Strategies for Technical Writing

Writing as Process

Recommendation (to keep audience in mind): Write a first draft for yourself. Get your explanations and as many details as possible down on paper.

Write a second draft directed by the question: what does someone reading my report need in my sentences in order to see clearly into my mind and through my eyes. Organizational structure and clarifying details are two aspects of the first draft that normally need the most revision.

Cohesion: given to new information

Engineering Sentences: Structures of Grammar

Basic (Core) Sentence: subject + predicate (doer of action + action)

This is the foundational structure of all sentences.

Jesus wept.
I rule.

Some predicates take a direct object to complete their meaning.

I threw a fit.

Prepositional Phrases: prepositions normally placed before nouns or pronouns to form a phrase that offers additional information about another noun or predicate in the sentence.

<table>
<thead>
<tr>
<th>Common Prepositions</th>
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<tbody>
<tr>
<td>about</td>
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<td>above</td>
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across    beside    into    over    until
after     between   like    past    unto
against   beyond    near    round    up
along     by        next    through   upon
among     down      of      throughout with
around    during    off     till      within
as        except    on      to       without
at        for       onto    toward   
before    from      opposite under

Jesus wept in the Garden of Gethsemani.
In winter, I rule.

**Verbal Phrases:** verbs with *ing* or *ed* endings that offer added information about a noun or predicate in a sentence.

According to the Bible, Jesus wept in the Garden of Gethsemani.

Irritated by a headache, I threw a fit.

**Compound Sentences:** Two sentences connected by an “and” or semi-colon.

Occasionally, it rains in Tucson, and water rushes through the dry riverbeds.

The dog barked I let it out.

**Subordinating Clauses:** subordinating clauses have patterns like sentences (subject, predicate, and sometimes object) but function as a noun or to offer added information about a noun or verb in the core sentence. To say this another way, a subordinating conjunction turns what could be a core sentence into a modifier or clause functioning as a noun.
Common Subordinating Conjunctions

<table>
<thead>
<tr>
<th>after</th>
<th>even though</th>
<th>since</th>
<th>until</th>
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<tr>
<td>although</td>
<td>how</td>
<td>so that</td>
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<td>before</td>
<td>rather than</td>
<td>unless</td>
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Although Vitruvius was not a felicitous writer (his style has been compared with that found in specifications and contracts), his work is the oldest surviving treatise on engineering.

Although many editions of this classic followed, including translations in French and German, an English translation of Frontinus was not made until a modern civil engineer, Clemens Herschel, took up the task in the late 19th century.

But surveys have shown that these activities are not easily avoided in the practice of the profession.

Noun Phrases

**Absolute phrases**: includes a noun or pronoun and a participle. It modifies the whole sentence versus one word.

The dry ice warmed to room temperature, smoke rising from my roommate’s hat.

**Appositive phrases**: includes a noun and modifies the noun or pronoun that comes before.

The proposal, a hefty twenty-four pages, was thorough and convincing.

Adjective Clauses: Begin with a relative pronoun and modify nouns and pronouns:

Relative pronouns: *that, what, whatever, which, whichever, who, and whoever*.

Engineers use fundamental science and complex mathematics *that generate precision* in their designs.

A recently graduated engineer *who cannot write* is in trouble.
**Infinitives**: A verb that begins with *to* (*to calculate, to write*) and functions as a noun or modifies a noun or verb.

Engineering students need **to improve** their technical writing skills. (functions as noun (direct object))

I will interview a professor of civil engineering **to obtain** information about writing as an engineer. (functions to modify verb, *will interview*—infinitives can take direct objects, and in this example *information* is its direct object)

**Infinitive Clause**: Nothing more than the infinitive with its direct object.

I will interview a professor of civil engineering **to obtain information** about writing as an engineer.

(*about writing* and *as an engineer* are prepositional phrases)

**General to Specific**: grammatical structure that help

All of the grammatical structures covered in this handout can help to make information more precise and specific. Prepositional phrases are the most common. Noun phrases, verbal phrases, adjective clauses, and infinitives are also commonly used.

**Transitions**: grammatical constructions that help

Verbal phrases, prepositional phrases, infinitive clauses, and coordinating clauses are helpful structures for making transitions from one subject or aspect of a subject to another.
Passive Constructions

The Book of Questions (excerpts)
By Pablo Neruda

Tell me, is the rose naked
or is that her only dress?

Why do trees conceal
the splendor of their roots?

If I have died and don't know it
of whom do I ask the time?

Why do leaves commit suicide
when they feel yellow?

What is it that upsets the volcanoes
that spit fire, cold and rage?

Do tears not yet spilled
wait in small lakes?

How old is November anyway?

And at whom does rice smile
with infinitely many white teeth?

How do oranges divide up
sunlight in the orange trees?

Who shouted with glee
when the color blue was born?

How did the abandoned bicycle
win its freedom?

Moving from Passive Sentences

Platforms, Tools, Languages

The application was implemented using Linux machines in the MultiLab of the College of Engineering but should function on other platforms although this has not been tested. The database was created using MySQL. Most of the code is implemented in Ruby on Rails, and the website was hosted using Mongrel. Additionally, we used JavaScript for various parts of the application as well as HTML files that were used to layout the basic webpage.

Here is one possible rewrite, moving away from passive constructions like “was implemented,” “was hosted,” “was created,” “is implemented,” and “were used”:

We designed the application to run on any platform. For testing, however, we operated in a Linux environment, using Mongrel web services; we have yet to test the software for cross-platform compatibility. In addition, the application uses a MySQL database, with the majority of its code implemented in Ruby on Rails. For the web interface, we used JavaScript and HTML files.

To eliminate passive constructions, I used “we” as the subject in a number of the sentences, since it is a “we” who developed this application. Also, in the spirit of Neruda’s questions, I let “application” be a doer in one sentence: “The application uses ...” Applications use things like databases; therefore, as a writer, I can take advantage of this type of doing to make “application” my subject and doer of the action.

Moving away from passive constructions allows readers to visualize the subject of a sentence doing the action portrayed in the verb. Also, it reduces the number of words needed to communicate the same information. Readers always appreciate this in a report—less to read!