Five "translation" strategies to adapt technical content for lay audiences

Romina Marazzato Sparano
President
Plain Language International Inc.
Monterey, CA, USA

Correspondence to:

Romina Marazzato Sparano
romina@languagecompass.com

Abstract

Writing for lay audiences requires language that is understandable by readers without expertise in the subject matter at hand. This means carefully selecting, organising, wording, and supporting content, focusing on conveying relevant points in a straightforward and engaging manner. Applying the principles of plain language can help writers achieve these goals.

An important point is that plain language principles apply to all informative writing, whether readers possess specialist knowledge or not. Readers at all levels of expertise welcome and deserve clarity. The goal of this article is to present strategies for translating content originally created for specialists using the principles of plain language.

P lain language is defined as writing in which wording, structure, and design help intended readers find, understand, and use information. As such, it is not a specific way of wording, organising, or designing content. Rather, it is an approach to those processes aimed at conveying the message intended by the writer in a way that fits the needs of the target readers.

Brian Garner, former editor of Black's Law Dictionary, defines plain language as "the idiomatic and grammatical use of language that most effectively presents ideas to the reader."[1] Authors rely on grammar to convey meaning, because grammar provides the common ground necessary for weaving words together in a way that makes sense to readers of a language. Idiomaticity draws from stylistic and aesthetic preferences that help readers connect with content. Certainly, these are not new ideas: Quintilian, the father of modern schooling as far back as the 1st century of the common era, advocated for simplicity with style so that messages are conveyed with accuracy and elegance.

In June 2023, the International Organization for Standardization (ISO) published Standard 24495-1:2023 Plain language – Part 1: Governing principles and guidelines.[2] This standard has generated a lot of interest and discussion about how the outlined principles are to be implemented. As a brief disclosure, I am part of ISO Technical Committee 37 developing language and terminology standards, as a member of the mirror committee in the US for the American National Standards Institute (ANSI). Yet the ideas presented here emerge from my professional practice and differ only slightly from what is presented in the standard. In particular, I use five dimensions for intervention, which I call RAISE for relevance, accessibility, intelligibility, suitability, and efficacy.

I unpack the principle called "understandable" in the standard into intelligibility and suitability (so called in part to fit into the RAISE acronym). These two principles cover two related, but distinct, linguistic aspects technically known as textuality and adequacy. The challenges of creating and maintaining the logical flow of text differ from the challenges of choosing terms and wording that fit an audience's stylistic preferences. Of course, despite being described separately, clear writing principles are not applied sequentially or independently during the writing process but rather guide intertwined decisions during the planning, drafting, and revising of text. Let's now briefly review the principles.

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RAISE principles

Plain language requires interventions in wording, structure and design to respond to the needs of the readers and the goals of the communication. To address interventions, I developed the RAISE rubric covering 5 dimensions: relevance, accessibility, intelligibility, suitability, and efficacy. While interventions in these dimensions are presented sequentially, in reality, they overlap to create an integrated whole.

Relevance of content to the intended purpose includes the selection of topics and objectives, their explicitness in the text, and the perspective and depth with which those topics are addressed. To make these decisions, the writer can rely not only on the judgment of experts (including their own) and review existing literature on the characteristics of the readers but also invite readers into the process through interviews, surveys, and sampling. Collaborative development is referred to as co-design and requires negotiation and compromise that often leads to innovative solutions.

For example, as part of the Rapid Acceleration of Diagnostics (RADx*) initiative in response to the COVID-19 pandemic, the National Institutes of Health (NIH) fostered accessibility of COVID-19 home tests by engaging various stakeholders in a collaborative project. The process included:

- Input and feedback from advocacy groups like the Alliance on Ageing and Vision Loss, the American Council of the Blind, and the World Institute on Disability
- Usability and accessibility consulting by subject matter experts
- Insight from government agencies
- User testing by Georgia Tech HomeLab.

The learnings from this initiative have been captured in a best practices document (U.S. Access Board, 2023)[3] that covers guidelines for the five principles at hand.

Accessibility of content involves where the content is published, the rhetorical structure of the message, and the physical design of the document – including the use of non-textual elements, such as images, graphics, or videos, that help capture and maintain the reader's attention, as well as process textual information. The term accessibility employed here intersects with but goes beyond digital accessibility, which focuses on access to materials and computer platforms for people with disabilities. Note that digital accessibility strategies can be used on a text that is not clearly written. (The guidelines for digital accessibility are outlined by the World Wide Web Consortium, in the Web Content Accessibility Guidelines Initiative.)

Intelligibility primarily involves textuality. Textuality, so called by linguists, is the construction of meaning attending to the grammaticality, acceptability, cohesion, and coherence. It certainly also includes adequacy – adapting the form of expression to the reader and the context to communicate with empathy – but, as mentioned, this dimension deserves independent consideration.

To achieve textuality, that is, to construct meaning, a writer uses vocabulary, grammatical constructions, and argument organisation that best suit the message. For example, to explain a process, its stages must be presented in a logical progression that leads to the expected result. If a step is out of order, the writer revises the text before publishing. This contrasts with speech, where speakers can engage in a real-time revision process, adding, clarifying, and restating on the go.

Suitability involves the adequacy of the text in terms of adapting style and register to the target audience for the text. It includes positioning the text in its cultural environment, especially as part of a socially consensual genre. The writer must adapt the content not only in terms of the selection of topics, the depth of their treatment, and the intelligibility of their wording, but also in terms of the register and style to support communication with the intended reader. Note that we understand by register the interpersonal aspect of the text as defined by Eggins.[4] Empathy plays a very important role in effective communication; for example, in healthcare, empathy improves diagnosis by fostering exchange between a professional and a patient, encourages evidence-based decision-making, and promotes adherence to treatment. This concept has been formalised in the style guidelines on respect and objectivity of the American Psychological Association (APA)[5] primarily directed at research but useful elsewhere – especially in the case of descriptors of individuals and groups.

Efficacy of the text concerning the intended use involves evaluating the document throughout its life cycle using appropriate methods for each stage, such as literature review on the audience, interviews and surveys, A/B tests, performance surveys, etc. While traditionally this has been a *post facto* task, adopting a co-design approach brings together professional expertise and insights from readers throughout the development process to help enhance the readability, understandability, and applicability of texts.

Taking into account these five dimensions, five key translation strategies to adapt content for lay audiences are discussed below.

1. Use a stepwise process

Translating technical text into text for lay audiences is more than substituting lay explanations for technical terms. In fact, it often requires a stepwise process to first ensure that RAISE principles are implemented in the technical version. Once we have a clear technical version, then we can adapt the document to readers who are not specialised in the subject matter.

In Figure 1, the bottom left corner shows an original technical text that includes redundancies and a complex message structure, presenting first the aetiology and then the symptomatology of the disease. If we use this text as the basis of our lay version, moving along the horizontal axis and

changing only the technical terminology, we do not address those issues, and may possibly introduce new ones (such as the reference chain mismatch *migraines/its*). If, instead, we streamline the technical version along the clarity axis, we can pinpoint the two main concepts easily, reorganise them to suit the needs and expectations of lay readers (more familiar with symptoms than causes of disease), and provide an easy-to-follow list for the symptoms, along with explaining the technical terms.
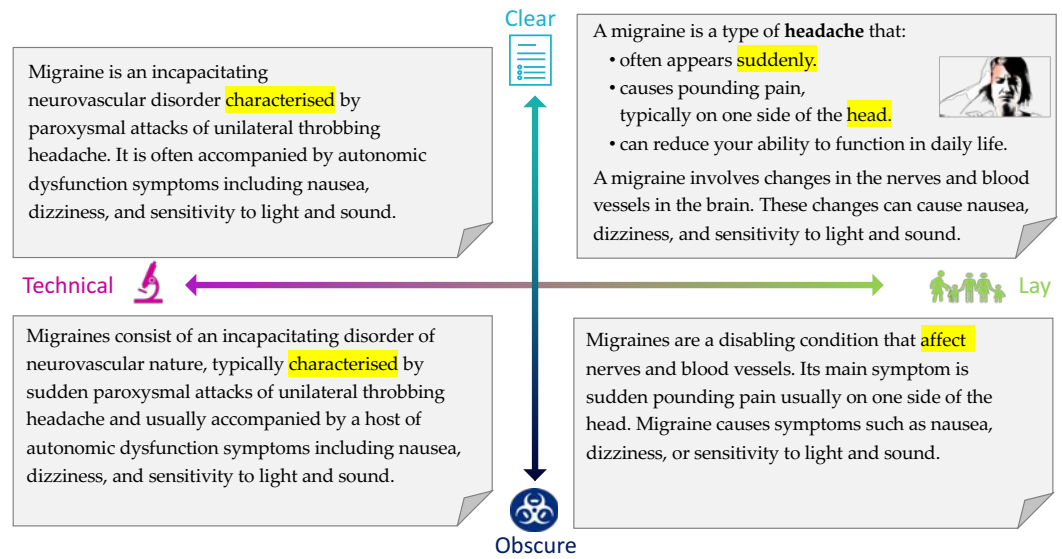
2. Always mind the basics

When translating technical text into lay text, we must not forget to review the lay version to make sure the basics are right. Common issues to check for include:

- subject–verb agreement errors
- ambiguous or mistaken reference chains
- wrong or misleading punctuation
- lack of parallel structures
- unclear centre embedding
- confusing noun piling

These issues can make parsing for meaning harder or require undue inference on the part of the reader. Some emerge from cut-and-paste style editing as we adapt technical language to lay

Clear

Migraine is an incapacitating neurovascular disorder characterised by paroxysmal attacks of unilateral throbbing headache. It is often accompanied by autonomic dysfunction symptoms including nausea, dizziness, and sensitivity to light and sound.

A migraine is a type of **headache** that:
- often appears suddenly.
- causes pounding pain, typically on one side of the head.
- can reduce your ability to function in daily life.

A migraine involves changes in the nerves and blood vessels in the brain. These changes can cause nausea, dizziness, and sensitivity to light and sound.

Technical — **Lay**

Migraines consist of an incapacitating disorder of neurovascular nature, typically characterised by sudden paroxysmal attacks of unilateral throbbing headache and usually accompanied by a host of autonomic dysfunction symptoms including nausea, dizziness, and sensitivity to light and sound.

Migraines are a disabling condition that affect nerves and blood vessels. Its main symptom is sudden pounding pain usually on one side of the head. Migraine causes symptoms such as nausea, dizziness, or sensitivity to light and sound.

Obscure

Figure 1. Using a stepwise process along 2 axes
Image by Romina Marazzato Sparano

language. For example, incongruous verb agreement and a mistaken comma after the subject tend to linger after removing intervening information between subject and verb. Deviating from using parallel structure for parallel ideas or presenting ambiguous reference chains often emerge from editing or translating phrases within a larger structure. (See Figure 2 as a humorous example of such ambiguity.)

Let's look at some examples:

- **Few are the teachers who, at the age of five, can teach children to read.**
  The prepositional phrase "at the age of five" does not refer to the age of the teachers, the preceding noun, but to the age of the children, a noun presented after the phrase. To avoid ambiguity, the phrase can be moved to the end of the sentence, closer to the intended antecedent, rather than relying on the reader to intuitively resolve the ambiguity.

- **The new data convinced her students have the maturity to talk about difficult subjects.**
  Here "her students" is read as a unit first, because it appears to follow a frequent noun phrase structure. The reader has to then walk back this interpretation after encountering a verb that signals the necessary separation between "her" and "students" as belonging to two sentence elements: a direct object and a complement. Using the complementiser "that", often omitted in speech, where intonation signals separate elements, can introduce the complement clause, and resolve the ambiguity.

Guilt and bitterness can be destructive to you and your children. You must get rid of them. these feelings.

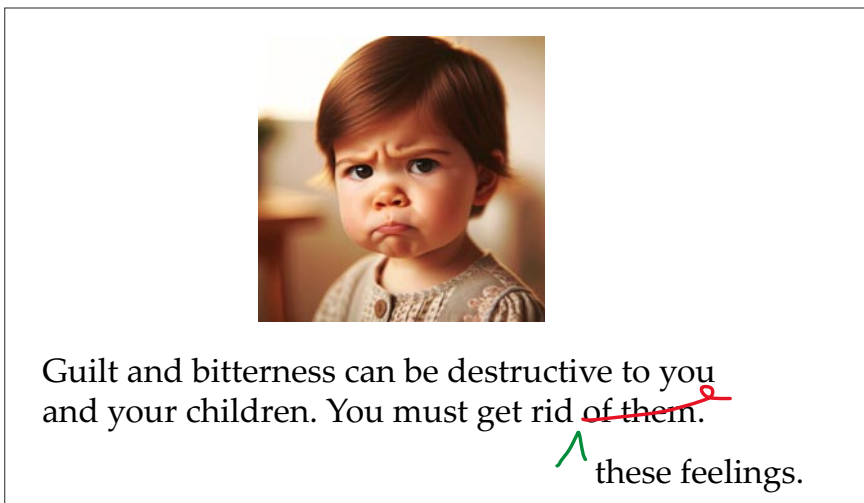*Figure 2. Example of editing an ambiguous and potentially dangerous text fragment*
Image by: Romina Marazzato Sparano with OpenAI's DALL-E model

It is extremely difficult, if not impossible, to unpack all the knowledge and know-how embedded in technical terms.

3. Create project–specific glossaries

Among specialists, technical terminology serves as shortcuts carefully crafted to house layers of meaning that include both knowledge and know-how. Explaining such terms to lay audiences requires selecting and focusing on particular layers. It is extremely difficult, if not impossible, to unpack all the knowledge and know-how embedded in technical terms. The difficulty is in part formal: it would require overly lengthy rendition to spell out the meaning layered within terms. But, more importantly, it may require an educational journey beyond the scope of the document or content you are trying to share.

Glossaries must thus be project-specific to focus on the layers of meaning relevant to the communication purpose at hand. For instance, the term "cancer" may be adequately defined in a brochure that lists reasons for swollen lymph nodes as "a disease in which some of the body's cells grow uncontrollably". However, it may require a different definition in the context of distinguishing specific types of cancer, their symptoms, diagnosis, and prognosis.

Consider the following example of injection types. Intravenous, intramuscular, and subcutaneous are terms used to describe different methods of administering medication or substances into the body. Each method targets a different layer of the body's tissue. For a general description, you may choose to create the following glossary:

Technical term	Lay Explanation
Intravenous	Injected into a vein
Intramuscular	Injected into a muscle
Subcutaneous	Injected into the skin

However, if the term "intradermal" is included in a different project, you will need to modify your glossary. For example, you may choose to use the following:

Technical term	Lay Explanation
Intravenous	Injected into a vein
Intramuscular	Injected into a muscle
Intradermal	Injected into the surface layer of the skin
Subcutaneous	Injected into the fatty layer under the skin

Another example of glossary terms needing adapted explanations for different projects is arrhythmia. For one project, it was simply defined as *"irregular heartbeat"*. But the term required further details in a project about tachycardias. The lay explanation for arrythmia now had to include reference to a group of heart rate disorders in which the heart can beat too fast (tachycardia), too slow (bradycardia), or irregularly.

Existing glossaries are certainly a tool that may help you develop your own glossary. But we should not rely on existing glossaries without careful scrutiny to understand the purposes and needs they served. An existing glossary may be used as a basis to expand on. For example, expansion in the glossary about injection types may include a description of use and goals of each type of injection, such as delivering a substance directly into the bloodstream for quick action versus an administration aimed at a slower and more consistent absorption of medication. Consider, also, the possibility that an existing glossary may not serve your message purpose or your readers' needs, and that it may be easier to compile your glossary from scratch.

4. Use relevant storytelling and imagery

The use of storytelling and imagery in explaining technical concepts to lay readers can be a powerful tool for transforming complex ideas into engaging and understandable narratives. Storytelling engages empathy when processing information, so embedding a technical concept in a story can make it more relatable and easier to grasp. However, careful consideration of drawing on emotion is needed. While emotion can assist reasoning[6] – especially when risk and conflict in personal or social matters are involved – it can also "bias evaluative judgments of unrelated events or topics".[7]

Stories can embody abstract concepts through characters, plots, and settings that readers can visualise and connect with, facilitating a deeper and more intuitive understanding. Imagery can be used independently or as support for storytelling. Analogies and metaphors can draw parallels between complex concepts and items familiar to the audience, simplifying the understanding by linking the unknown to the known.

Visual illustrations that also apply plain language principles can distill complex information making it more accessible. Well-crafted images, diagrams, or infographics must include only the relevant aspects of the concept, avoid decorative elements, use meaningful colour and contrast as well as parallel structure, for instance. For example, when explaining a complicated process like venous and arterial blood flow, an annotated diagram can convey the sequence of events and interactions more effectively than text alone. This visual representation acts as a cognitive shortcut, allowing readers to grasp the essence of the concept quickly.

Combining imagery with storytelling not only breaks down barriers to comprehension but also makes the learning process more engaging and memorable, catering to the varied ways in which people access and process information.

An example of analogy in my practice includes explaining how an MRI machine works. MRI stands for Magnetic Resonance Imaging and refers to a medical imaging technique used to visualise internal structures of the body in detail. Explaining how the visualisation happens can be a daunting task. However, we focused on the distinction from invasive diagnostic techniques – which was the main issue for the patients we were trying to reach. We set out to explain the non-invasive nature with the following analogy.

Figure 3. Using analogy and metaphor can help convey a message in terms of objects and processes familiar to your lay readers.

Images by: left, Romina Marazzato Sparano with OpenAI's DALL-E model, right, MRI from cdimiami[8]

The MRI machine is like a magnetic pin cushion and hydrogen protons in the body are like pins. Hydrogen protons, like pins in a sewing project, are abundant and easy to detect with a magnet. Hydrogen protons make up the water and fat tissues of the body. The magnet in the MRI can tell apart the hydrogen proton "pins" from all the other materials in the body. The magnet momentarily aligns the protons of body tissues as if aligning pin heads and tips to take a neat picture. After the MRI is turned off, hydrogen protons return to their natural orientation without affecting the person, just like pins can be dropped back into their box after being picked up by a magnetic pin cushion (Figure 3).

This image represents the analogy of an MRI machine as similar to a magnetic pin cushion to align hydrogen protons "pins" in order to capture an image of the heart.

5. Consider second-language readers in your grammar

English is, for reasons we will not get into here, the *lingua franca* adopted as a common language between speakers of diverse languages and cultures. As such, it may be better suited to speakers of some languages than others because of lexicon, grammar, or common cultural norms. Some idiosyncratic aspects of English to consider include its use of phrasal verbs, its motion event typology, the resultative construction, and the use of idiomatic expressions.

Phrasal verbs are combinations of verbs and prepositions or adverbs, which can have meanings that are not always predictable from the individual words. For example, "give up," meaning to quit or stop trying, does not directly relate to the meanings of "give" and "up."

Event typology[9] refers to how a language expresses motion in terms of manner and direction or result. English is a *satellite frame* language that also incorporates *verb-frame* constructions due to its rich linguistic history. Verb-frame constructions, inherited from French, involve verbs that express the direction or result of action with manner being an optional element expressed in adjuncts (as in "She entered the meeting [surreptitiously]"). They are characteristic of Romance languages and typically considered higher register in English. Satellite-frame constructions involve verbs that express the manner of action with the direction or result expressed through mandatory particles or prepositions (as in "She snuck into the meeting"). They are characteristic of Germanic languages and the preferred construction in everyday English. The coexistence of these two types of constructions allows for nuanced expression and flexibility. This can help you adapt how you phrase manner and result in verb phrases when writing for second language readers.

The prevalence of satellite-frame constructions in English has an impact on what's called *resultative constructions*. Resultative constructions express an action in terms of the outcome or result they produce using a complement (a mandatory element in the predicate that qualifies the subject or the object), as in "He wiped the counter clean." Many languages cannot create such phrases because manner verbs cannot

be combined with a complement conveying result. Consider whether your focus is the manner or the result in conveying your message to non-native readers and use the verbs accordingly. If necessary, express the other aspect (result or manner) using an adjunct or an additional phrase.

Last, but certainly not least, we must consider idiomatic expressions, cultural references, and cultural context-dependent meanings. Understanding the figurative meanings of idiomatic expressions can be challenging. If an idiom or culture-related image is essential to your message, consider explaining it or rephrasing it in a literal way. This can help readers understand the intended meaning without relying on the cultural context of the idiom.

You can, however, use idiomatic expressions and cultural references to your advantage. As part of a campaign to educate different parts of a community (men, women, youth, etc.) about heart disease, a team of colleagues used American football, soccer, knitting, and using apps for custom versions of the same basic message.

Lay language as a democratising tool

The benefits of translating technical content for lay audiences include saving time and effort in understanding and thus support learning, decision-making, and inclusivity. In addition, adapting technical content for lay readers aids in knowledge dissemination, allowing important findings or information to reach a broader audience. This aspect is key for bringing knowledge to the general public, educators, policymakers, and specialists outside the field. Consider that a jury of peers is increasingly called upon for the task of weighing highly technical evidence such as chemical, financial, forensic, and AI-related. Also, a significant portion of legislation includes technical content that lawmakers need to understand and evaluate. Lastly, lay versions of specialised content can make complex academic research more accessible to researchers in related fields who might not have encountered, understood, or paid attention to the paper in its original, more specialised publication.

Translating technical text into lay language is key to democratising access to knowledge, promoting a wider understanding of complex aspects of our modern world, and fostering an inclusive environment where information is accessible to all. Applying the strategies listed above, among others, will help you tackle technical concepts, promote engagement with your material, and facilitate decision-making.

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Author information

Romina Marazzato Sparano is an expert in medical localisation and health literacy working at Plain Language International Inc. (Plainlii) and Plain Language Academies. She provides training and consulting. Her mission is to improve access and understanding of written information to better outcomes for individuals, communities, and the environment. Romina pursues research at the University at Buffalo and is the founder of Lathice (pronounced "lattice") – a non-profit dedicated to health literacy. She is a contributor to language standards at the International Organization for Standardisation (ISO) and ASTM International, is a judge for ClearMarkAwards by the Center for Plain Language (North America) and the Plain English Awards by the WriteMark Trust (Australia and New Zealand), and is actively involved with professional organisations including the American Translators Association (ATA) and Plain Language Association International (PLAIN).