CHAPTER 2

Clear Communication Guidelines

You've probably taken many writing classes during your education, all of which have been about "Teaching you to write." That's not this chapter. We assume you can write—that you can construct coherent sentences in English.

This chapter is about written communication for business. This chapter explores a different way of constructing information. Adapting to this new approach may be challenging, at first. That's OK. Most engineers eventually prefer writing this way, as it's clearer and more straightforward.

"Oh," you may think, "I'm an engineer. I don't need to worry about communicating because the genius of my engineering will be obvious to all." And you would be wrong. You must be capable of communicating with many people in the business world. You want your genius ideas to be understood. You can't hope people in the business world will figure it out themselves.

Academic writing is not appropriate in the business world. In academic writing, it can seem you're encouraged to write very long sentences, with lots of words and many commas, and to just keep rambling on. It can take pages to get to a point and if the point is vague and unclear, well, that's all the better. You may feel like you got As in school for just this sort of writing.

Academic writing demonstrates you understand the information your teachers have tried to teach you. You're demonstrating your knowledge and comprehension of the material covered in the class. Your instructor is looking for your mastery of the information and assigns you a grade based on how well you demonstrated that understanding.

This type of writing isn't suited for the business world. In the business world, they assume you have the depth of knowledge because they hired you. They don't want you to demonstrate that you know the field so you can get a good grade. They need you to understand business issues and concerns, so business decisions can be made based on the information you present.

In the business world, everyone is busy. No one has time to parse complicated and confusing communication. If it's not clear, the communication is returned to you for clarification (at best) or thrown out and ignored (at worst). Either way, your message is unclear, and it's your fault the noise in your communication overwhelmed the signal—which means it's your problem to solve. You need to engineer your words using the same care you craft your code or develop your devices.

Clear communication matters in the business world

In the business world, you need to communicate because that's how the business world works—people communicate with each other. Your boss wants to know what you worked on last week, co-engineers want to know if your work is ready to be integrated into their work, you want HR to grant you a vacation, and so on.

Sometimes this communication happens with people just talking to each other, but asynchronous methods like writing support most communication in the business world. You write a weekly report to your boss, you contribute to the spec for the new products you're working on, you want to go on vacation next month, you write a message to a customer in Slack. It's obvious that a company with more than two employees can't function effectively if nothing gets written down.

And that's where clear written communication comes in. If you write it down but don't communicate it clearly, you waste time and no one understands what you're trying to communicate. If no one understands what you're communicating, you won't be at that job very long. If you want to run your own company, no one will understand what you're trying to do. No one will give you funding or buy your product.

Even if you are communicating with other engineers, you need clear communication. Think of the confusion that sometimes happens when you're talking to engineers in your engineering specialty. In the business world, you're working on teams of engineers from other engineering fields, educated in other countries, with different engineering knowledge and expectations. Something as simple as the units of measurement can be an issue.

If you think that can't possibly happen, NASA crashed a Mars Orbiter into the planet. After reviewing what happened, NASA determined one team was using English/Imperial units of measure while other teams were using metric. When the orbiter adjusted its orbit, the different systems moved the orbiter too close to Mars, where it couldn't function properly in the atmosphere. It most likely was damaged and skipped off the atmosphere towards the sun. 273 travel days and $125 million dollars were wasted, largely because the engineers on the teams did not communicate what they thought was "obvious."[1]

[1] "Metric mishap caused loss of NASA orbiter" (Lloyd 1999)

The basics

This section starts with the basics to refresh your memory. In no way should you think of this as a comprehensive overview of constructing sentences in English or a substitute for intensive English training. If you're uncertain of your ability to write in English (perhaps you're still learning English), you should seek a class or group to support you.

There are exceptions to almost everything in this discussion, but we're simplifying for our purposes. If we start simple, we can build to more complex.

What's in a sentence?

A sentence is the smallest piece of communication we're going to look at. As you recall from grade school, a sentence consists of a subject, a verb, and then some other stuff.

The subject is the actor of the sentence. The subject is the *who* or the *what* that's doing the thing the sentence is about. For example, our subject is **Bob**. The verb is the action the subject does. For example, our verb is **runs**. The other stuff is in the predicate—everything after the verb. For our example, let's have a prepositional phrase: **to the car**.

This gives us a simple sentence: **Bob runs to the car**.

Technically, we could stop the sentence after the verb: **Bob runs.** In English, we don't need anything else. But most sentences are not two words. Most sentences have quite a bit of information in the predicate.

Research shows that the *subject + verb + predicate* structure is the easiest structure to understand in English. It may also be the easiest in other languages that use this construction. The Plain Language initiatives many governments have adopted suggest this structure as the easiest to help people understand communication.[2]

Active voice

In technical communication, which is the sort of communication you're doing as an engineer, the most important "voice" is *active voice*. Active voice depends on the subject of the sentence, the actor, to do the action, so the actor should come first in the sentence. An example is: **The writers won the award.**

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[2] See https://plainlanguage.gov for information on the US government plain language initiative.

Passive voice hides the actor of the sentence and makes it hard to understand who is doing what. Academic writing often teaches passive voice as a way to remove the author from the writing. Unfortunately, this is not good writing in the business world—we need to know who is doing what. An example of passive voice is: **The award was won by the writers.**

Worse, passive voice makes your reader pause and turn the sentence around in their mind to figure it out. It's not conscious, but this pause impacts comprehension and readability. That's not a big deal if your reader must do it one time in your 20-page document—however, it's a giant deal if your reader has to do it for every sentence. Your co-workers are not going to work that hard to understand what you're trying to say.

Always write in active voice. If this is hard for you, practice starting all your sentences with "You can…" (You can print the document). It's almost impossible to write a passive voice sentence when you front-load the sentence with the actor. Later, as you get better at this, you can start sentences using the imperative (Print the document) and other ways.

The only typical exception is if you're writing customer-facing error messages for products. In this case, write in passive voice because if you put the actor at the front of the sentence, you're probably blaming the user for the problem. And while your user may have caused the problem by pressing the wrong button, nothing is helped by implying they are stupid or incompetent.

For example:

You pressed the wrong key. (active voice but a little blame-y)

The wrong key was pressed. (passive voice but not blaming)

You see how, although the active voice is clearer about who did what, it blames the customer for what's happened. In this case, it's better to make it less clear about who did it and focus on what happened. Even better is to provide a solution to what happened.

Present tense

Tense is how we use language to express when something happened. English has 7 or 8 tenses; opinions vary, it seems. Other languages have more tenses or fewer tenses or no tenses. It's the nature of languages.

In technical communication, we care most about the present tense. Present tense puts the action in the now, making the information immediate and relevant. We use the simple past or future tense only when the action really happens then.

For example:

- **Present tense:** Bob runs to the car.
- **Past tense:** Bob ran to the car.
- **Future tense:** Bob will run to the car.

Notice how present tense makes you feel like Bob is running right now? You can almost picture it in your mind. What's going to happen when he gets there? Why is he running? It's inherently interesting because it's happening right now.

In the past tense, Bob may have run yesterday, last week, or several years ago. We don't know. We assume things worked out in some way because we didn't hear anything about it when it happened. It's already over. We're not that interested in it.

In the future tense, we don't know when Bob is going to make that famous run. Is it now? In a few minutes? Perhaps later? Do I have time for a nap? I have things to do. Could someone maybe call me just before Bob runs? It's not that interesting for us to think about because there is no immediacy about the event. We have time; it's later, not now.

The future tense implies that you have no idea when something is going to happen. You're adding ambiguity to the timing of the event. For example, if you're writing about a product, you might write something like: "The report will print." You're saying that the report will print eventually (who really can know when). Perhaps today, maybe tomorrow. It's just hard to know. Call us if it works for you—we're still waiting.

You don't want people to feel uncertain about your products. you want them to be certain that they know how your products work.

For example, if you use future tense in a functional specification that defines how a report gets generated, you have left wiggle room such that your report could print overnight or next week, even if you (or, more to the point, your customers) want the report to print immediately. We do not use this example randomly, as we have seen much upset in projects over this sort of miscommunication. Using present tense and specifying the time period within which you expect the report to print avoids this miscommunication.

Second person

English has several pronouns: he, she, it, they, we, I, and you. In technical communication, you almost always want to speak directly to the person you are writing to, so we use *you*. It would be odd to speak directly to a friend and use another pronoun or, worse, "the user." You can imagine asking that attractive person out for coffee and referring to him/her as "the user"—"Would the user like to go out for coffee?" That's not going to result in a nice chat, and it might get you reported to someone (or blocked) as just strange.

The same goes for your technical communication. You're writing to a specific person or people; consumers of your document or the engineers building the product. Because you're talking directly to someone, use *you* when you need to refer to them.

That said, sometimes, you do need to refer to "the user" when there is another group of people who are not the people you're attempting to write directly to. For example, if you're writing a specification for a systems administration product, there are two layers of users—the *sys admins* (your audience) and their *users*. Some people are, in fact, users of that product—the people who need the sys admin to create accounts and set up permissions. In this case, you do refer to them as "the user" because they are *your readers'* users.

Lastly, in English, "you" is more familiar and more trusted at an unconscious level. If you're writing in other languages, the familiar "you" may not be appropriate. For example, in Spanish, the familiar you (*tú*) is generally reserved for family and close friends. Using it in technical communication where your audience is strangers is presumptuous. And other languages have different versions of *you* that make it all more complicated.

Repetition

If you call something a widget in your first paragraph, use that word for that thing all the time. In academic writing, you were taught that using the same word over and over is redundant and potentially boring. And when you're writing to demonstrate your mastery of language and the topic, this may be true. It's certainly not true in technical documents.

Repetition is clarity. It reduces confusion because everyone knows exactly what you're talking about every time you talk about it. No one gets confused because here you called it a widget, and there you called it a banana, and later you call it a cat. You do not bore your readers with repetition—consistency helps ensure you're communicating clearly.

Reduce the reading level

The average reading level in the US is 5th to 7th grade. And while you may be writing for other engineers, your communication is not the only thing vying for their attention. The simpler the words you use, even when you're communicating complex technical information, the easier it is for your audience to understand and remember. Especially if, as is often the case, your fellow engineers are not native English readers. In no way are we saying you should talk down to your audience; we're saying meet your audience where they are and get your message through.

Think of it like a radio frequency (say, AM vs. FM): if the receiving radio cannot accept FM, are you "dumbing down" the signal if you adjust it to AM? Of course not. You're just changing the frequency to ensure the signal gets through.

Here are two simple ways to reduce the reading level:

- Keep three- (or more)-syllable words to a minimum. Where possible, except for appropriate technical terms, use smaller words.
- Avoid what linguists call *latinates*. These words—like utilize (use), facilitate (help), and so on—may make you feel like your writing is more formal or more intelligent, but they can be confusing.

User-focused, user-centric

Because we write to people, we need to keep the focus on the reader. That sounds obvious, but it gets forgotten. Business readers need to know why they should care about this information you're communicating.

Business readers have a lot vying for their attention, so it's up to you, the communicator, to show your readers why they should care. And you need to show them why in the first few sentences. You cannot expect people to read your communication because they are desperate for any word from you.

You must always think first about your readers when you write—what do they care about? How can you talk about your subject so that you're engaging them? The writing guidelines so far help a lot. But so too does talking about products from the reader's point of view—not the product's.

For example:

Product-centric: The WidgetProduct uses tags to talk to other products.

or

User-centric: You can use tags to let the WidgetProduct talk to other products.

The first example is written from the point of view of the product. It tells us something that the product does but doesn't tell us why we should care. Oh, we think it's nice that WidgetProduct uses tags to talk to other products. It should probably continue to do that. But, as written, it seems not to need you to do that. The information is presented as a factoid, but you're not told why you should care or why this information is important to you.

The second example uses the writing guidelines (active voice, second person, starting the sentence with "You can…") to connect the reader directly to what the WidgetProduct can do. The reader is involved because you start the sentence by involving them. You tell them what they can do in the product. It's not a factoid hanging in space; it's an action they can take to expand the product and what it does. There is a specific problem your reader may have, and you show how the product solves that problem or takes a step towards solving that problem.

Short is good

Business people are busy. They have meetings, deadlines, and projects to attend to. Their minds are constantly trying to process multiple things at one time. The term *cognitive load* refers to how much of their brain's capacity is occupied at any given moment. Too much cognitive load means that your reader is mentally overwhelmed with information from the world while trying to read your content.

Think of it this way—reading a complicated book in a quiet house on a relaxing weekend vs. reading the same book sitting in the middle of Grand Central Station at rush hour. Which situation makes it harder to understand and remember the content in the book? Grand Central Station is likely to be harder because there is more going on there, making it harder to focus because so much of the mental capacity is already in use. That stuff going on is cognitive load.

We can't control if or when our readers are struggling under a significant cognitive load but we can do things to avoid increasing it. In addition to following the guidelines above, the next thing we can do is keep our information short.

Short sentences

Keep your sentences to 25 words or fewer. Research shows about 20 words is a good limit.[3] Short sentences are easier to understand because there are fewer ideas to consume at one time. The fewer ideas you pack into a sentence the easier it is for your reader to understand the ideas.

You don't have unlimited room to explain your ideas. Limit the words in your sentences. Make every word count. Remove extra words and phrases to make room for words and phrases that are needed for your idea.

You may think this sentence-length limit is impractical, that no one can write about complicated technical issues and keep their sentences under 25 words. You'd be wrong. Take a look at any example of technical information that you can easily understand without having to re-read it several times. You will find that it probably follows this guideline.

Short sentences also prevent you from adding unnecessary words. When you have 20 or so words in every sentence, every word must contribute to the signal. Additionally, short sentences lend themselves to the subject + verb + predicate construction that helps people understand and remember content.

What words can you cut or change? Start with the list in Table 2.1. It's not comprehensive, but removing these phrases from your writing can go a long way.

Table 2.1 – Phrases to cut from your writing

Not this…	Try this…
are used to <verb>	<verb>
has been	is
has been <verb>	<verb present tense>
has finished	is done *or* is complete
has the option of	can
have finished	are done

[3] "Sentence length: why 25 words is our limit" (Vincent 2014)

Not this…	Try this…
have the ability to <verb>	can <verb>
have the option to	can
if you want to <verb>	to <verb>
in order to	to
is able to	can
is designed to <verb>	<verb>
offers the ability to <verb>	lets you <verb>
once	one time *or* after
since	because *or* after
will also be able to	can also
will be <verb>	is *or* are <verb>
will be <verb>	<verb present tense>
will be able to <verb>	<verb>
will have been	is *or* are
will have the ability to <verb>	can <verb>
will have to	must
will have to be	must be
will then be	are *or* is
without the need to access	without accessing
would be	are *or* is
would like	want

Short paragraphs

As you know, paragraphs are groups of related sentences. Readers comprehend best with about 3 to 5 sentences in a paragraph. That means you have about 125 words before you need to change the topic slightly. If you look at your paragraphs, you will probably see you are already doing this. At about the fifth sentence, most people slightly change the topic. That paragraph break helps people know when the subject is going to change and gives their brains a rest.

Short sections

Sections are groups of related paragraphs. Readers want no more than five paragraphs before they see a section heading. A section heading is a title set on its own line and distinguished visually from the main paragraphs. You can see examples throughout this book, including the **Short paragraphs** and **Short sections** headings immediately above.

Keeping sentences, paragraphs, and sections to these limits is not just our opinion. People under cognitive load have a lot going on in their heads. When experiencing cognitive overload, the amount of information they can keep in working memory is limited. So providing information in smaller pieces makes it easier to transfer that information to longer-term memory.

Additionally, you may be sharing new information with people. People learning new information need it in smaller pieces so they can chain it all together in their minds.

Headings

Use headings to break narrative text into chunks. Headings show the logical relationship between the different groupings of content and ideas on the page. Look at the headings on this page—you see how the ideas are related by looking at the headings. Your reader can understand more about your ideas and how they are linked together by looking at your headings.

Headings also make your content scannable. Headings make it possible for people to scan your document to find the information they need. For example, if a project manager is looking for the project's scope, she can scan for the section labeled **Scope** and ignore everything else.

Headings are also important if the document is read online. People visually scan documents, looking for what they need. For example, you wrote a troubleshooting article for the knowledge base. Your readers scan the article to see if it applies to their issue. Headings let them do that quickly and easily.

However, research also shows that putting a heading on every paragraph limits scanning and slows comprehension. The sweet spot is three to five paragraphs.[4]

Headings can also make the entire page look more open and inviting. This can be critical in technical material. A more open page makes the content look easier to read and understand. Humans are suggestible, so a page that looks easy to read often turns out to be easy to read. A page without headings is typically hard to read.

Try this: Open a textbook at random and place it at your feet. Do the pages look like gray blobs? Pick the book up and look more closely at the pages. Does a paragraph go on for several pages? Are there any headings after the name of the chapter? Does any of the content look like it's going to be easy to read and understand? Probably not.

Building sentences and paragraphs

At this point, you understand concrete things like active voice, present tense, how to construct sentences and paragraphs, and how to use headings. It's time to start putting it all together.

Topic sentences

Paragraphs start with a topic sentence. As you recall from high school, a topic sentence states the idea of the paragraph. You may have been told that you can place a topic sentence at the end of your paragraph. Not in technical writing.

You need the first sentence of the paragraph to tell your reader what this paragraph is about. Readers who don't know this material will use that sentence to understand what's ahead in this paragraph. Scanning readers can read the first sentence and decide if this is what they are looking for or if they should move on. Either way, it's critical that your reader get this important information up front—what is this paragraph about?

Sometimes, if you're covering very technical information, it's possible that you need to use two shorter sentences to function as one longer topic sentence. Often, this looks like:

- Complicated Concept 1 is related to Complicated Concept 2, and this changes Complicated Concept 3.

[4] "The Layer-Cake Pattern of Scanning Content on the Web" (Pernice 2019)

Often, it's the word *and* that's the clue that you might want to think about using two sentences as one topic sentence. How is that the clue? Because you already have a lot going on in this sentence before you get to the word *and*. After you get there, you're adding more complicated information. It's better to split this into two sentences, such as this:

- Complicated Concept 1 is related to Complicated Concept 2. Complicated Concept 2 changes Complicated Concept 3.

Notice how this example repeats the end of the first sentence at the beginning of the second sentence. You'll see another example of this in a few pages.

You should never need more than two sentences as a topic sentence. If you think you need three or more, you don't understand what you're writing about, or you're not explaining it clearly. Stop, go for a walk, take a break, and come back to it. You're trying to explain all the concepts at one time. Pick one and talk about it. In the next paragraph, talk about the next one, and so on.

The rest of the paragraph

The other sentences in the paragraph amplify and support the topic sentence. They further explain the concept or idea you presented in the topic sentence. The paragraph can end with an example that illustrates the concept. Examples help people better visualize what you're communicating.

Another way to end a paragraph is with a limitation or special case the reader should understand now that they know about the general class. Not every paragraph will end with an example or special case, but using one to end a paragraph can often clarify your communication.

Example paragraph

This section looks at an example paragraph that follows the writing guidelines. The example explains how to use dotfields in a configuration system. This paragraph assumes the reader already knows about using tags and properties in the system. Read it carefully. The following sections examine what this paragraph is doing and how.

Example paragraph

Each type of tag has a set of unique properties, and these properties are defined in dotfields. Dotfields can access, monitor, and modify tag properties. You can use dotfields to affect your animations by accessing and modifying any of the dotfields related to the tag selected. Not all dotfields work in all expressions.

Parsing the example

Let's examine how and why this information is working well. The first sentence is:

- *Each type of tag has a set of unique properties, and these properties are defined in dotfields.*

This is the topic sentence. The end of the first phrase is repeated as the beginning of the second phrase. This repetition links these phrases (and ideas) together. Remember, this example is shown here in isolation; the reader already knows about tags in general.

Next sentences:

- *Dotfields can access, monitor, and modify tag properties. You can use dotfields to affect your animations by accessing and modifying any of the dotfields related to the tag selected.*

These sentences explain what the reader can do with dotfields. These sentences are written to the reader. We start by repeating the word *dotfields* in the first sentence. Notice the second sentence starts with the "You can…" construction, pulling the reader right into why they care. They care because there is an action they can perform. The actions are not described from the product's point of view.

The last sentence:

- *Not all dotfields work in all expressions.*

This last sentence tells the reader about a limitation of the general class. The manual's authors needed to tell the reader about what dotfields can do before they tell the reader about the limitations. Of course, you now need to tell the reader about the specific limitations, perhaps in a table where you list all the dotfields.

Notice that no sentence is longer than 25 words. The longest sentence is 21 words:

- *You can use dotfields to affect your animations by accessing and modifying any of the dotfields related to the tag selected.*

Look at the amount of information in this long sentence. There are no extra words, and every word counts.

The paragraph follows all the writing guidelines discussed in this chapter. It's a strong, effective paragraph that communicates in a user-centric way.