Introduction to Technical Writing

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Phillip R. Polefrone

PhD Candidate, Columbia University

Associate, Cooper Union Writing Center

What is Technical Writing?

- **Technical writing** communicates information about a device, technique, or situation to a defined audience for a specific purpose.
- **The audience** of technical writing is usually a *technical reader*, a *managerial reader*, or a *general reader* (Shelton 1.2).
- **The purpose** may be to *propose a project*, *outline a problem*, *provide instructions*, or *report results*.

Genres of Technical Writing

Public Documents

- *For technicians*: technical manuals, instructions, process/machine descriptions, documentation, code comments
- *For a more general audience*: journal articles, magazine articles, patents, marketing materials...

Internal Documents

- *For managers and funders*: grant proposals, progress reports (formal and informal), research reports
- *For day-to-day operations*: emails, memos, bug descriptions, schedules. THIS IS ALSO WRITING!

Writing Exercise 1: Device Description

Writing: 10 minutes. Sharing: 5 minutes.

1. Pick a device you have used in the past week or two. It can be mechanical or electronic, but it should be relatively simple. Don't tell anyone what this device is.
2. Explain what this device IS.
3. Explain how it works *as simply as possible*---if it helps, imagine you are writing to a younger relative.
4. Read the description to the person next to you. Can they guess the device?
5. Read your instructions to your partner. Partner: would you be able to follow these instructions? Why or why not?

Sentence Clarity

"In symbols one observes an advantage ... when they express the exact nature of a thing briefly and, as it were, picture it; then indeed the labor of thought is wonderfully diminished."
— Gottfried Leibniz, Philosopher and Mathematician

"When I wrote this, only God and I understood what I was doing. Now, God only knows."
— Karl Weierstrass, Mathematician

Passive Voice

Sentences with passive verbs.

1. All Engineering Change Notices must be approved by the engineering manager.
2. Antiseptic content was not properly analyzed by our satellite lab.
3. Excessive engine wear is also characterized by low compression readings.
4. The faulty valve was quickly found by the emergency maintenance crew.
5. The voltage across the circuit was measured by assembly personnel at three different points.

Examples from James H. Shelton, *Handbook for Technical Writing*, 1.5.2

Passive Voice

Instructions:
1. Identify the verb phrase, as I've done in this example.
2. Rewrite the sentence to make it active.
   a. Ex.: The engineering manager **must approve** all….

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Passive Voice

Passive sentences made active:

1. The engineering manager must approve all Engineering Change Notices.
2. Our satellite lab improperly analyzed antiseptic content.
3. Low compression readings also characterize excessive engine wear.
4. The emergency maintenance crew quickly found the faulty valve.
5. Assembly personnel measured the voltage across the circuit at three different points.

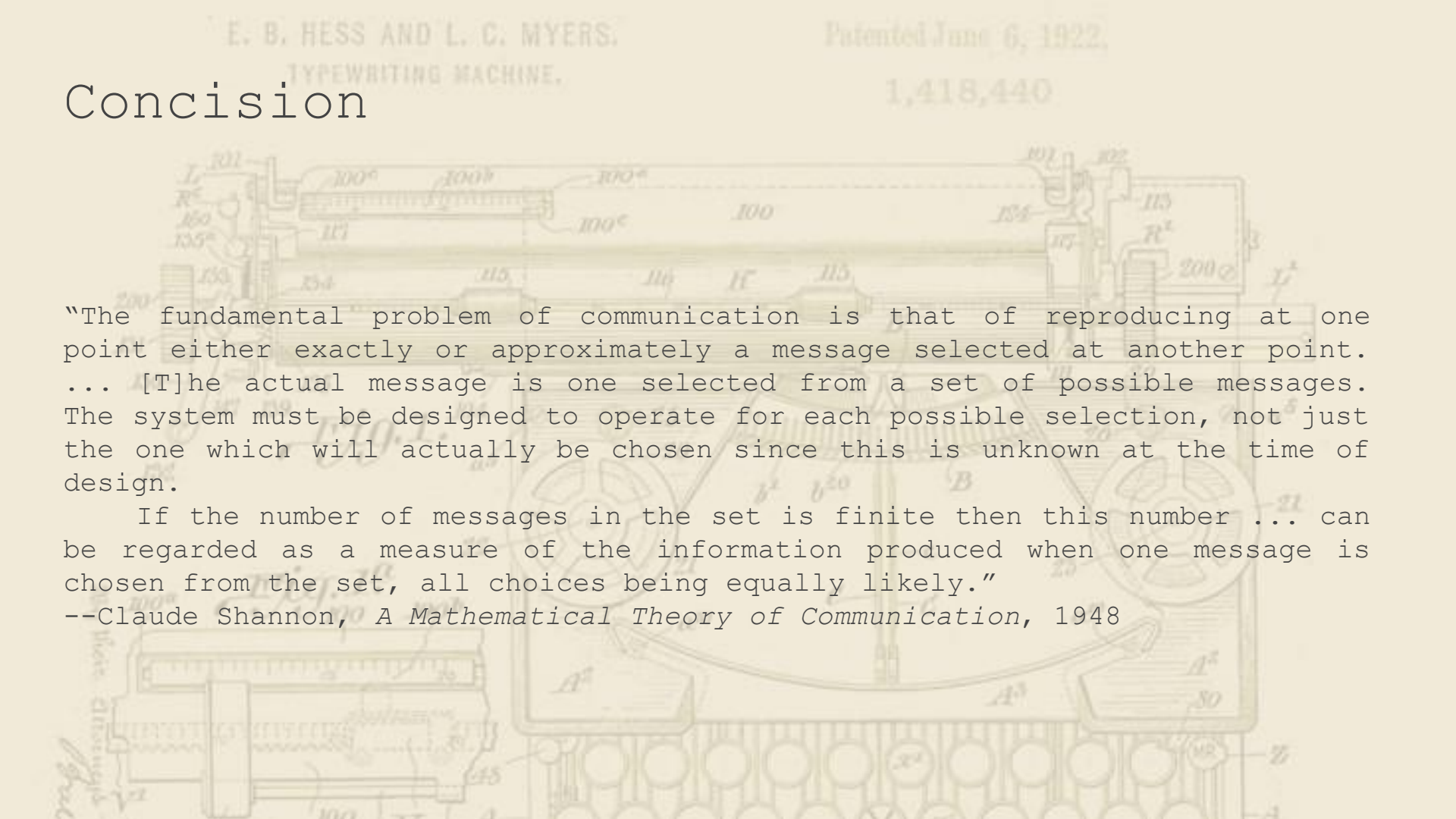Examples from James H. Shelton, *Handbook for Technical Writing*, 1.5.2

The Passive Voice

When to use passive verbs:

- *To be impersonal:* Many journals and labs think using "I" or "we" is too personal. "Samples were taken from three different points" would then be preferred to "We sampled…." *Consider using the passive voice when your team is the subject.*
- *When the "doer" doesn't matter*

When to use active verbs:

- Most other times.
- Takeaway: prefer active verbs unless you have a specific reason not to.

Concision

"The fundamental problem of communication is that of reproducing at one point either exactly or approximately a message selected at another point. ... [T]he actual message is one selected from a set of possible messages. The system must be designed to operate for each possible selection, not just the one which will actually be chosen since this is unknown at the time of design.

   If the number of messages in the set is finite then this number ... can be regarded as a measure of the information produced when one message is chosen from the set, all choices being equally likely."
--Claude Shannon, *A Mathematical Theory of Communication*, 1948

Concision

101 100 100 100 100 101 102
L 101
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Wordy

Polymer surfaces were studied to determine if physical surface changes occur with continued UV exposure. This program was necessitated to meet customer expectations for a longtime company with world-class name recognition. If surface degradation is in fact occurring, we need to ascertain and assess the severity of this degradation. Moreover, it is imperative that we address any product deficiencies so that the company image as a supplier of robust products is not denigrated.

Preferred

A study was conducted to quantify UV damage to polymer surfaces. This work was done to satisfy customer concerns about the weatherability of sun shields made from our outdoor grade of polypropylene.

Examples from Kenneth G. Budinski, *Engineer's Guide to Technical Writing*, 8

Concision

1.

Polymer surfaces were studied to determine if physical surface changes occur with continued UV exposure.

A study was conducted to quantify UV damage to polymer surfaces.

2.

This program was necessitated to meet customer expectations for a longtime company with world-class name recognition. If surface degradation is in fact occurring, we need to ascertain and assess the severity of this degradation. Moreover, it is imperative that we address any product deficiencies so that the company image as a supplier of robust products is not denigrated.

This work was done to satisfy customer concerns about the weatherability of sun shields made from our outdoor grade of polypropylene.

Writing within a Structure

The Format of a Formal Technical Paper

- Introduction (why you are doing the work)
- Procedure (what you did)
- Results (what happened)
- Discussion (what it means)
- Conclusions (what was learned)
- Recommendations (what is to be done with the new information or knowledge)

Source: Kenneth G. Budinski, Engineer's Guide to Technical Writing, 10

Conclusion