STANDARDS AND DIFFICULTIES IN TECHNICAL TRANSLATION
A CASE STUDY ON THE USE OF TERMINOLOGY IN AUTOMOTIVE ENGINEERING

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Abstract: *This article offers an overview of the difficulties encountered in technical translation. It briefly covers the main aspects regarding technical terminology, such as the existence of different British and American terms designating the same concepts, the importance of translation accuracy in the case of parametric distinctions or SAE Standard for the assessment of translation in the field of automotive engineering.*

Keywords: *technical translation, terminology, translation standards.*

Technical discourse and technical translation

By specialized discourse we refer to "the specialized use of language in contexts which are typical of a specialized community stretching across the academic, the professional, the technical and the occupational areas of knowledge and practice" (Gotti, 2003:24). This perspective stresses both the type of user and domain of use as well as the special application of language in that setting.

As regards technical discourse, it is important to determine and clarify the meaning of the adjective "technical". Mention should be made that J. Byrne (2006:3)., unlike other LSP theorists, considers that "technical means precisely that, something to do with technology and technological texts. […] In discussing technical translation it is useful to make the distinction between specialized and technical translation. [….] Simply because a field or subject area has unique or specialized terminology[1] does not make it technical."

According to surveys, technical translation accounts for some 90% of the world's total translation output each year (Kingscott, 2002:247, apud Byrne, *ibid.*: 1). In spite of this impressive percentage, Byrne states that technical translation has not been favoured in the academic circles.

> Not particularly exciting or attractive and definitely lacking in the glamour and cachet of other types of translation, technical translation is often relegated to the bottom

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[1] The first meaning of the word terminology is "the set of special words belonging to a science, an art, an author, or a social entity," for example, the terminology of medicine or the terminology of computer specialists. The same term, in a more restrictive sense, means "the language discipline dedicated to the scientific study of the concepts and terms used in specialized languages." (Pavel and Nolet, 2001:XVII). A term or terminology unit in a specialized language is distinguished from a word in general language by its singlemeaning relationship with the specialized concept that it designates (called monosemy) and by the stability of the relationship between form and content in texts dealing with this concept (called lexicalization). The status of the term is revealed by its frequency of use and its relatively fixed contextual surroundings (its co-occurrents), and by typographical enhancements (italics, boldface print, quotation marks, etc.) (*ibid.*:19).

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division of translation activity and regarded as little more than an exercise in specialized terminology and subject knowledge. Indeed, these factors, particularly subject knowledge, have in some quarters led to technical translation being feared and loathed, like a modern-day barbarian of the linguistic world (*ibid*.)

The importance of terminology in technical translation

One of the most widely spread misconceptions about technical translation is the idea that technical translation is all about terminology. Newmark (1988, apud Byrne, *ibid*.:3) conducted a study which revealed that terminology accounts for just at most 5-10% of the total content of technical texts. Given the small percentage, the opinion that there is "a disproportionate amount of attention devoted to terminology and lexical issues in technical translation" is fully justified.

The idea was also brought forward by Bares (1972:129, apud Gotti, 2008:17) who considered that "differences between current English and technical English can be found at all linguistic levels and they manifest themselves in a different way, both qualitatively and quantitatively."

Engineering communication

In 1984, Hoffmann provided a list of the most important qualities that must be observed in specialized discourse: exactitude, simplicity and clarity; objectivity; abstractness; generalization; density of information; brevity of laconism; emotional neutrality; unambiguousness; impersonality; logical consistency; use of defined technical terms, symbols and figures (apud Gotti, *ibid*.: 29).

The same features must be applied in engineering communication. Engineering is a field that combines science, technology and mathematics to improve life in the natural world and consequently, engineering communication must be objective, clear and precise (cf. Irish and Weiss, 2009: 2)[1]. Furthermore, the implementation of engineering designs and solutions affects other sectors (business, government, the military and last but not not least, the general public), "therefore, precision or lack of ambiguity, is vital in both developing understanding and limiting liability" (*ibid.*:3).

Automotive engineering is a broad field (overlapping with many other industries, including construction, aerospace, and the military), defined as the activity of designing and constructing automobiles.[2][3] It focuses on land vehicles (cars, motorcycles, four wheelers, 18 wheelers, and even industrial equipment).

It originated as an extension of Mechanical Engineering and nowadays it employs many sophisticated electric and electronic devices (cf. Hann, 2004:109). The most important automotive fields are: design and development, manufacturing and production, quality and cost. The massive amount of translation in this field is the

[1][...] engineering communication represents a valuable alternative: by its nature and responsibility, it must be unambiguous and supported by evidence. In achieving these qualities, engineering communication becomes a model for writing and speaking in all fields.
[2] http://www.thefreedictionary.com/automotive+engineering
[3] cf. http://www.automotiveengineeringhq.com/what-is-automotive-engineering/

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response to the needs of an ever-growing industry. In 2013, in the UK it generated revenues of £60 billion.[1]

Terminology in automotive engineering

As regards the translation of texts belonging to the field of Automobile Technology, Hann considers that the difference resides in the fact that its basic concepts are likely to be at least familiar to even the most "non-technically minded linguists". He further claims that "not all translators would recognize a *capacitor*, when they see one, but most people would know what an *engine* or *gearbox* look like, and what they consist of. Automobile engineering is an area where translation difficulties lie more in L2 term selection than in fundamental conceptual complexities" (*ibid.*).

Automotive engineering is an area where the differences between British and American English cannot be ignored. Since the industries have grown up independently in the countries concerned, attempts to achieve conformity in the terminologies have repeatedly been frustrated.

Common concepts may be named differently by British and American automobile specialists. The terms designating these concepts may refer to the types of car/vehicle: *estate car/ station wagon, saloon/ sedan, 4x4/ sports utility vehicle (SUV), lorry/ truck*, car parts: *aerial/ antenna, wing/ fender, bonnet/ hood, boot/ trunk*, technical aspects such as *antifreeze/ defreezer, choke/ air strangler, indicator/ turn signal, alternator/ AC generator, gearbox/ transmission* or to motoring itself: *roundabout/ turn circle, layby/ rest area, traffic island/ channelizing island, crossing/ intersection* (*ibid.*:64-65). Spelling discrepancies such as *tyre/ tire, carburetor/ carburetor, aluminium/ aluminum, kerb weight/ curb weight* or *adaptor/ adapter*, are also common. Many of the concepts have become general everyday vocabulary, such as *engine/ motor, boot/ trunk, windscreen/ windshield*, or *silencer/ muffler*.

The testing procedures for automobile parts are of great importance and translation accuracy is crucial especially in those cases involving parametric distinctions: *power/ performance, torque/ moment, stress/ strain/ tension, impulse/ momentum, voltage/ tension/ emf*[2]*, resistivity/ resistance*, or *capacity/ capacitance*.

Capacitance, capacitor, capacity

> There are at least three different interpretations of *capacity* within the field, distinguished among other things, by their *typical units* (*tu*): *litre, microfarad, amp-hour (Ah)*. One interpretation is considered substandard by engineers outside the field. The preferred synonym (*ps*) is *capacitance*, a parameter related to two devices present in an ignition system, the capacitor and the condenser. The devices themselves are not radically different. One term is used in connection with electronic ignition systems, the other with conventional ones. (Hann, *op. cit.*:71)

Standards for technical translation providers (SAE J2450)

According to Pavel and Nolet (2001:XVII), the abilities necessary for a translator to do terminology work are: the ability to identify the terms that designate the concepts that belong to a subject field; the ability to confirm the usage of the terms in pertinent reference documents; the ability to describe concepts concisely; the ability to distinguish correct usage from improper usage; the ability to recommend or to discourage certain usages with a view to facilitating unambiguous communication.

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[1] https://www.gov.uk/government/publications/automotive-industry-in-the-uk-investment-opportunities/automotive-industry-in-the-uk-investment-opportunities

[2] electromotive force

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In connection with the above-mentioned abilities, Hann (*op. cit*.:73) draws attention to the fact that

> many of the younger generation of translators spend their lives glued to a monitor team, clicking L2 substitutions from electronic dictionaries directly into their translations almost without bothering to read them. Speed is essential; quality is neglected. The reader is free to use (or rather misuse) the e-book in the same way, but valuable information is lost, and with a little prior preparation, there is no need for this sacrifice.

Starting from the premise that a low-quality translation can lead to erosion of customer confidence, higher warranty costs or damage to vehicles or injury to people, the SAE (Society of Automotive Engineers)[1] Vehicle E/E Systems Diagnostic Standards Committee has also devised a numeric scale known as SAE J2450 (a Translation Quality Metric) for the assessment of translation in the field of automotive engineering. The scope of this standard is clearly stated at the beginning of the document: "This SAE Standard is applicable to translations of automotive service information into any target language. The metric may be applied regardless of the source language or the method of translation (i.e., human translation, computer assisted translation or machine translation)."[2]

The rationale behind this measure was the high degree of subjectivity regarding quality measurement in language translation for the automotive industry. [3]

The document was followed later the same year by the SAE J2450 Supplemental Training Document, "meant to provide both clients and translation suppliers with some suggestions for integrating SAE J2450 into their business practices. It is intended for the use of clients, trainers who wish to develop new evaluators, and those who wish to self-train."

SAE J2450 (issued in 2001 and revised in 2005) metric represents a weighted numeric scale that is used to measure the quality of automotive engineering translations. This metric contains four parts: seven primary error categories (wrong term, wrong meaning, omission, structure error, misspelling, punctuation error and miscellaneous error), two secondary subcategories (serious and minor), two meta rules[4] to guide the evaluator and the numeric weights. For a good evaluation every evaluator must be

[1] SAE International, initially established as the Society of Automotive Engineers, is a U.S.-based, globally active professional association and standards organization for engineering professionals in various industries. Principal emphasis is placed on transport industries such as automotive, aerospace, and commercial vehicles. SAE International coordinates the development of technical standards based on best practices identified and described by SAE committees and task forces. (https://en.wikipedia.org/wiki/SAE_International)

[2] http://standards.sae.org/j2450_200508/

[3] If an automotive company did set up a quality process with its translation suppliers, the quality of translated service information would generally be reviewed by in-country validators designated by the automotive company. Markups of the translated documents were provided back to the translation supplier for correction and editing. There would likely not be any standardized measurement metrics for determining or rating quality in a manner similar to methods used in the manufacturing side of the automotive business.

[4] 1. When an error is ambiguous, always choose the earliest primary category
2. When in doubt, always choose "serious" over "minor" (SAE J2450:4)

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familiar with the definitions of the seven error categories. Only linguistic errors are sanctioned, while stylistic errors are ignored.[1]

To locate a wrong term, an evaluator should first understand the concept of term. The term may be: a single word (*automotive*), a multi-word phrase used as a single, lexical constituent (*powertrain control module*), an abbreviation (*Hz*), an acronym (*ABS*), a number or numeral (*seven*) or a proper name, including trade or brand names, registered trademarks, place names or personal names (*Chrysler*).

The translator can make a syntactic error when s/he assigns a wrong part of speech as target language counterpart to the source term (e.g. when s/he cannot identify the correct part of speech). For instance, in the sentence "*The throttle valve connects to the accelerator pedal*" the translator could use in French the verb "connecter" that is transitive and should take a direct object, instead of a prepositional phrase complement: "*Le papillon de gaz connecte á la pédale d'accélération*" (cf. SAE J2450:6).

The terminologies of different automobile manufacturers operating in the same country or even in the same city can vary due to internal company policy or to minor technical differences in the vehicle themselves, which gives rise to trivial variations (e.g. *spark/ sparkling plug)* (cf. Hann, *op. cit.*:64-65).

e.g. electronic devices: *Electronic Stability Control (ESC),* also referred to *as electronic stability program (ESP)* or *dynamic stability control (DSC)*[2]**;** *Autonomous Cruise Control (ACC),* also called *adaptive cruise control* or *radar cruise control*[3]*; Power Steering,* also known as *power assisted steering (PAS)* or *steering assist system*[4]

car parts: *scissor doors*, also known as *beetle-wing doors*, *turtles*, *switchblade doors, Lamborghini doors* or *Lambo doors*[5]

This is not surpring at all, considering that specialized languages are a set of evolving social conventions. Consequently, it is difficult to achieve monosemy. Polysemy, as Gotti (2008: 40) claims "originates from the incomplete reorganisation of defining processes in each discipline and from the constantly evolving nature of

[1] Note that the current version of the metric does not measure errors in style, making it unsuitable for evaluations of material in which style is important (e.g., owner's manuals or marketing literature). The metric can be expanded to accommodate style and other requirements of particular new media.

[2] A computerized technology that improves the safety of a vehicle's stability by detecting and reducing loss of traction (skidding) (http://encyclopedia.thefreedictionary.com/Electronic+Stability+Program)

[3] An optional cruise control system for road vehicles that automatically adjusts the vehicle speed to maintain a safe distance from vehicles ahead.
(https://en.wikipedia.org/wiki/Autonomous_cruise_control_system)

[4] helps drivers steer by augmenting steering effort of the steering wheel.
(https://en.wikipedia.org/wiki/Power_steering)

[5] Automobile doors that rotate vertically at a fixed hinge at the front of the door, rather than outwardly as with a conventional door. Having used the exotic door style for several of its cars, Lamborghini has become synonymous with the implementation of scissor doors, which are sometimes colloquially referred to as "Lambo doors". (https://en.wikipedia.org/wiki/Scissor_doors)

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scientific knowledge, which is often so rapid that there is no time to develop new linguistic tools suited to the purpose; in such cases rather than create new items, existing lexemes are often assigned new meanings and functions." This is the reason why they include linguistic variants just as general language does (cf. Pavel and Nolet, 2001:28). But a wrong term in a translation can compromise the term glossary of a client or can denote a concept in the target language that is completely different from the concept indicated by the source language.

Guidelines for improving engineering communication and translation

For the engineering student it is not enough to master the general skills of communication (fluency in grammatical conventions; ability to organize sentences, paragraphs, and documents; and ability to speak clearly), but to be able to recognize and apply the particular features of the communication specific to his/ her discipline (Irish and Weiss, 2009: 3)

Irish and Weiss also offer a set of guidelines and strategies meant to improve engineering communication, especially written communication. These guidelines can and should be applied to all types of scientific and technical communication and are not useful only to engineers, but also to translators who sometimes have to restructure the poorly presented information.

Writing and speaking are integral and defining professional activities in both engineering and the humanities (Perelman, 1999:64). In spite of the fact that many researchers have grouped scientific and technical writing as a single entity, engineering texts do not belong to the former category, because engineering is not purely science. Engineering is not a derivative application of science, but a richly autonomous and creative discipline (cf. *ibid*.:66). Engineers produce artifacts, not abstract knowledge. Perelman's opinion is that engineering discourse is informed by the rhetoric of design, that is, the rhetoric of deliberation.[1]

Irish and Weiss's work includes the following guidelines:

I. Emphasize the action in the writing (1. identify the potential actions; 2. place real action into the main verb; 3. strengthen verbs by moving them up the scale where possible).[2]

II. In connection with the use of active or passive voice in engineering communication, the authors recommend the following:

1. When discussing matters intended to be objective, avoid using the first person but not the active voice (e.g. *the data demonstrate* or *figure one shows* and not *it is demonstrated by the data*).[3]

[1] According to classical theory, there are three main types of discourse: deliberative (concerned with decisions about policy and future action, that is with design), legal (issues of past fact, definition, and value, that is interpretation and judgment), and epideictic (concerned with the celebration or denigration, that is a current evaluation of a person or thing) (cf. Perelman, 1999:66).

[2] "The verb's position in the sentence has a significant impact on a reader's comprehension. Put the main verb as close to the start of the sentence as possible." (Irish and Weiss, 2009: 174)

[3] Avoiding the first person without using the passive voice requires the translator to find a real entity as the subject (*the data, figure 1* and not the vague pronoun *it*) (cf. Irish and Weiss, *ibid*.:180)

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2. When describing an act of judgement, use the first person and the active voice.

III. Find the real subject (1. identify false subjects; 2. uncover the real subject; 3. make the subject perform the key action).

We should also reduce the number of subjects, which will improve paragraph cohesion and align the subjects, as gathering together the points around the subjects can make the reader's task much easier.

IV. Capitalize on the power position (the sentence has two key positions: the start and the end, related to the grammatical core of any sentence: subject - verb – object). The end of the sentence should be the place for new information and complex ideas, which thus will have a greater impact.

e.g. *It is the purpose of this report to provide an analysis of the recent problem at ABC. This report analyzes the recent problem at ABC.* (Irish and Weiss, *op. cit.*:167-184)

Another important aspect that should be discussed is the appropriate sentence length, which can be determined using the so-called "terminal unit" (also called the "T-unit"). The concept was developed by Kellog W. Hunt in the early 1960s[1]. A sentence may contain more than one T-unit, linked together by some means (a conjunction or punctuation) or possibly separated by periods. Hunt even performed a study on different writers with different levels of skill, which confirmed that longer sentences are the attributes of those individuals with greater education (an average of 20.20 words per unit in the case of educated adults as opposed to 8.60 words per T-unit for the 4th grade education level).

However, the ideal solution for a technical writer or translator "is to move from blindly trying to sound more intelligent to balancing between short sentences for clarity of information and longer sentences for complexity of ideas" (*ibid.*:187).

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[1] A T-unit is defined as a complete thought, a grammatical measure, a complete main clause with all its modifiers and dependencies (apud Irish and Weiss, *ibid.*:187).

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