

TIPS ON WRITING ARTICLES WITH IMMEDIATE PRACTICAL APPEAL

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IDEAS YOU CAN USE TO WRITE MORE EFFECTIVELY

THE KEY TO A SUCCESSFUL TAPPI JOURNAL ARTICLE is a clear understanding of your readers and their needs. Above all, readers want information that has practical significance for them—information they can apply directly to their work or adapt to fit their circumstances. They want material organized so they can quickly find the portions that are important to them. Specifically, your readers are interested in:

- Current issues or problems affecting their work area
- Solutions to those problems
- A complete explanation of how to implement the solutions, presented by knowledgeable people.

On the other hand, they dislike:

- Excessive details that get in the way of understanding the overall problems and solutions
- Wordiness or an overly precise, academic style
- Missing information (e.g., vague product descriptions) that would require them to contact the author before they can try to implement the solution.

STEP-BY-STEP SUGGESTIONS

Identify your primary readers. For a paper about neural-network diagnosis of web breaks on newsprint machines, they might be paper machine supervisors, process engineers, and computer system specialists.

Think who else is in any way affected by the issues you are discussing. These are your secondary or general readers. For example, any engineer or manager of technical operations may be interested to learn how to apply neural-network diagnosis to problems that defy conventional analysis.

Write down your readers' main questions about your subject and answer them briefly. These questions can provide your major section headings. Consider your general readers first, because they have the kinds of basic questions you should address in your summary,

conclusion, and other general sections. Here are some questions you should always answer:

- *What is the specific problem or concept?* Web breaks on newsprint machines are costly and disruptive. Unfortunately, their causes are often hard to diagnose, because there are too many variables for conventional analysis.
- *What is the proposed solution?* Apply neural-net work diagnosis to variables that cannot be disentangled enough to allow conventional analysis. A neural network can succeed because it simply learns from data.
- *How can this be used to improve products, operations, or management?* Consider all the things you can do with it: improve safety or pollution control, create new products, make processes faster, reduce quality problems, lower cost, increase sales, reduce machine downtime, etc. Neural-network analysis saved our mill US\$ 1 million/year by reducing news-print web breaks. For complex, nonlinear problems, it is much simpler than conventional statistical regression analysis.
- *How is it implemented?* If possible, give a step-by-step procedure. The neural-network analysis used a computer package XYZ. The network was set up with 41 input nodes (reflecting 41 process variables we had measured) and two output nodes ("normal" and "web break"). The network was trained until it made fewer than 5% erroneous web-break predictions.
- *What are examples of applications?*
- *How can readers adapt the solution to their own environment?* Neural-network diagnosis can be applied to any situation in which conventional statistical methods can't easily identify main causes among many variables.
- *What costs, risks, disadvantages, and obstacles to implementation do we need to be aware of?* Neural networks must be trained to make correct predictions. In our case, the network was trained 500 times, which resulted in 95% accuracy.

- *Where has this been tried successfully? Add examples or case histories to strengthen the credibility of your suggestions.* Neural networks have been used successfully in the chemical industry to detect and diagnose production problems.

Draft a conclusion that incorporates your main suggestions and benefits of your solutions. This gives practical focus to your ideas and streamlines the writing process.

For each section, again summarize the main points first, in terms that are meaningful to the general reader. Then consider more specific reader questions and answer them in the text. Use subheadings as guideposts to show your reader what questions you are answering.

Decide what drawings, illustrations, and charts would help readers understand your ideas better.

Edit your draft.

SUGGESTIONS ON ORGANIZATION

Good organization gives readers quick access to the information that is of greatest interest to them and allows them to skip what they don't need. Here are some common complaints about organization and some simple remedies.

Key information is hard to find:

1. Put that information into Summary, Conclusions & Recommendations, and Introduction.
2. Add clear, descriptive headings (e.g., "Coloring Process" and "Color Control" rather than "Discussion") to guide readers to the information they want.
3. Start each section with a general statement of its main point, before going into details.
4. Put the main point of any important paragraph into its first sentence.

Headings and organization seem inconsistent:

1. Keep your organizational scheme simple.
2. Use no more than three levels of headings.
3. Make headings typographically consistent.

Specialized detail obscures general points:

1. In results sections, summarize overall findings before presenting details.
2. Move details into discussion sections.
3. Put material that is of interest to few readers or that destroys the flow into an Appendix.

TIPS ON INCREASING PRACTICAL APPEAL

- If possible, include case studies illustrating actual or hypothetical applications.
- If you have a lot of practical advice on your subject, consider including specially highlighted tips throughout the article to draw in readers and keep them interested.

There are a lot of confusing technical terms and abbreviations:

1. Cut down on unnecessary abbreviations.
2. Add a list of technical terms and abbreviations at the end of the article.

GUIDELINES ON STYLE

You can make even complex technical matter easier to understand if you use clear and simple style. Here are a few suggestions.

Write only one thought to a sentence. People read linearly; they can digest only one thought at a time.

Too many thoughts: The existing reservoir in most older mills, whether or not due to expansion, could probably benefit from a thorough cleaning, as well as a review of conditioning and monitoring equipment, and should include a calculation of oil retention time and reservoir capacity.

Better: The reservoir in most older mills could probably benefit from a thorough cleaning. It would also be wise to review conditioning and monitoring equipment, being sure to calculate oil retention time and reservoir capacity.

Use the active voice when possible. People can visualize who did what or what happened. It is much harder to take in what was done by whom (or what).

Passive voice: Pulp at any pH between 4 and 10 can be bleached effectively by both sequences.

Better in active voice: Both sequences can effectively bleach pulp at any pH between 4 and 10.

Write conversationally, using personal pronouns (I, we, you) and simple words ("list," "reduce" rather than "enumerate," "effect a reduction"). People like to read varied, lively language. Particularly when the content is difficult or deeply technical, straightforward language is best.

Overly formal: In previous research, it was shown [by whom?] that the identical bleaching sequence employed in the study being reported in this paper effected a reduction of 20% in extractives.

Conversational: Previously, we showed that the same bleaching sequence as the one used in the current study reduced extractives by 20%.

Omit irrelevant detail and unnecessary repetition. The less you clutter your sentences, the easier it is for the reader to understand them.

Cluttered: With this in mind, Operations Analysis set out to develop a productivity measurement system that would be a tool plant management could use to guide decision making and to direct action toward successful productivity improvement.

Lean: With this in mind, Operations Analysis set out to develop a system that plant managers could use to measure and improve productivity. **TJ**

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