scores, or the number of customer service complaints?	
How does Festo Didactic prepare texts for translation in order to reduce translation costs? Examples include: controlled authoring, character encoding, avoiding country-specific references; leaving 30% extra space for translated text; avoiding forced line/page breaks; localizing software and product markings before translating related manuals; using original, editable source files with only live text in graphs and images?	
How does Festo Didactic prefer paying its translation subcontractors: per page, per word or per hour? Or is there a different payment scheme? Does the payment structure change when CAT and MT technologies are used? What is the most advantageous for different processes and different document types?	
How many times are the files converted in the translation process? How many pieces of software are used? Can we reduce that number and skip a few steps?	
Do you consider different levels of quality acceptable for different types of texts at Festo Didactic? If so, what are they, how do you identify them, and for which function are they used?	
How do you manage the translation versions in relation to the document versions?	
How do you manage the different language versions in relation to one another?	
When and/or how often do you translate information in your Product Information Management system?	
When and/or how often do you update information in your Product Information Management system?	
Is the translation work done directly in your cloud-based Content Management System (CMS)?	

And if so, how is user access to the CMS managed? Is the translator authorized with all or some rights?	
What is your process for translating images in manuals?	
What is your process for localizing product markings?	
What is your process for localizing software?	
What guidelines do you provide your content creation team (writers, editors) and/or your translation team (translators, reviewers, revisers, proofreaders, layout) to ensure a better usability of your documents by end users (teachers, students)?	
Do you perform usability testing of the original content? What form does this testing take? On what basis? When is it done?	
Do you perform usability testing of the translated content? What form does this testing take? On what basis? When is it done?	
What would you like to see improve in the current translation process?	
What would you like to see remain unchanged in the current translation process?	
What would the ideal translation process look like to you?	
To which of the following standards do you adhere? ISO 17100: Translation Services – Requirements for Translation Services ISO/TS 11669 Translation Projects – General Guidance ISO 9001/9004: Quality Management EN 15038: Translation Services: Service Requirements ASTM F2575-14: Standard Guide for Quality Assurance in Translation	

Appendix F – Translator, Writer, and Supervisor Surveys

FESTO DIDACTIC SUPERVISOR SURVEY

Thank you for agreeing to answer this survey.
Kindly answer each question according to your experience at Festo Didactic.

Question 1

How useful would you find each kind of training for **your translation team**? (Check one box per row.)

Training Topic	**Very** useful	**Fairly** useful	**Not very** useful	**N/A**
SOFTWARE TRAINING				
Across advanced functions	☐	☐	☐	☐
AutoCAD Inventor advanced functions	☐	☐	☐	☐
Cosima or other CMS advanced functions	☐	☐	☐	☐
Machine translation post-editing	☐	☐	☐	☐
Product Information Management advanced functions	☐	☐	☐	☐
Quality assurance software advanced functions	☐	☐	☐	☐
Terminology software advanced functions	☐	☐	☐	☐
Other software:_____	☐	☐	☐	☐
USABILITY TRAINING				
Accessibility (techniques for adapting written documents to support people with disabilities)	☐	☐	☐	☐
Didactic methods (techniques for improving readers' understanding and retention)	☐	☐	☐	☐
Usability techniques (techniques for increasing a document's ease of use and readers' effectiveness and satisfaction)	☐	☐	☐	☐
LANGUAGE TRAINING				
Source language (improving vocabulary, grammar & style)	☐	☐	☐	☐
Target language (improving vocabulary, grammar & style)	☐	☐	☐	☐
Revision/proofreading methods	☐	☐	☐	☐
Terminology research	☐	☐	☐	☐
Translation methods and strategies	☐	☐	☐	☐
OTHER TRAINING				
Project management	☐	☐	☐	☐
Technical/scientific subjects	☐	☐	☐	☐
Other:_____	☐	☐	☐	☐
Other:_____	☐	☐	☐	☐

Question 2

What **training** does Festo Didactic offer its team of **writers** and **translators**? (Check all that apply.)

Training Topic	Offered to **writers**	Offered to **translators**
SOFTWARE TRAINING		
Across advanced functions	☐	☐
AutoCAD Inventor advanced functions	☐	☐
Cosima or other CMS advanced functions	☐	☐
Machine translation post-editing	☐	☐
Product Information Management advanced functions	☐	☐
Quality assurance software advanced functions	☐	☐
Terminology software advanced functions	☐	☐
Other software:_____	☐	☐
USABILITY TRAINING		
Accessibility (techniques for adapting written documents to support people with disabilities)	☐	☐
Didactic methods (techniques for improving readers' understanding and retention)	☐	☐
Usability techniques (techniques for increasing a document's ease of use and readers' effectiveness and satisfaction)	☐	☐
LANGUAGE TRAINING		
Source language (improving vocabulary, grammar & style)	☐	☐
Target language (improving vocabulary, grammar & style)	☐	☐
Revision/proofreading methods	☐	☐
Terminology research	☐	☐
Translation methods and strategies	☐	☐
OTHER TRAINING		
Project management	☐	☐
Technical/scientific subjects	☐	☐
Other:_____	☐	☐
Other:_____	☐	☐

Question 3

What characteristics should a **good technical translation** have? (Please be as detailed as possible.)

Question 4

How is **technical translation different** in practice **from general translation** at Festo Didactic?

Question 5

Technical language tends to be more precise and consistent than everyday language. Some technical terms may be unknown to the reader, who might refer to the same concepts using different words.

This difference may be a source of misunderstanding. What methods can a writer or translator use to increase the likelihood of using the same terms as his readers would use (such as instructors and students)?

Question 6

Have users ever given feedback about the clarity of the **original language** content? (Check one.)

☐ No

☐ Yes. Please state the nature of that feedback:

☐ I do not know.

Question 7

Have users ever given feedback on the clarity of the **translated** content? (Check one.)

☐ No

☐ Yes. Please state the nature of that feedback:

☐ I do not know.

Question 8

Has there been a difference in user feedback for original language content compared to translated content?

☐ No

☐ Yes. Please explain:

☐ I do not know.

Question 9

Was there ever a time when you wondered whether a client's difficulties with a piece of equipment or with a teacher or student manual were in part due to an unclear sentence in a translated text?

☐ No

☐ Yes. Please explain:

Question 10

Considering sources of risks to physical safety, how much do you agree that translated texts add an additional layer of safety risks? (Check one.)

Mostly agree	Agree	Neither agree nor disagree	Disagree	Mostly disagree
☐	☐	☐	☐	☐

Please explain your answer:

Question 11

Does Festo Didactic **assess** the safety risks of translated texts?

☐ No

☐ Yes. Please state how Festo Didactic assesses the safety risks of translated texts:

Question 12

In general, in what situations would you hire an external translation partner to complete a translation project rather than completing it in-house? (Check all that apply.)

☐ To free up resources for higher priority projects

☐ When there are too few employees to complete the project

☐ When there is a lack of subject matter knowledge internally

☐ When there is insufficient time to complete the project

☐ When the project is too complex

☐ Other, specify:

Question 13

What kind of external translation partner would your department choose? (Check all that apply.)

☐ Translation company. Please specify why:

☐ Translation agency (“broker.”) Please specify why:

☐ Freelance translator. Please specify why:

☐ Other, please specify the kind of translation partner and specify why:

☐ No preference

Question 14

What type of external translation partner did you **last hire**? (Check one.)

☐ Translation company

☐ Translation agency (“broker”)

☐ Freelance translator

☐ Other, specify:_____

Question 15

What criteria led you to choose the **last hired** external translation partner among its competitors? (Check all that apply.)

☐ Certifications (ex: ISO, EN)

☐ Claimed subject-matter competence

☐ Demonstrated subject matter competence

☐ Past performance working with Festo Didactic

☐ Preliminary evaluation of translation before hiring

☐ Price

☐ A personal or professional referral

☐ Website testimonials

☐ Word-of-mouth

☐ Other, specify:_____

Question 16

How would you rate the **last hired** external translation partner's performance?

	Did not meet expectations	Met expectations	Went above expectations
Cost	☐	☐	☐
Creation of a terminology bank, or style guide	☐	☐	☐
Knowledge of subject matter	☐	☐	☐
Use of proper terminology	☐	☐	☐
Respect of Festo Didactic's style guide and other guidelines	☐	☐	☐
Speed	☐	☐	☐
Writing style aesthetics	☐	☐	☐
Timeliness	☐	☐	☐
Translation accuracy	☐	☐	☐
Overall result	☐	☐	☐

Question 17

When hiring team members listed in the table below, do you prefer a candidate with strong **linguistic knowledge** or strong **scientific/technical knowledge**? (While a perfect mix of both may be ideal, which one would you prefer if one were necessarily stronger? And to what degree?)

	Excellent Linguistic Knowledge + **Basic** Technical Knowledge	**Good** Linguistic Knowledge + **Average** Technical Knowledge	**Average** Linguistic Knowledge + **Good** Technical Knowledge	**Basic** Linguistic Knowledge + **Excellent** Technical Knowledge
Machine translation assistant (performs clerical work)				
Machine translation post-editor (corrects the DeepL translation)				
Proofreader (checks the final layout and typography)				
Technical writer				
Terminologist				
Translation project manager				
Translator				
Reviewer (unilingual revision)				
Reviser (bilingual revision)				
Other:				

Question 18

What guidelines must your team of translators follow to perform their work? (Check all that apply.)

☐ Accessibility guidelines
☐ Didactic guidelines
☐ Festo style guides
☐ Naming conventions
☐ Procedural guidelines
☐ Terminology guidelines
☐ Usability guidelines
☐ Other, please specify:_____

Question 19

How would you rate the **quality level of the current translation memories**? (Check one.)

Very good	Good	Satisfactory	Unsatisfactory	I do not know
☐	☐	☐	☐	☐

Question 20

How would you rate the **quality level of the current terminology databases**? (Check one.)

Very good	Good	Satisfactory	Unsatisfactory	I do not know/ N/A
☐	☐	☐	☐	☐

Question 21

Who has access to your team's **terminology data**? (Check all that apply.)

☐ Other Festo Didactic offices
☐ Festo
☐ External translation partners
☐ Others, please specify all:

Question 22

Who has access to your team's **translation memories**? (Check all that apply.)

☐ Other Festo Didactic offices
☐ Festo
☐ External translation partners
☐ Others, please specify all:

Question 23

Who gives your team access to their **terminology data**? (Check all that apply.)

☐ Other Festo Didactic offices

☐ Festo

☐ External translation partners

☐ Others, please specify all:

Question 24

Who gives your team access to their **translation memories**? (Check all that apply.)

☐ Other Festo Didactic offices

☐ External translation partners

☐ Festo

☐ Others, please specify all:

Question 25

When a translation is modified in the revision or proofreading stages, is the **translation memory** systematically updated?

☐ Yes

☐ No

Question 26

What translation **quality assurance** procedures are currently in place?

Question 27

How often does your team do the following? (Check one box per row.)

	Daily	Several times per week	Several times per month	Less than once a month	Never
Start a new translation project	☐	☐	☐	☐	☐
Clean up terminology databases	☐	☐	☐	☐	☐
Clean up translation memories	☐	☐	☐	☐	☐
Attend training	☐	☐	☐	☐	☐
Meet together to discuss how to make course corrections	☐	☐	☐	☐	☐

Question 28

How often do you **worry** about the following?

	Never	Rarely	Sometimes	Often	Always
Is the level of quality in this translation the best that we can produce?	☐	☐	☐	☐	☐
Will the quality of this translation satisfy the client?	☐	☐	☐	☐	☐
Will the quality of this translation negatively affect Festo Didactic's reputation or sales?	☐	☐	☐	☐	☐
Will the users of this translation (ex.: instructors, assembly technicians, students) notice that it is a translation?	☐	☐	☐	☐	☐
Will the users of this translation understand the terminology used?	☐	☐	☐	☐	☐
Are we taking too long to translate?	☐	☐	☐	☐	☐
Are we using too many resources to translate?	☐	☐	☐	☐	☐
Are we using too few resources to translate?	☐	☐	☐	☐	☐
How can we improve translation quality?	☐	☐	☐	☐	☐
How can we speed up translation?	☐	☐	☐	☐	☐
Are we using translation best practices?	☐	☐	☐	☐	☐
Are we paying too much for this translation?	☐	☐	☐	☐	☐
How good is this translation?	☐	☐	☐	☐	☐

Question 29

How important do you consider each element in a **technical translation**? (Check one for each row.)

	Very important	Of average importance	Not very important	I do not know.
Accurate numbers	☐	☐	☐	☐
Accurate terminology	☐	☐	☐	☐
Appears as if it is not a translation	☐	☐	☐	☐
Clear (easy to understand)	☐	☐	☐	☐
Faithful to the original	☐	☐	☐	☐

Literal translation	☐	☐	☐	☐
Same effect on the reader as the original	☐	☐	☐	☐
True to the message	☐	☐	☐	☐
Word-for-word equivalence	☐	☐	☐	☐
Other:_____	☐	☐	☐	☐
Other:_____	☐	☐	☐	☐

Question 30

How, and at what point in the cycle, is the quality of a translation evaluated?

Question 31

In what situations are translations **evaluated** for quality? (Check all that apply.)

☐ Every translation

☐ Ad hoc

☐ At regular intervals

☐ When an external translation partner performs a translation

☐ When a reviewer/reviser notices errors

☐ When there is a client complaint

☐ When a translation is post-edited after a DeepL-generated translation

☐ When a translation is not the result of a DeepL-generated translation

☐ Other, please specify:

Question 32

What metrics do you use to evaluate or improve translation quality? (Check all that apply.)

☐ LISA QA metric

☐ SAE J2450 metric

☐ TAUS Dynamic Quality Framework (DQF) metric

☐ Multidimensional Quality Metric (MQM)

☐ MQM-DQF harmonized metric

☐ Others, please specify: _____

☐ None. We evaluate translations without the use of metrics.

Question 33

When you finish a translation project, do you, as a company, systematically seek out feedback?

☐ Yes
☐ No (If no, **please skip to question 36**.)

Question 34

If yes, from whom do you seek feedback? (Check all that apply.)

- ☐ Clients
- ☐ End users
- ☐ Sales offices
- ☐ Translators/translation agencies
- ☐ DTP specialists
- ☐ Reviewers
- ☐ Terminologists
- ☐ Writers
- ☐ Others, specify:_____

Question 35

And how do you seek out feedback? (Check all that apply.)

- ☐ Email
- ☐ Survey
- ☐ Telephone call
- ☐ Other, specify:_____

Question 36

When you finish a translation project, do you systematically give feedback (positive or negative)?

- ☐ Yes.
- ☐ No. (If no, **please skip to question 39**.)

Question 37

If yes, to whom do you give feedback? (Check all that apply.)

- ☐ Clients
- ☐ Clients
- ☐ End users
- ☐ Sales offices
- ☐ Translators/translation agencies
- ☐ DTP specialists
- ☐ Reviewers
- ☐ Terminologists
- ☐ Writers
- ☐ Others, specify:_____

Question 38

And how do you give feedback? (Check all that apply.)

- ☐ Email
- ☐ Telephone call
- ☐ Other, specify:_____

Question 39

In the spirit of continuous improvement, at which one of the three priority levels should the following aspects of translation quality be the object of improvement efforts at Festo Didactic?

	First priority	**Second** priority	**Third** priority	**N/A**
TEXT IMPROVEMENTS				
Accessibility of content (for people with disabilities)	☐	☐	☐	☐
Accuracy (precise facts and numbers)	☐	☐	☐	☐
Clarity (easy to understand)	☐	☐	☐	☐
Correctness of the terminology	☐	☐	☐	☐
Faithfulness to the original	☐	☐	☐	☐
Grammar, syntax	☐	☐	☐	☐
Naturalness (reads like an original text, idiomatic)	☐	☐	☐	☐
Respect of country-specific writing conventions	☐	☐	☐	☐
Usability (easy to use)	☐	☐	☐	☐
Word choice	☐	☐	☐	☐
PROCESS IMPROVEMENTS				
Easier access to reference material	☐	☐	☐	☐
More team communication during projects	☐	☐	☐	☐
More relevant training	☐	☐	☐	☐
Better quality assurance procedures	☐	☐	☐	☐
Better use of QA features in Across or COSIMA	☐	☐	☐	☐
Streamlining the translation process	☐	☐	☐	☐
Other, specify: _____	☐	☐	☐	☐

Question 40

If there were no limits on company resources, what would you suggest doing to **improve translation quality**?

…to **shorten translation time**?

…to **reduce translation costs** (other than what you answered in the previous question)?

Question 41

Do you have any additional suggestions to improve the overall performance of Festo Didactic?

Question 42

What would you like to see remain unchanged in how your team works? (Be as specific as possible.)

Question 43

Let us suppose that each row of boxes represents a continuous spectrum between two views on translation quality. Place an X in the box that indicates where you feel **good technical translations** should be in relation to those two views.

If you are not sure about the meaning of these views, **please answer based on your intuition**. (If you do not understand at all, kindly select "I do not understand.")

Literal translation	☐	☐	☐	☐	☐	☐	☐	☐	☐	Idiomatic translation	I do not understand. ☐
Word-for-word equivalence	☐	☐	☐	☐	☐	☐	☐	☐	☐	Sense-for-sense equivalence	I do not understand. ☐
Message	☐	☐	☐	☐	☐	☐	☐	☐	☐	Form	I do not understand. ☐
Easy to understand	☐	☐	☐	☐	☐	☐	☐	☐	☐	Precise	I do not understand. ☐
Same effect on the reader	☐	☐	☐	☐	☐	☐	☐	☐	☐	Faithful to the author's message	I do not understand. ☐
Close to the original	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reads like an original	I do not understand. ☐
Overt translation (Looks like a translation)	☐	☐	☐	☐	☐	☐	☐	☐	☐	Covert translation (Looks like an original)	I do not understand. ☐

Question 44

Do you hold a degree in translation?

☐ No.
☐ Yes. Please specify:_____

Question 45

Do you hold a science degree?

☐ No.
☐ Yes. Please specify:_____

Question 46

What is your age group?

☐ 16-19 ☐ 20-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ 60-69 ☐ 70-79 ☐ 80+

Question 47

What is your native language? That is, what is the first language that you learned as a child?

Question 48

What language do you speak most often at home?

Question 49

Please list your four strongest languages below and rate your proficiency level for speaking, reading, and writing on a scale of 0 to 5 (0 being the lowest).

➘ List your four strongest languages		0 Zero Proficiency	1 Elementary Proficiency	2 Limited Working Proficiency	3 Professional Working Proficiency	4 Full Professional Proficiency	5 Native/ Bilingual Proficiency
	Speak	☐	☐	☐	☐	☐	☐
____________________	Read	☐	☐	☐	☐	☐	☐
	Write	☐	☐	☐	☐	☐	☐
	Speak	☐	☐	☐	☐	☐	☐
____________________	Read	☐	☐	☐	☐	☐	☐
	Write	☐	☐	☐	☐	☐	☐
	Speak	☐	☐	☐	☐	☐	☐
____________________	Read	☐	☐	☐	☐	☐	☐
	Write	☐	☐	☐	☐	☐	☐
	Speak	☐	☐	☐	☐	☐	☐
____________________	Read	☐	☐	☐	☐	☐	☐
	Write	☐	☐	☐	☐	☐	☐

You have reached the end of the questionnaire.

We warmly thank you for investing your time and effort in answering this questionnaire. Because of your help, we are closer to achieving our research objectives: to draft a comprehensive picture of technical translation processes at Festo Didactic and answer related research questions. Kindly note that you will receive a link to the final research thesis upon its completion.

As mentioned on the Information and Consent form, if you have questions about the scientific or scholarly aspects of this research, please contact the researcher, Claudine (Pierre-Antoine) Belhomme claudine.belhomme@hotmail.com or 1 (902) 580-5885. You may also contact her faculty supervisor, Deborah Folaron, at debbie.folaron@concordia.ca or (514) 848-2424 ext. 7516.

If you have concerns about ethical issues in this research, please contact the Manager, Research Ethics, Concordia University, (514) 848-2424 ex. 7481 or oor.ethics@concordia.ca.

FESTO DIDACTIC TRANSLATOR SURVEY

Thank you for agreeing to answer this survey.
Kindly answer each question according to your experience at Festo Didactic.

Question 1

How useful would you find each kind of training for **your role**? (Check one box per row.)

Training Topic	**Very** useful	**Fairly** useful	**Not very** useful	**N/A**
SOFTWARE TRAINING				
Across advanced functions	☐	☐	☐	☐
AutoCAD Inventor advanced functions	☐	☐	☐	☐
Cosima or other CMS advanced functions	☐	☐	☐	☐
Machine translation post-editing	☐	☐	☐	☐
Product Information Management advanced functions	☐	☐	☐	☐
Quality assurance software advanced functions	☐	☐	☐	☐
Terminology software advanced functions	☐	☐	☐	☐
Other software:_____	☐	☐	☐	☐
USABILITY TRAINING				
Accessibility (techniques for adapting written documents to support people with disabilities)	☐	☐	☐	☐
Didactic methods (techniques for improving readers' understanding and retention)	☐	☐	☐	☐
Usability techniques (techniques for increasing a document's ease of use and readers' effectiveness and satisfaction)	☐	☐	☐	☐
LANGUAGE TRAINING				
Source language (improving vocabulary & grammar)	☐	☐	☐	☐
Target language (improving vocabulary, grammar & style)	☐	☐	☐	☐
Revision/proofreading methods	☐	☐	☐	☐
Terminology research	☐	☐	☐	☐
Translation methods and strategies	☐	☐	☐	☐
OTHER TRAINING				
Project management	☐	☐	☐	☐
Technical/scientific subjects	☐	☐	☐	☐
Other:_____	☐	☐	☐	☐

Question 2

From which language(s) to which language(s) do you translate at Festo Didactic? (Please list all language combinations and directions.)

Question 3

What guidelines must you follow to perform your work? (Check all that apply.)

☐ Accessibility guidelines
☐ Didactic guidelines
☐ Festo style guides
☐ Naming conventions
☐ Procedural guidelines
☐ Terminology guidelines
☐ Usability guidelines
☐ Other, please specify:_____

Question 4

How easy is it for you to **consult** the following guidelines?

	Easy	Average	Difficult	N/A
Accessibility guidelines	☐	☐	☐	☐
Didactic guidelines	☐	☐	☐	☐
Festo style guide	☐	☐	☐	☐
Naming conventions	☐	☐	☐	☐
Procedural guidelines	☐	☐	☐	☐
Quality evaluation metric	☐	☐	☐	☐
Regulatory reference guides	☐	☐	☐	☐
Terminology guidelines	☐	☐	☐	☐
Usability guidelines	☐	☐	☐	☐

Question 5

What characteristics should a **good technical translation** have? (Please be as detailed as possible.)

Question 6

How is **technical translation different** in practice **from general translation** at Festo Didactic?

Question 7

How often do you **worry** about the following?

	Never	Rarely	Sometimes	Often	Always
Given the limited time to complete this translation, is the quality of my translation sufficient for its use?	☐	☐	☐	☐	☐
Will the quality of this translation satisfy the client?	☐	☐	☐	☐	☐
Will the users of this translation (ex.: teachers, assembly technicians, students) notice that it is a translation?	☐	☐	☐	☐	☐
Will the users of this translation understand the terminology used?	☐	☐	☐	☐	☐
Am I using translation best practices?	☐	☐	☐	☐	☐
Can I work faster?	☐	☐	☐	☐	☐
How can I know whether my translation is good enough?	☐	☐	☐	☐	☐

Question 8

Question 5A) How useful would it be for you to have easy digital access to each resource?
Question 5B) Do you already have access to this resource?
Please answer BOTH Question 5A) AND Question 5B)!

	Very useful	Pretty useful	Not useful	I don't know	I have access
Books on technical subjects in the **source** language (electronics, robotics)	☐	☐	☐	☐	☐
Books on technical subjects in the **target** language	☐	☐	☐	☐	☐
Bilingual concordance	☐	☐	☐	☐	☐
Collections of unilingual or multilingual texts for terminology research (such as BNC and WebCorp)	☐	☐	☐	☐	☐
Specialized and general dictionaries	☐	☐	☐	☐	☐
Grammar reference books	☐	☐	☐	☐	☐
Multilingual glossaries or terminology databases (such as IATE, Termium, and UNTERM)	☐	☐	☐	☐	☐
National writing style guides	☐	☐	☐	☐	☐
Other:_____	☐	☐	☐	☐	☐

Question 9

Technical language tends to be more precise and consistent than everyday language. Some technical terms may be unknown to the reader, who might refer to the same concepts using different words.

This difference may be a source of misunderstanding. What methods can a translator use to increase the likelihood of using the same terms as his readers would use (such as instructors and students)?

Question 10

How would you assess the clarity of the original language content that you receive for translation? (Please be as specific as possible.)

Question 11

When a translation is modified in the revision or proofreading stages, is the **translation memory** systematically updated?

☐ Yes

☐ No

Question 12

How would you rate the **quality** level of the **current translation memories**? (Check one.)

Very good	Good	Satisfactory	Unsatisfactory	I do not know/ N/A
☐	☐	☐	☐	☐

If not **very good**, what could be improved?

Question 13

Where do you **store new terms**? (Check all that apply.)

☐ Terminology database developed in-house (ex.: Access, SQL)

☐ Your own database (ex.: Access, SQL)

☐ Spreadsheet (ex.: Excel)

☐ Physical terminology cards or physical notebook

☐ Terminology database software

☐ Terminology database integrated into Across (or other translation memory software)

☐ Other, please specify:_____

Question 14

What information do you include for each term (that is, for each separate entry) in your terminology storage? (Please list every element you include.)

Question 15

How would you rate the **quality** level of the **current terminology database(s)**? (Check one.)

Very good	Good	Satisfactory	Unsatisfactory	I do not know/ N/A
☐	☐	☐	☐	☐

If not **very good**, what could be improved?

Question 16

How important do you consider each element in a **technical translation**? (Check one for each row.)

	Very important	Of average importance	Not very important	I do not know.
Accurate numbers	☐	☐	☐	☐
Accurate terminology	☐	☐	☐	☐
Appears as if it is not a translation	☐	☐	☐	☐
Clear (easy to understand)	☐	☐	☐	☐
Faithful to the original	☐	☐	☐	☐
Literal translation	☐	☐	☐	☐
Same effect on the reader as the original	☐	☐	☐	☐
True to the message	☐	☐	☐	☐
Word-for-word equivalence	☐	☐	☐	☐
Other:_____	☐	☐	☐	☐

Question 17

Considering sources of risks to physical safety, how much do you agree that translated texts add an additional layer of safety risks? (Check one.)

Mostly agree	Agree	Neither agree nor disagree	Disagree	Mostly disagree
☐	☐	☐	☐	☐

Please explain your answer:

Question 18

In the spirit of continuous improvement, at which one of the three priority levels should the following aspects of translation quality be the object of improvement efforts at Festo Didactic?

	First priority	**Second** priority	**Third** priority	**N/A**
TEXT IMPROVEMENTS				
Accessibility of content (for people with disabilities)	☐	☐	☐	☐
Accuracy (precise facts and numbers)	☐	☐	☐	☐
Clarity (easy to understand)	☐	☐	☐	☐
Correctness of the terminology	☐	☐	☐	☐
Faithfulness to the original	☐	☐	☐	☐
Grammar, syntax	☐	☐	☐	☐
Naturalness (reads like an original text, idiomatic)	☐	☐	☐	☐
Respect of country-specific writing conventions	☐	☐	☐	☐
Usability (easy to use)	☐	☐	☐	☐
Word choice	☐	☐	☐	☐
PROCESS IMPROVEMENTS				
Easier access to reference material	☐	☐	☐	☐
More team communication during projects	☐	☐	☐	☐
More relevant training	☐	☐	☐	☐
Better quality assurance procedures	☐	☐	☐	☐
Better use of QA features in Across or COSIMA	☐	☐	☐	☐
Streamlining the translation process	☐	☐	☐	☐
Other, specify: _____	☐	☐	☐	☐

Question 19

Could you name three things that would make your work as a translator easier?

1)
2)
3)

Question 20

What would you like to see remain unchanged in your work? (Be as specific as possible.)

Question 21

If there were no limits on company resources, what would you suggest doing to **improve translation quality**?

...to **shorten translation time**?

Question 22

Do you have any additional suggestions to improve the overall performance of Festo Didactic?

Question 23

In your work at Festo Didactic, how often do you personally perform the following? (Check one box per row.)

	Daily	**Several times per week**	**Several times per month**	**Less than once a month**	**Never**
Align bilingual texts/content	☐	☐	☐	☐	☐
Start a new translation project	☐	☐	☐	☐	☐
Manage terminology databases	☐	☐	☐	☐	☐
Clean up translation memories	☐	☐	☐	☐	☐
Attend training	☐	☐	☐	☐	☐
Meet together to discuss how to make course corrections	☐	☐	☐	☐	☐

Question 24

How easily can you perform the following activities?

	Very easily	Easily	Not so easily	N/A
Aligning texts (i.e. storing source texts with its corresponding translated texts)	☐	☐	☐	☐
Using the quality assurance (QA) features in Across	☐	☐	☐	☐
Using the concordance feature in Across	☐	☐	☐	☐
Extracting information from an electronic collection of technical texts	☐	☐	☐	☐
Automatically extracting terminology from a document	☐	☐	☐	☐
Performing terminology research	☐	☐	☐	☐

Question 25

Let us suppose that each row of boxes represents a continuous spectrum between two views on translation quality. Place an X in the box that indicates where you feel **good technical translations** should be in relation to those two views.

If you are not sure about the meaning of these views, **please answer based on your intuition**. (If you do not understand at all, kindly select "I do not understand.")

Literal translation	☐	☐	☐	☐	☐	☐	☐	☐	☐	Idiomatic translation	I do not understand. ☐
Word-for-word equivalence	☐	☐	☐	☐	☐	☐	☐	☐	☐	Sense-for-sense equivalence	I do not understand. ☐
Message	☐	☐	☐	☐	☐	☐	☐	☐	☐	Form	I do not understand. ☐
Easy to understand	☐	☐	☐	☐	☐	☐	☐	☐	☐	Precise	I do not understand. ☐
Same effect on the reader	☐	☐	☐	☐	☐	☐	☐	☐	☐	Faithful to the author's message	I do not understand. ☐
Close to the original	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reads like an original	I do not understand. ☐
Overt translation (Looks like a translation)	☐	☐	☐	☐	☐	☐	☐	☐	☐	Covert translation (Looks like an original)	I do not understand. ☐

Question 26

What is your age group?

☐ 16-19 ☐ 20-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ 60-69 ☐ 70-79 ☐ 80+

Question 27

Do you hold a degree in translation?

☐ No.
☐ Yes. Please specify:

Question 28

Do you hold a science degree?

☐ No.
☐ Yes. Please specify:

Question 29

What is your native language? That is, what is the first language that you learned as a child?

Question 30

What is the language you speak most often at home?

Question 31

Please list your four strongest languages below and rate your proficiency level for speaking, reading and writing on a scale of 0 to 5 (0 being the lowest)?

List your four strongest languages		0 Zero Proficiency	1 Elementary Proficiency	2 Limited Working Proficiency	3 Professional Working Proficiency	4 Full Professional Proficiency	5 Native/ Bilingual Proficiency
	Speak	☐	☐	☐	☐	☐	☐
________________	Read	☐	☐	☐	☐	☐	☐
	Write	☐	☐	☐	☐	☐	☐
	Speak	☐	☐	☐	☐	☐	☐
________________	Read	☐	☐	☐	☐	☐	☐
	Write	☐	☐	☐	☐	☐	☐
	Speak	☐	☐	☐	☐	☐	☐
________________	Read	☐	☐	☐	☐	☐	☐
	Write	☐	☐	☐	☐	☐	☐
	Speak	☐	☐	☐	☐	☐	☐
________________	Read	☐	☐	☐	☐	☐	☐
	Write	☐	☐	☐	☐	☐	☐

You have reached the end of the questionnaire.

We warmly thank you for investing your time and effort in answering this questionnaire. Because of your help, we are closer to achieving our research objectives: to draft a comprehensive picture of technical translation processes at Festo Didactic and answer related research questions. Kindly note that you will receive a link to the final research thesis upon its completion.

As mentioned on the Information and Consent form, if you have questions about the scientific or scholarly aspects of this research, please contact the researcher, Claudine (Pierre-Antoine) Belhomme claudine.belhomme@hotmail.com or 1 (902) 580-5885. You may also contact her faculty supervisor, Deborah Folaron, at debbie.folaron@concordia.ca or (514) 848-2424 ext. 7516.

If you have concerns about ethical issues in this research, please contact the Manager, Research Ethics, Concordia University, (514) 848-2424 ex. 7481 or oor.ethics@concordia.ca.

FESTO DIDACTIC WRITER SURVEY

Thank you for agreeing to answer this survey.
Kindly answer each question according to your experience at Festo Didactic.

Question 1

How useful would you find each kind of training for **your role**? (Check one box per row.)

Training Topic	**Very** useful	**Fairly** useful	**Not very** useful	**N/A**
SOFTWARE TRAINING				
AutoCAD Inventor advanced functions	☐	☐	☐	☐
Cosima or other CMS advanced functions	☐	☐	☐	☐
Product Information Management advanced functions	☐	☐	☐	☐
Quality assurance software advanced functions	☐	☐	☐	☐
Terminology software advanced functions	☐	☐	☐	☐
Other software:_____	☐	☐	☐	☐
USABILITY TRAINING				
Accessibility (techniques for adapting written documents to support people with disabilities)	☐	☐	☐	☐
Didactic methods (techniques for improving readers' understanding and retention)	☐	☐	☐	☐
Usability techniques (techniques for increasing a document's ease of use and readers' effectiveness and satisfaction)	☐	☐	☐	☐
LANGUAGE TRAINING				
Language development (improving vocabulary, grammar & style)	☐	☐	☐	☐
Revision/proofreading methods	☐	☐	☐	☐
Terminology research	☐	☐	☐	☐
OTHER TRAINING				
Project management	☐	☐	☐	☐
Technical/scientific subjects	☐	☐	☐	☐
Other:_____	☐	☐	☐	☐

Question 2

In which languages do you write content for Festo Didactic?

Question 3

What guidelines must you follow to perform your work? (Check all that apply.)

☐ Accessibility guidelines
☐ Didactic guidelines
☐ Festo style guides
☐ Naming conventions
☐ Procedural guidelines
☐ Terminology guidelines
☐ Usability guidelines
☐ Other, please specify:_____

Question 4

How easy is it for you to **consult** the following guidelines?

	Easy	Average	Difficult	N/A
Accessibility guidelines	☐	☐	☐	☐
Didactic guidelines	☐	☐	☐	☐
Festo style guide	☐	☐	☐	☐
Naming conventions	☐	☐	☐	☐
Procedural guidelines	☐	☐	☐	☐
Quality evaluation metric	☐	☐	☐	☐
Regulatory reference guides	☐	☐	☐	☐
Terminology guidelines	☐	☐	☐	☐
Usability guidelines	☐	☐	☐	☐

Question 5

Question 5A) How useful would it be for you to have easy digital access to each resource?
Question 5B) Do you already have access to this resource?
Please answer BOTH Question 5A) AND Question 5B)!

	Very useful	Fairly useful	Not very useful	I do not know	I have access
Books on technical subjects (electronics, robotics)	☐	☐	☐	☐	☐
Collections of texts for terminology research	☐	☐	☐	☐	☐
Specialized and general dictionaries	☐	☐	☐	☐	☐
Grammar reference books	☐	☐	☐	☐	☐
Glossaries or terminology databases	☐	☐	☐	☐	☐
National writing style guides	☐	☐	☐	☐	☐

Question 6

What characteristics should a **good technical translation** have? (Please be as detailed as possible.)

Question 7

Which of the following **internationalization** strategies, if any, do you use when you write texts for translation? Note: *Internationalization* refers to methods of writing a text that facilitate its adaptation into different languages and cultures. (Check all that apply.)

☐ Avoiding country-specific or cultural references
☐ Reducing the need for lengthy technical documents, such as increased use of illustrations
☐ Leaving additional white space to allow for easy formatting when translated into lengthier languages
☐ Controlled authoring
☐ Character encoding
☐ Other, please specify:_____

Question 8

Technical language tends to be more precise and consistent than everyday language. Some technical terms may be unknown to the reader, who might refer to the same concepts using different words.

This difference may be a source of misunderstanding. What methods can a technical writer use to increase the likelihood of using the same terms as his readers would use (such as instructors and students)?

Question 9

Where do you store new terms? (Check all that apply.)

☐ Terminology database developed in-house (ex. : Access, SQL)
☐ Your own database (ex.: Access, SQL)
☐ Spreadsheet (ex.: Excel)
☐ Physical terminology cards or physical notebook
☐ Terminology database software
☐ Terminology database integrated into Across (or other translation memory software)
☐ Other, please specify:_____

Question 10

What information do you include for each term (that is, for each separate entry) in your terminology storage? (Please list every element you include.)

Question 11

How would you rate the **quality** level of the **current terminology database(s)**? (Check one.)

Very good	Good	Satisfactory	Unsatisfactory	I do not know/N/A
☐	☐	☐	☐	☐

If not **very good**, what could be improved?

Question 12

How important do you consider each element in a **technical translation**? (Check one for each row.)

	Very important	Of average importance	Not very important	I do not know.
Accurate numbers	☐	☐	☐	☐
Accurate terminology	☐	☐	☐	☐
Appears as if it is not a translation	☐	☐	☐	☐
Clear (easy to understand)	☐	☐	☐	☐
Faithful to the original	☐	☐	☐	☐
Literal translation	☐	☐	☐	☐
Same effect on the reader as the original	☐	☐	☐	☐
True to the message	☐	☐	☐	☐
Word-for-word equivalence	☐	☐	☐	☐
Other:_____	☐	☐	☐	☐

Question 13

Technical writing is a core activity of Festo Didactic. Could you name three things that would make your work as a technical writer easier?

1)
2)
3)

Question 14

What would you like to see remain unchanged in your work? (Be as specific as possible.)

Question 15

Let us suppose that each row of boxes represents a continuous spectrum between two views on translation quality. Place an X in the box that indicates where you feel **good technical translations** should be in relation to those two views.

If you are not sure about the meaning of these views, **please answer based on your intuition**. (If you do not understand at all, kindly select "I do not understand.")

Literal translation	☐	☐	☐	☐	☐	☐	☐	☐	☐	Idiomatic translation	I do not understand. ☐
Word-for-word equivalence	☐	☐	☐	☐	☐	☐	☐	☐	☐	Sense-for-sense equivalence	I do not understand. ☐
Message	☐	☐	☐	☐	☐	☐	☐	☐	☐	Form	I do not understand. ☐
Easy to understand	☐	☐	☐	☐	☐	☐	☐	☐	☐	Precise	I do not understand. ☐
Same effect on the reader	☐	☐	☐	☐	☐	☐	☐	☐	☐	Faithful to the author's message	I do not understand. ☐
Close to the original	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reads like an original	I do not understand. ☐
Overt translation (Looks like a translation)	☐	☐	☐	☐	☐	☐	☐	☐	☐	Covert translation (Looks like an original)	I do not understand. ☐

Question 16

Considering sources of risks to physical safety, how much do you agree that translated texts add an additional layer of safety risks? (Check one.)

Mostly agree	Agree	Neither agree nor disagree	Disagree	Mostly disagree
☐	☐	☐	☐	☐

Please explain your answer:

Question 17

What is your age group?

☐ 16-19 ☐ 20-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ 60-69 ☐ 70-79 ☐ 80+

Question 18

Do you hold a degree in writing?

☐ No
☐ Yes. Please specify:

Question 19

Do you hold a science degree?

☐ No
☐ Yes. Please specify:

Question 20

What is your native language? That is, what is the first language that you learned as a child?

Question 21

What is the language you speak most often at home?

Question 22

Do you have any suggestions to improve the overall performance of Festo Didactic?

Question 23

Please list your three strongest languages below and rate your proficiency level for speaking, reading and writing on a scale of 0 to 5 (0 being the lowest)?

↓ List your three strongest languages		0 Zero Proficiency	1 Elementary Proficiency	2 Limited Working Proficiency	3 Professional Working Proficiency	4 Full Professional Proficiency	5 Native/ Bilingual Proficiency
	Speak	☐	☐	☐	☐	☐	☐
____________________	Read	☐	☐	☐	☐	☐	☐
	Write	☐	☐	☐	☐	☐	☐
	Speak	☐	☐	☐	☐	☐	☐
____________________	Read	☐	☐	☐	☐	☐	☐
	Write	☐	☐	☐	☐	☐	☐
	Speak	☐	☐	☐	☐	☐	☐
____________________	Read	☐	☐	☐	☐	☐	☐
	Write	☐	☐	☐	☐	☐	☐

You have reached the end of the questionnaire.

We warmly thank you for investing your time and effort in answering this questionnaire. Because of your help, we are closer to achieving our research objectives: to draft a comprehensive picture of technical translation processes at Festo Didactic and answer related research questions. Kindly note that you will receive a link to the final research thesis upon its completion.

As mentioned on the Information and Consent form, if you have questions about the scientific or scholarly aspects of this research, please contact the researcher, Claudine (Pierre-Antoine) Belhomme claudine.belhomme@hotmail.com or 1 (902) 580-5885. You may also contact her faculty supervisor, Deborah Folaron, at debbie.folaron@concordia.ca or (514) 848-2424 ext. 7516.
If you have concerns about ethical issues in this research, please contact the Manager, Research Ethics, Concordia University, (514) 848-2424 ex. 7481 or oor.ethics@concordia.ca.