MODELING THE COMMUNICATION CONTEXT: A PROCEDURE FOR GOAL-SETTING IN TECHNICAL WRITING

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In "A Cognitive Process Theory of Writing," Linda Flower and John Hayes discuss the act of composing as "a goal-directed thinking process, guided by the writer's own growing network of goals."[1] They suggest that "writers create their own goals . . . by generating both high-level goals and supporting sub-goals which embody the writer's developing sense of purpose . . . ."[2] Moreover, these goals are further defined and grow in complexity as the writer composes: abstract goals become operational; high-level goals are developed in terms of a hierarchical set of sub-goals. In fact, Flower and Hayes say, only poor writers remain at the level of abstract goals.

Flower and Hayes stress the fact that, for experienced writers, the process of goal-development is not linear: i.e., occurring once in the composing process. Instead, new and more effective sub-goals may be generated at any time, thus permitting the writer maximum control over composing.

This idea of continuously developing sub-goals is an

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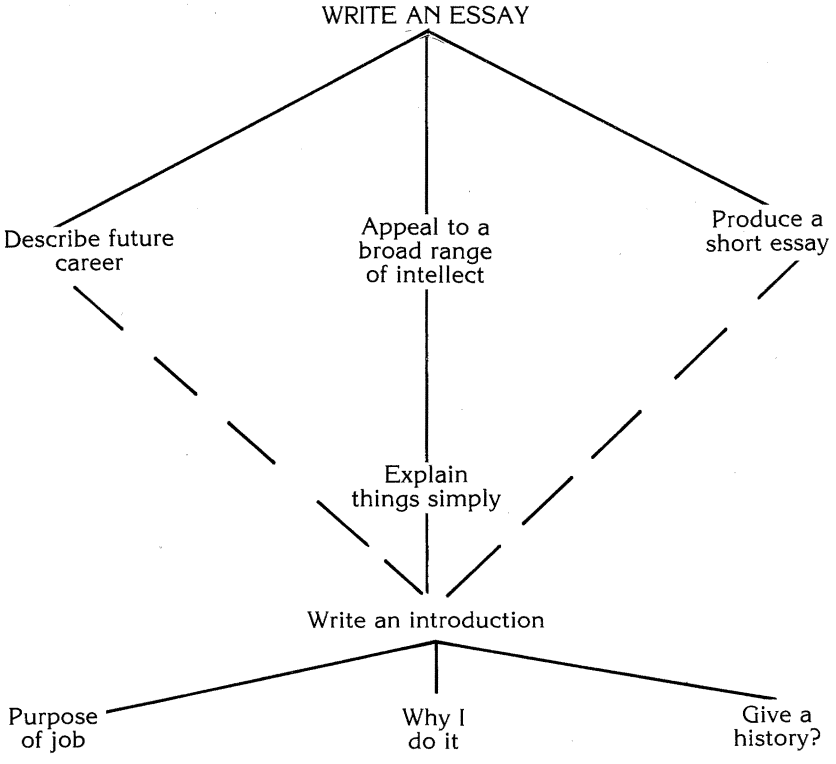
important aspect of Flower's and Hayes' theory: unlike stage theories of composing, where goal-development is placed in pre-writing, Flower and Hayes indicate such development may occur and recur.

This insight is useful and valid in terms of the composing processes of experienced writers. Nevertheless, research indicates that experienced *technical* writers also *begin* the composing process with complex, well-defined sets of goals and sub-goals which structure and direct their writing.[3] This complexity and definition result from the situational nature of technical writing, where writers can usually pinpoint their audiences, and the purposes and uses of their documents with a high degree of accuracy. These known parameters then greatly aid the goal-setting procedure.

As an illustration, consider the partial network of goals I reproduce below, from Flower's and Hayes' article, and a similar partial network for a technical writer:



Notice that the technical writer's high-level goal is already more concrete than the writer's in Flower's and Hayes' illustration. "An essay" may have many purposes, include many kinds of content and follow many patterns of arrangement. In "a trouble-shooting report," on the other hand, these parameters are defined:

- The purpose is to discuss a problem and recommend a solution or solutions.
- The content concerns this problem and these solutions.
- The arrangement, as dictated by the purpose, has a naturally developing order: a discussion of the problem followed by a discussion of solutions.

The technical writer's high-level goal, then, is already operational (i.e., directional) because it is circumscribed by his technical task.

Moreover, the technical writer continues to evolve more concrete sub-goals than does the writer in Flower's and Hayes' example: his second-level goals, which concern content, stylistic and structural questions, are each more precise. For example, the content decision, "Describe the problem with Z Company's automatic clothes dryer assembly line," focuses on an exact subject: *this* particular problem at this particular company with this particular automatic clothes dryer assembly line. On the other hand, "Describe future career" does not suggest the precise kind of detail such an essay might include.

Similarly, the stylistic decision, "Write for upper management of Z Company," includes a more specific and thus more helpful audience-direction than "Appeal to a broad range of intellect." The technical writer realizes, as his third-level goal "use non-technical language" indicates, that management of Z Company will not understand mechanical engineering terms so he must avoid the use of technical words. He has made a specific dictional choice. On the other hand, "things" may be explained "simply" in many ways, of which "using non-technical language" is one example.

In addition, the structural decision of the technical writer is also more concrete. Notice that he has been able to specify the sections he will include in his document whereas the writer in Flower's and Hayes' example has only specified length. Since the technical writer must compose a trouble-shooting report and these reports, like many other documents in technical writing, follow accepted or traditional structures, the situational nature of technical writing has aided this writer in structural as well as content and stylistic sub-goal-formation. On the other hand, since essays may take many forms, Flower's and Hayes' writer delays concrete structural decisions, at this point stipulating only length.

The technical writer's fifth-level goals, which concern the content of his introduction, are similarly better-defined than those of the writer in Flower's and Hayes' illustration. Because introductions to trouble-shooting reports traditionally include certain kinds of material, from which the writer selects those his audience requires, this writer is able to list precise details he will include, as well as give the order he will follow:

Authorization statement
Background on problem
Forecasting sentence

Flower's and Hayes' writer, on the other hand, lists three items of information, with a question concerning one, and in a seemingly random rather than developing order. Unlike the technical writer then, he or she has not decided at this point on the precise content or arrangement of the introduction.

Because technical writers' high-level goals are already more concrete and operational than those of other writers and because technical writers continue to evolve more concrete sub-goals, the technical writer's pre-writing period is also more structured and better-defined. Analyzing the audiences of a document, the writer's purposes and the uses of a communique, and strategies for accomplishing these purposes — essential components of this pre-writing time — become techniques for setting goals (specific guidelines for composing) *before* the document is written. Therefore, although experienced technical writers may alter their sub-goals if they discover more effective techniques for accomplishing their purposes, they enjoy the direction that concrete high-level and sub-goals provide early in the composing process.

This fact has important implications for pedagogy in technical writing: *if goal-setting is taught as part of the preparation for writing documents, students also gain the structure and direction their professional counterparts enjoy.* In order to provide this form of instruction, I developed the method described below.

Modeling the Communication Context

This method depends on two techniques: student-created cases utilizing material from students' major fields and a model of the communication context. The first technique asks students to evolve a complete communication situation for all documents they write — a job role for themselves and audiences, purposes and uses of their communiques. In this way, students gain practice in the investigative procedure experienced technical writers employ when they "create" or explore their communication situations. Moreover, students also gain the direction such on-the-job situations provide.

The second technique gives students a model for describing that communication context and setting both high-level and sub-goals. Thus the model functions as a goal-setting aid, to be employed early in the composing process.

With the student example below, I demonstrate the use of these techniques.

Student-Created Cases

Ellen Conzett, a senior in civil engineering, selected the job role of highway construction consultant for writing her formal technical report. She drew on material from a highway design class in order to construct her communication context.

For this class, she was required to study a design problem (a highway by-pass of X-ville), explore alternative routes, recommend one and design the highway. The result was a 50-page technical report, with the professor of her design class as the only audience.

When she created her communication context, however, she developed a situation she might encounter on-the-job. As a highway construction consultant with Black and White Consulting Firm, she had been contracted by the Highway Planning Commission of X-ville to study roadway congestion in their town and recommend a solution. This student-created communication context then provided Ellen with real-world audiences, purposes for her writing and uses of her report, which aided her in setting her goals.

Ellen's next step was to model her created communication context and articulate her goals.

A Model of the Communication Context

I have provided my students with a three-part model for picturing their communication contexts:

- Part #1: Audience Analysis
  Identifying, classifying and characterizing readers
- Part #2: Purpose and Use Analysis
  Primary and secondary writing purposes and reader-uses of the report
- Part #3: Goal-Setting Analysis
  High-level and sub-goals for accomplishing their writing purposes

I give this three-part model below, with the information Ellen listed in her highway consultant role and annotations on the guidance various entries provide.

The brief job description tells Ellen these readers are not the only decision-makers in her communication situation.

This information implies a subordinate relationship, which influences stylistic goals.

Ellen knows she must convince the Highway Commission first, of the validity of her recommendations, since they are her primary readers. The report will then go to secondary readers.

Educational background assists Ellen with setting stylistic goals.

Ellen knows her primary readers do not have degrees in her field or training in her subject. These facts aid her in setting content and stylistic goals.

Part #1: Audience Analysis

Identification

1. Name: William Long
   Thomas Cooper
   Dennis Kasselbaum
   Samual Rank
2. Title/Job Role: Highway Planning Commission
3. Affiliation: X-ville, IA
4. Brief Job Description: The Highway Planning Commission oversees the road system for X-ville and submits recommendations to the mayor and the City Council.
5. Relationship to writer: client

Classification

____ Primary
____ Secondary

Characterization

1. Educational Background
   Years of Schooling: The Highway Planning Commission vary greatly in educational background. Rank has completed high school; Long and Cooper have finished college; Kasselbaum has a college education plus three years.
   Degree Attained: Rank — H.S. diploma
   Long — B.S. in agronomy
   Cooper — B.A. in political science
   Kasselbaum — MBA
   Additional Training in Relation to Subject: None

My readers vary greatly in educational background. Therefore I must keep my style simple. In addition, none of my readers has had training in highway design. They will not understand highly technical or theoretical material.

None of Ellen's primary readers are in her area of specialization: civil engineering. This fact also helps her set general content and stylistic goals.

2. Technical Background
   Area of Specialization:
   Rank — feed store operator
   Long — farmer
   Cooper — newspaper editor
   Kasselbaum — Accountant

My readers are all outside my area of specialization. I cannot include highly technical content or write as I would to civil engineers.

This grid gives Ellen a systematic way of examining her audience's technical experience. Notice that she is unsure of their precise level of experience in several categories.

Technical Experience in Relation to Subject:

Experience	Extensive	Moderate	Little
Theory (of highway design)			✓
Design			✓
Construction			✓
Operation		✓	
Management		✓	
Maintenance		✓	

Ellen articulates the insights the grid has provided and sets general content goals.

My readers do not have a theoretical background in highway design or a knowledge of highway construction. However, depending on their length of service on the commission, they have a moderate to extensive background in practical roadway questions: operation, management, and maintenance. Since most of my information concerns the first three categories, however, I will have to remain very general in content.

This reader-characteristic tells Ellen her audience may resist her recommendations. This fact will aid her in setting structural goals.

Reader Characteristics Affecting the Document: Mr. Long's uncle owns the farm through which the recommended route will run. Mr. Long will probably oppose my recommendations. I must take this fact into account when I place my recommendations in my report and order them.

Identification

1. Name: Paul Gorley
   Alice Hickson
   Terry Brenahan
   Lenore Ashbury
   Knut Lanihan
   Scott Crosley
   Robert Weisman
2. Job Role/Title: Mayor
   City Council
3. Affiliation: X-ville

This fact tells Ellen she must convince seven other readers of the worth of her recommendations.

4. Brief Job Description: The mayor and the City Council vote on all recommendations of the Highway Planning Commission.
5. Relationship to Writer: clients

Classification

____ Primary
____ Secondary

Characterization

Ellen recognizes that her secondary audience has the same variety of educational background as her primary audience. Therefore her stylistic goal does not need to be amended for these readers.

1. Educational Background
   Years of Schooling: My secondary readers also vary greatly in educational background — from a high school education (Lanihan) to post-college (Ashbury/Crosley)
   Degree Attained: Again, my readers vary considerably, from high school diploma to a Ph.D.
   Additional Training in Relation to Subject: None

My secondary readers have the same variety of educational background as my primary readers, so the simplicity of my style will be suitable for them as well.

Ellen's secondary audience is also outside her area of specialization, so her content and stylistic goals apply to this audience as well.

2. Technical Background:
   Area of Specialization:
   Gorley — minister
   Hickson — housewife
   Brenahan — high school football coach
   Ashbury — instructor in local college
   Lanihan — local merchant
   Crosley — lawyer
   Weisman — policeman

This audience is also outside my area of specialization. Therefore they will require the same content, expressed in a non-technical way, as my primary audience.

Technical Experience in Relation to Subject:

Ellen's secondary audience has less experience with highway questions than her primary audience.

Experience	Extensive	Moderate	Little
Theory			✓
Design			✓
Construction			✓
Operation			✓
Management			✓
Maintenance			✓

Ellen realizes she does not have to alter her content goals to serve her secondary audience's needs.

My secondary readers will probably know very little about roadway questions. Therefore the general content I provide for my primary readers will serve my secondary readers' needs as well.

The implications of this fact again convince Ellen that the Highway Planning Commission is her most important audience.

Reader Characteristics Affecting the Document: My secondary readers are all busy people; most hold jobs in addition to their civic duties. Therefore they may rely even more heavily on the commission's recommendation as they may only have time to skim my report. I must work especially hard to convince the commission of the worth of the by-pass.

Part #2: Purpose and Use Analysis

Purpose

This grid gives Ellen a systematic way of considering and classifying her general purposes.

Writer's Purposes		
Purpose	Primary	Secondary
To entertain		
To inform		
To instruct		
To persuade		

Ellen articulates her general purposes, then particularizes these purposes in relation to her specific communication situation.

My primary purpose with all audiences is to persuade. I must convince the Highway Planning Commission first and the mayor and City Council second that the route I am recommending is the best.

Ellen sets up a classification of purposes and indicates their interrelationship. She then articulates the implications of these purposes.

This primary purpose depends on a secondary purpose: to inform. I must give my readers enough background on the proposed route so that they will understand my recommendations and decide for them.

This grid allows Ellen to consider and classify general reader-use.

Readers' Uses of the Document		
Use	Primary	Secondary
To be entertained		
To gain knowledge		
To perform an action		
To make a decision		

Ellen also articulates her readers' general use of her report, then particularizes that use.

My readers' primary use of my report is to make a decision: they will decide for or against constructing the by-pass on the basis of this document.

Ellen also sets up a classification for reader-uses, indicates their interrelationship and gives the implications of that interrelationship.

This primary use depends on a secondary use: to gain knowledge. If my readers do not have sufficient information about the by-pass or if I give them the wrong kind of information, they will not be able to reach a decision.

Parts #1 and #2 of the model provide students with background information they then use in setting their goals. Notice that they have already formulated several goals when they reflect on the information given in their audience, and purpose and use analyses. However, part #3 of the model, Goal-Setting Analysis, asks them to articulate their high-level goal and specific sub-goals for accomplishing their purposes in the areas of any rhetorical piece: content, arrangement and style.

I give Ellen's goal-setting analysis below. As my annotations show, the well-defined nature of her communication context has resulted immediately in concrete goals.

Part #3: Goal-Setting Analysis

Ellen's high level goal is already concrete. She states well-defined audience and purpose parameters. These parameters help her delimit content (optimal bypass route) and structure (recommendation report).

My high-level goal is to write a recommendation report to the Highway Planning Commission, the mayor and the City Council of X-ville on the optimal route for a highway bypass of their town.

Content

My primary sub-goal for content is to provide my audiences with the information they need in order to decide for or against the bypass. This information will also accomplish my persuasive purpose. To fulfill this sub-goal, I will include the following sections in my report:

Ellen states both the content of her opening section and the basis for her choice of detail. Notice that her well-defined communication situation allows her to state specific sub-goals for content early in the pre-writing period.

1. Existing Conditions of Highway 50

In this opening section, I will describe the current congestion on Highway 50, with figures on accidents per month, as necessary background for my recommendations. I will also project traffic estimates to the year 1990. With these facts, I will show that Highway 50 will be unable to handle future traffic volumes. Thus I will fulfill my audiences' need for information and persuade them of the worth of my recommendations at the same time.

Ellen states an exclusion her previous analyses allow her to make.

I will *not* include my specific recommendations in this section, because of possible audience-resistance to them.

2. Proposed Route

This section will have three sub-sections:

Ellen again states her sub-goals for content and the reasons for them, based on audience and purpose. She continues this pattern throughout the analysis.

— By-Pass Location

I will first discuss alternate routes in order to show the disadvantages of other possible locations. In this way, I will counter audience objections to my recommendations. I will then describe the recommended route, with a map as a visual aid to help my readers locate the by-pass. Thus this section will inform my readers on the by-pass but will also persuade them of its value by comparing this by-pass to alternate routes they might prefer — since neither passes through Mr. Long's uncle's farm.

Ellen articulates a content sub-goal which is also an arrangement sub-goal, based on reader-characteristics: use of a table.

— Traffic Analysis

In this sub-section, I will give a breakdown on traffic figures for the by-pass in tabular form, for 2-year intervals, from 1984 to 1990. The tabular form will allow my busy readers to assess this information easily. I will then discuss traffic removal from the central city, in terms of the figures given. This information should show my readers the effectiveness of the by-pass.

Ellen again states content sub-goals which are also sub-goals for arrangement: how she will order her discussion, and why, based on audience-interest.

— Environmental Impact

Here I will show that the by-pass will have no adverse effects on the natural environment in terms of disturbance of natural life, noise level or pollution. I arrange my discussion here from least-to-most important in terms of my audiences' concerns (e.g., natural to human life), to build to my most persuasive point.

I will then show that the proposed route disturbs X-ville's human environment less than the alternate routes: only one farm is located in the proposed corridor; the junior college and the 4-M plant

south of X-ville are avoided; no cemeteries, churches or public facilities (e.g. hospitals) are disrupted. Again, I arrange this discussion in terms of broadening interest to my audience. I also place human after natural environment to end this section with my strongest persuasive point.

3. By-Pass Cost

Ellen's content sub-goal is also an arrangement sub-goal: how she will order her information and why.

After my readers understand the location and the advantages of the proposed route, they will be very interested in cost. I will present a break-down, in tabular form for easy access of the information, of the by-pass costs and will point out that these figures are less than the costs of alternate routes. Thus I hope to counter reader-resistance because of the farm to be bisected.

4. Recommendation for the By-Pass

Ellen is aware of her interrelated purposes, which her content sub-goals should have fulfilled.

In this section, I will sum up the advantages of the proposed by-pass, to organize my previous discussion for my readers. Again, I'll arrange the advantages from least-to-most important, so that my concluding section builds in reader-impact: environmental effect, improved traffic flow, cost. I will then simply end with my recommendations for the by-pass. If I have informed my readers effectively on the by-pass' advantages, they should be persuaded to decide in its favor at this point.

Arrangement

Ellen sets her sub-goals for structure with the reasons for her choices and the effects she wishes to have on her audiences.

Structure. My major sub-goal with structure is logical progression of the parts of my report, so readers may follow my train of thought and my developing argument for the by-pass. My report will have the commonly accepted structure of the recommendation report: introduction, discussion of the recommendation, conclusion. The only alteration I will make is the division of my discussion into two sections: Proposed Route and By-Pass Cost. I

will separate these topics because of my purposes and audience-needs. The section on the proposed route will inform my readers about the by-pass, in order to persuade them of its advantages. However, they will not accept my recommendations if the by-pass is too expensive. Therefore, since cost is a major consideration of my readers and a major element in my argument, I will emphasize its importance by placing the cost analysis in a section by itself. Moreover, I will also follow the order of least-to-most important (proposed route → cost), so I can end with my most convincing point.

Ellen discusses her major sub-goals for format, then articulates specific sub-goals for achieving her aims. She considers foregrounding lists, white space, headings and use of a numbering system.

Format. My major sub-goals with all formatting techniques will be readability, since my readers are all busy people, and emphasis of important material. I will use lists to foreground and organize the three alternate routes in the first section of my report and the advantages of this by-pass route in the fourth section. The last list will be especially important in fulfilling my persuasive purpose as the list will allow my readers to assess and remember this crucial information. I will further foreground the lists by indenting them 5 spaces from each margin. I will also use white space to set off my map and my two tables, in order to call reader-attention to them and provide eye-relief.

I will have a title for my report and two levels of headings, to guide my readers through my material and allow them to assess it easily. I will center my title and capitalize it. I will center my first-level headings, using capital and small letters, and put second-level headings at the left margin, also in capital and small letters. This differentiation in terms of format will make the levels of the headings and the levels of the information that follows clear to my readers, thus enabling them to dis-

cern the hierarchy of information in my report and the logical connections of my ideas. I will also use the decimal numbering system, in conjunction with my headings, for the same purpose:

1.0 Existing Conditions of Highway 50
2.0 Proposed Route
    2.1 By-Pass Location
    2.2 Traffic Analysis
    2.3 Environmental Impact
3.0 By-Pass Cost
4.0 Recommendation for the By-Pass

Style

My major stylistic sub-goal is suitability to the audience addressed.

Notice that Ellen's stylistic sub-goals are less concrete than her content and structural sub-goals. She sets broad guidelines for style in the pre-writing period, then particularizes these guidelines while writing the report when she actually constructs sentences and chooses words.

Sentence Length, Structure and Complexity. Since my audiences vary greatly in educational background, I will write using short sentences (14 to 17 words average length) and will not include many ideas in each, but will keep my sentence structures simple. I want to assure that all my audiences will find my report readable.

Diction. I will also keep my overall diction simple, for the same reason given above. In addition, I will not use technical language from the engineering field since none of my readers has a background in civil engineering or in highway design. If I use any technical language, I will be careful to define my terms.

Voice. I will write largely in the active voice when describing the existing conditions and the proposed route, since the active voice suits description. However, where necessary, I will use the passive voice to de-emphasize myself as recommender (e.g., "The following alternate routes were considered.") The passive voice will also give my report a tone of objectivity, suitable to an investigation of this type and convincing in fulfilling my persuasive purpose. I want my readers to feel

an objective, scientific examination was carried out and is being presented to them.

Tone. As I mentioned, I will remain objective in tone. I do not want my audience to feel I have an "axe to grind" in recommending my proposed route. The passive voice will help me achieve this tone.

With the three-part model I have given above, I provide my students with a tool for setting concrete high-level and sub-goals early in the composing process. Of course these goals may change if the writer discovers more effective subgoals for content, arrangement, or style. Nevertheless, this full articulation of goals as part of the pre-writing time assures that my students' writing will be purposeful and directed. Moreover, the use of student-created cases facilitates this goal-setting process by giving students the guidance situational writing provides. Thus students are introduced to the type of composing they will do on-the-job and to goal-setting as a means for controlling the composing process: two elements of successful technical writing.

NOTES

[1]Linda Flower and John Hayes, "A Cognitive Process Theory of Writing," *College Composition and Communication* 22 (1982), p. 366.

[2]Flower and Hayes, p. 366.

[3]Jack Selzer ("The Composing Process of an Engineer," Paper delivered at the Modern Language Association Convention, December, 1981) discovered in his in-depth study that his subject had a remarkably linear composing process. This process began with an extremely well-developed pre-writing period where the writer set explicit goals for content, arrangement and style, and thoroughly planned his piece. My own studies of experienced technical writers indicate similar development *and* direction of the pre-writing time. In fact, experienced technical writers often preplan their documents so extensively that their writing period is largely a transcription of pre-writing ordering devices (e.g., outlines).

[4]Flower and Hayes, p. 378.