

Chapter 1

Translation facilitates the flow of ideas, expertise, values and other information between different cultures. It also facilitated some of the most significant scientific and technological advances of recent decades. These advances have transformed our daily lives.

What many people do not realize is that these inventions and advances are accompanied at almost every step of the way by translation in its capacity as a vehicle for disseminating scientific and technical knowledge.

Scientific and technical texts

While the two areas are separate in many ways, the ways in which they appear in the real world mean that they need to be considered together.

Technical text: designed to convey information as clearly and effectively as possible.

Scientific text: discuss, analyze and synthesize information with a view to explaining ideas, proposing new theories or evaluating methods.

Historical significance

That translation has accompanied virtually every significant scientific and technological discovery throughout the ages is well documented and it is difficult to find a single example of an invention or discovery which was not exported to another language and culture by means of translation.

While translation has always facilitated the dissemination of knowledge, it was not until the 15th century that it really came into its own. In 1447, Johannes Gutenberg developed the first moveable type printing system which made it easier to produce and own books. This invention had such an impact on translation. Not only did this make it easier to distribute original language texts, it also made it easier to disseminate information in translation.

At that time, scientists were making countless new discoveries and writing about their findings in their own native language. With other researchers eager to acquire new knowledge and learn new techniques, the demand for translations of these scientific texts was unprecedented.

Were it not for translation, each language area would be intellectually isolated and each language community would have to discover the entire body of scientific and technical knowledge for itself.

Roman translators were no less cavalier in their approach to scavenging knowledge and passing it off as their own. Indeed, the Romans described these practices as invention (inventio), which involved the rewriting or rewording of

the original during translation, and *contaminare* (contamination), which involved combining translation together from different sources to form an entirely new work.

This changed with the advent of relatively high volume printing as facilitated by Gutenberg's invention. Texts became fixed –objects to be respected and not written and copied by anyone. The process of printing texts on paper binding them gave the knowledge they contained legitimacy and permanency which had rarely existed previously. The existence of a fixed and standardized source text made translators more accountable for omissions and mistranslations because it was easier to consult the original source text.

Modern scientific and technical translation

Today, scientific and technical translation represents the backbone of international trade. Virtually every product sold or specialized service provided will require the involvement of scientific and technical translators at some point in its lifecycle.

Scientific and technical translation now accounts for some 90% of global translation output.

Translation is the subject of numerous laws, regulations and directives and many international scholarly scientific journals, even those which publish papers in various languages, require translations of abstracts at the very least.

Some legal dimensions

The translation of documents in these domains is an activity which is required by law. In Europe, EU Council Resolution C411 specifically states that in order to be able to legally sell or distribute technical products and appliances, all technical documentation relating to the product must be translated into the language(s) of the country where the product is to be sold. A result of the Directive is that products are only regarded as being complete when they are accompanied by full operating instructions in the users' own language; if there are problems or inaccuracies in the instructions, the whole product can be regarded as defective.

Instructions must be clear, comprehensible and must provide clear warnings to prevent misuse of products and to advise users of possible risks and hazards.

There is a huge demand for translators. Translations: are regarded as original target language documents.

A place for translation theory?

One of the most difficult aspects of translation theory is that scientific and technical translation have traditionally been neglected by scholars and none of the mainstream theories really addresses scientific and technical translation specifically.

Difficulties also arise because many theories of translation adopt a binary approach to translation consisting of diametrically opposed extremes.

Translation inevitably involves shades of grey –new scenarios, unusual combinations of factors and so on - which means that trying to shoe-horn a translation into one category or the other is often uncomfortable.

Recreating the source text

Traditionally, the source text has been regarded as the most important element in translation, particularly as it is the starting point for the whole process and the basis upon which target texts are produced. In recent years, the focus of translation theory has shifted away from frameworks based on the source text towards a more communicative approach. Translation is increasingly being regarded as a communicative process and the guiding factors are the message and recipient (the content and the target audience).

The emphasis on the source text is perhaps most apparent in definitions and types of equivalence which rely a link or bond between the source text and the target text. This relationship allows the target text to be considered a translation of the source text.

The target text could not function as a translation without the ever-present source text.

The most well known types of equivalence are:

Formal equivalence: concerned with the message in terms of its form and content. The message in the TL should match the different elements in the SL as closely as possible.

Dynamic equivalence: based on the notion that the TT should have the same effect on its audience as the ST had on its audience. The emphasis is on creating the same relationship between the target audience and the message as that which existed between the SL audience and the message. The aim is to produce a TT which is natural and idiomatic and which focuses on the TL culture. A successful translation needs to capture the sense of the ST and not just the words. Successful if the message is successfully transmitted to the target audience.

Equivalence can occur on the following levels (Koller):

- Denotational meaning, namely the object or concept being referred to;
- Connotational meaning, divided into language level, sociolect, dialect, medium, style, etc;
- Textual norms, typical language features of texts such as legal documents, business letters, etc;
- Pragmatic meaning, which includes reader expectations;
- Linguistic form, namely devices such as metaphors, rhyme, etc.

Each of these levels gives rise to a particular type of equivalence. In scientific and technical texts, achieving equivalence on any of these levels might require the translator to focus on the information being communicated (dm) in the case of an instruction manual, on the way in which information is expressed (lf) in a popular science article or on set phrases and document conventions (tn) in the case of a certificate of conformity.

Translators may find themselves having to settle for lower levels of equivalence on one or more of the remaining levels.

The instance of equivalence-based approaches on maintaining what some would regard as excessively close links between the TT and the ST and its original audience seems incongruous when the point of translation is to communicate to a new audience. Equivalence can also be criticized for its general difficulty in incorporating real-world, extratextual issues such as time constraints, preferred terminology and style, etc.

These levels of equivalence give us the ability to compare S and T texts, once a translation has been produced.

Scientific and technical translations will be treated as if they were originally produced in the TL and not as translations. Equivalence does not take into account those real-world issues which play as much a role in shaping the translation process as the S and T languages, the text and its content, etc. All we can expect to achieve using the various levels of equivalence is describe how the S and T texts relate to one another after the translation has been completed. A helpful way of using equivalence is to employ its levels as a set of tools or policies which can be selected in order to achieve some translation goal.

Focusing on the TT

Skopos theory: the TT, or more precisely the purpose of the TT, is the most important in determining the way we should translate texts. Based on the principle that translation is a communicative activity, which is performed for a specific reason. It is this purpose, which is known as the skopos, which governs the translation process, unlike equivalence where the ST and its effects on the SL audience determine the translation process, or functionalism, where the ST function defines the TT function and the translation process.

The Skopos of the TT is specified by the commissioner and the translator. A text is an offer of information (raw materials from which a number of possible translations can be produced). The way in which a translator selects the “correct” translation depends on the intended purpose of the translation being known.

The Skopos theory introduces the notion of the translation brief, which is defined as a form of project specification which sets out the requirements for the translation. This brief is intended to form the basis for identifying the Skopos of the translation and is supposed to clearly define what the translation is to be used for and who will use it.

It can be problematic from the point of view that the Skopos of a translation is based on the undefined notion of the translation brief, which is open to interpretation and may be very difficult to formulate because translators are rarely given meaningful translation briefs or commissions. One method of reconciling the problem might be to combine the best features of the Skopos theory, equivalence theory and work carried out on text typologies.

Technology plays a crucial role in scientific and technical translation.

Commercial translation has always required the use of certain tools. The benefits to translators were modest and came in the form of slight improvements in the presentation of translations or faster delivery of texts.

It is only since around the mid-1990s that the Internet has truly made its mark on translation.

Computers and the internet has created new demands for translations and placed new demands on translators, requiring them to adopt new technologies and practices. Technology facilitated global business; it creates a demand for new processes which inevitably involve the use of technology. Translation became a computer-based activity.

Today’s scientific and technical translator has to contend not only with word-processing and sending files by email or electronic file transfer, but receiving documents in a bewildering array of file types which often have to be handled using specialized software.

General tools

This category forms the basic level of IT competence which is needed to be able to function in any career and it consists of general PC skills such as maintenance, installation and deinstallation of software, data archival and backups, etc.

Text processing tools

All translators need to be proficient in the use of basic word-processing packages. Understanding Microsoft Word, OpenOffice, to be able to work effectively as a translator.

For scientific and technical translators, certain types of documents, are so large and complex as a result of formatting, cross-referencing and graphics that they are produced using DTP software such as Adobe FrameMaker.

Translation tools

Tools which are designed specifically for translators. Frequently referred to as Computer-Assisted Translation or CAT tools, they include translation memory systems, terminology management system, electronic corpora, etc. They are commonly used in technical translation where the nature of documents means a high proportion of repetition and where new product releases require existing documents to be updated. CAT tools require significant investment.

Participants in the translation process (Sager):

- Producers: the author of the ST (professional or subject-specialist)
- Mediators: translators, editors (modifies the text)
- Communication agents: the commissioner of a text or translation
- Recipient: intended end user

The translator

Performs a role that is essential and extremely complex.

Staff translators: employed by large companies and translate documents produced by the company. They generally deal with specific subject areas and quite often, specific range of text types. The texts and subjects rarely change. They have highly specialized knowledge of the subject area.

In-house translators: employed by companies on a full-time basis. They work for translation companies or localization vendors. Translators often work outside their comfort zones.

Teams of translators to certain key clients, forming a “virtually translation department”. Such teams will deal exclusively with projects for a specific client.

Freelance translators: (largest group in the world) are self-employed and are responsible for finding their own work. Some freelancer may also join an online translator community (ProZ) to find work but such practices are widely criticized by professional translators who blame sites like this for reducing rates of pay for translators and promoting the use of unqualified translators.

They pick their own subjects and will often need to take work on several areas. They can join forces with other freelancers in order to take on translation projects which are too large for one translator to handle within the time available.

Freelancing requires motivation, determination and courage. They choose their own working hours, flexibility, and quite often, higher levels of incomes than in-house or staff translators.

Senior translators are often called to set and evaluate test translations which are given to job applicants. Depending on the level of the position being applied for, the applicant may be permitted to make a certain amount of mistakes and still be considered for the job.

Translators may also be asked to provide reports on the cultural appropriateness of various types of communications.

Clients

Obvious clients for scientific and technical translators

- Engineering: the texts involved relate to different fields and applications of chemistry, physics or biology.
- Transport: companies involved in the aerospace or automotive industries, railway engineering, public transport, etc
- Information technology: software and hardware companies (involved with the internet)
- Research organizations: government think tanks, standards institutions, safety organizations, public service bodies, etc.

Less obvious:

- Commercial entities: insurance companies, banks and venture capitalists who may require detailed technical information in order to invest in new innovations, etc
- Service providers: training centres, technical consultants, etc.
- Individuals: anyone who, for whatever reason, needs to access scientific and technical information whether for personal reasons or for research reasons.

Chapter 2

What is technical communication?

The purpose of technical communication is to help people understand how something works or how to carry out a procedure, as a means to perform things quickly and safely, and avoiding any mistakes or even dangerous situations that can arise when using something. What this type of communication does to achieve it is to combine text and graphics to present complex information in a way that makes it easier to follow and understand for a particular audience in a particular moment.

These types of documents are produced by technical professionals and technical communicators. The first ones are the subject experts such as engineers, technicians and scientists that develop all the data and knowledge communicated in the texts, and in many cases they write their own texts at the same time they perform their primary task. Since they are usually no experts in

communication, many of them don't want to spend much time writing their procedures (that can take up to 40% of their time).

The latter ones are technical communicators. Unlike the technical professionals, they normally don't have the same in-depth technical knowledge, but they are better in terms of conveying the information and they like to write so they do it full-time.

What we haven't mentioned yet in this scenario is the figure of the translator. They obviously play an important part on technical communication, since they will have to deal with many of these documents and present them to a new language audience as if it was the original text. Although translators haven't been recognized in traditional definitions of technical communication, the modern ones have included them and they are also considered "technical communicators".

We need to understand then that technical communication provides the material which translators will work with, and many authors consider that it is necessary to be a good technical writer in order to be a good technical translator.

Features of technical communication

Technical communication addresses specific readers

All technical documents focus on a specific purpose, such as helping users to perform a task, demonstrating a particular concept, or providing information to make decisions. Therefore, technical documents are seen as task-orientated tools aimed at particular group or groups of people. Knowing the intended audience of the text is essential, and this can be a difficult issue in many cases, because there might be multiple audiences for a text, each of them having different reasons to read it, as we will see later. The main fact to consider then is that technical documents are conceived, designed and produced to cover the needs of a specific group.

Technical communication is a tool

Texts are tools, a means to an end which is outside the text itself. The text should not be the focus of attention. The aim is to convey the right information to the right people in the right format so that they can get their own jobs.

There is an exception to this general rule and that is the subcategory of scientific writing. In this category of text, we are communicating a different type of information. Writers may need to invent terms for new concepts, use

various rhetorical devices in order to convince readers of the merits of the information being presented and to entertain them.

In these cases, creativity and literary prowess are often essential in order to achieve a communicative goal.

Technical communication is often produced collaboratively

Technical documents are frequently the product of several people working together. Documents may be produced by teams of technical writers or other contributors, each writing specific sections of the text. Even where only one writer is involved, documents pass through several cycles of review by various people such as technical experts, marketing people, etc. It is very easy for stylistic inconsistencies because different people have different ways of writing and they may not adhere to style guides consistently.

For translators this means that sometimes the same concept is referred to using different terms throughout a document or the text suddenly stops making sense.

Technical documents are often translated by teams of translators. The problem of inconsistencies in style has to deal with, usually by an editor or a senior translator, or a freelancer.

Technical communication uses design to improve usability

The font and its size, the colours: cosmetics factors.

Technical documents frequently use graphics to reinforce and support textual information or to convey large amounts of information quickly and clearly.

As a translator, you will have to work with and around them and you can also play a significant role in ensuring the usability of information in documents.

Technical communication uses a variety of technologies

Technical translators can expect to be exposed to a range of technologies which are used to produce technical documents. The nature and complexity of a document will necessitate the use of one tool or another.

The variety of media used to produce and distribute technical information is a key characteristic.

Who reads technical documentation?

Finding out who the audience is

Knowing who is going to read your translation means you can write specifically for them and give them the type of text they need

1) Audience

The notion of audience is one with which most of us are very familiar, but despite the ubiquity of the audience, it is still a surprisingly abstract and fuzzy concept which is difficult to define in any concrete way.

Technical writers, too, struggle with figuring out who their audience will be. In many cases, it is simply not possible to create a detailed profile of our audience.

2) Rosenberg

Rosenberg acknowledges both the need to identify your audience as well as the difficulty in doing this. He proposes two simple questions which, when properly followed through and analyzed, can provide a wealth of information to help us.

What does my audience already know about this technology?

What is the native language of my audience?

By understanding what the audience knows about a particular technology we can decide whether or not we need to provide additional explanations and foreground particular facts or whether we can omit certain facts; this also tells us whether we need to avoid specialized terms acronyms or whether we can use them comfortably

The second question is motivated by the fact that, in English at least, a sizeable proportion of the audiences of a technical text do not speak English as their first language and texts need to cater for their particular circumstances and abilities. It seems quite unnecessary to ask this question, but if we take this question and examine it in a more profound way, it can pay dividends.

Language combines various factors such as **culture, customs, norms, conventions** and countless other factors that make up a **language community**.

If we make the question even more specific and say which specific variety of language the audience speaks, this question might make more sense.

As useful as these questions are, they are still rather vague and prone to arbitrary results.

3) Asking the right questions

While we may never know exactly who will be reading our texts, we may be able to deduce who our audience is from the context or from the text type.

Rosenberg proposes a number of questions which can help us gain a clearer picture of our audience.

a) What is the general education level?

This will help us understand the general levels of literacy among the audience. For less literate audiences, a text which is written in overly complex language will be less effective, conversely using a language which is excessively simple might frustrate literate audiences.

b) What experience and expertise does the audience have?

This information will determine how much detail we can present in the text and how we present it.

c) How wide and diverse is the audience?

Should there be more than one audience the readerships will need to be categorized into primary and secondary audiences so that the appropriate level of attention can be paid to the needs, expectations and experiences of specific groups.

d) What is the native language?

Even if all of our readers speak English, there may be significant variation in their ability to speak it. This may be because it is not their first language. Readers may have only a very limited knowledge of a language as used in a specific subject area.

Strategies and solutions.

Limit the range of vocabulary used in texts and define new or specialized terms and abbreviations when they are first used in the text.

Use the active voice and avoid long sentences.

Similarly, there are numerous regional varieties of languages such as English, Arabic, Spanish and Portuguese, which means not all terminology will be standardized and not all cultural references will be commonly intelligible. So knowing the variety of a particular language and the intended country can have significant implications for the text and the people who will read it.

What is the native culture?

Culture may consist purely of a group of people with a shared interest in some particular area, for example, computer games, electronics or even crime. The nature of the cultural norms, expectations and dynamics within the target audience culture affects texts in a variety of ways, such as forms of address and cultural reference based on the assumption of shared knowledge. The native culture will also determine date and time conventions, currencies and references to laws and institutions.

To identify any differences and similarities between the source and target audience in terms of educational systems, learning style, political, religious and social climate, we can compare our source and target audiences in terms of their approaches to context, authority and uncertainty.

The notion of context provide us with a way of assessing how much detail there should be in a technical document in order for it to be understood by the intended audience. Context is the amount of explicit information we need to include so that the recipient can understand us.

A culture's attitudes to authority can affect how information is presented in technical documentation. It can help us to determine what is and is not an appropriate way of addressing readers or issuing instructions.

Knowing what you're talking about.

One of the most frequently asked questions among aspiring translators is how to gain specialism. Developing the subject-specific knowledge to allow you to deal with different texts and to develop a specialism is an ongoing challenge for translators. There is no easy way of solving this problem but there are some useful tips, which can help:

Read everything and anything: Regardless of whether you're interested in the topic or even whether you understand what you're reading , you will gain a familiarity with different writing styles and terminology.

Do your research: it is important to find out about a particular area as much as possible. The most valuable asset a translator can develop is the ability to research a topic quickly to find the most important information and then assimilate it.

Take a night course: not only are you learning useful skills, but you will also expand your knowledge in a specialized area. This is also a great opportunity to get out of the house and meet people.

Talk to experts: if you know someone who is an engineer or a nurse, for example, make use of their expertise. They can often answer questions more quickly than you can type a keyword into a search engine.

