

Chapter 5

The Interactive Communication Environment: A Nexus of Audience and Systems Feedback

The choice is always the same. You can make your model more complex and more faithful to reality, or you can make it simpler and easier to handle. Only the most naive scientist believes that the perfect model is the one that perfectly represents reality. Such a model would have the same drawbacks as a map as large and detailed as the city it represents . . . depicting every tree, every pothole. . . . Were such a map possible, its specificity would defeat its purpose. . . .

**James Gleick, Chaos:
Making a New Science**

Schriver's description of the central role of the audience throughout the design process, combined with the feedback I had gathered using Senge's systems analysis, pointed to the fact that the *NSR*, though a good idea, did not incorporate the needs and goals of the students and faculty it was intended to serve. Students were unmotivated to participate because they saw no benefit in doing so, and teachers were hesitant to participate because of the potential of increased workload and uncertainty about what exactly was "excellent research writing" they were asked to identify and nominate for the journal. By the end of the spring 1998 semester I found that the difficulties of unmotivated students and hesitant teachers could not be overcome by simply doctoring the marketing approach, no matter how I tried, so I folded the project after its two years.

Through the process of working with the journal, in particular, by trying to understand how such a "good" idea went wrong, I discovered an intersection of audience analysis and organizational management that may be useful to anyone wishing to establish what is in essence an "interactive communication environment" — not a single document with multiple audiences, but rather a dynamic series of planned document exchange, with each document feeding off one the ones that precede it, a series of audience feedback, of multiple writers and readers feeding one another (hence "interactive"), in a self-perpetuating, defined disciplinary or organizational space (hence

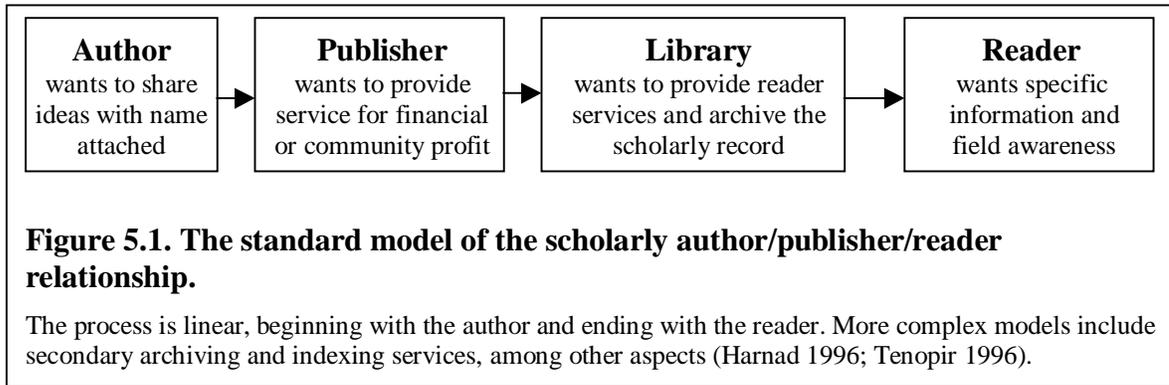
“environment”) that simultaneously attracts and disseminates communication. Examples include “serial” publications such as periodicals, listservs, and work/chatrooms, as well as other planned document exchange systems such as intentional series of revisions or updates of a document based on reader feedback over time (e.g., manuals periodically intentionally revised based on reader surveys). The importance of audience feedback in creating a new “organizational space” such as an interactive communication environment points to the wisdom of the “bottom up” rather than “top down” implementation of curriculum ideas of any sort, as advocated by both management theory and WAC principles (e.g., Walvoord 1996), and the importance of audience-driven rather than intuition- or classification-driven audience analysis as advocated by Schriver.

Below I summarize the lessons learned from the *NSR* experiment by presenting a model of an interactive communication environment as a cycle, in order to highlight the primary motivating factors of its intended participants. Identifying what factors may affect these participants points toward design and marketing approaches more likely to garner the participation needed to self-perpetuate an interactive communication environment such as the *NSR*. This nexus of modeling the audience and its motivation, using audience feedback and systems theory, points toward a union of management and technical communication that may lead to greater success for such projects in the future, and demonstrates the necessary connection between management systems and audience analysis.

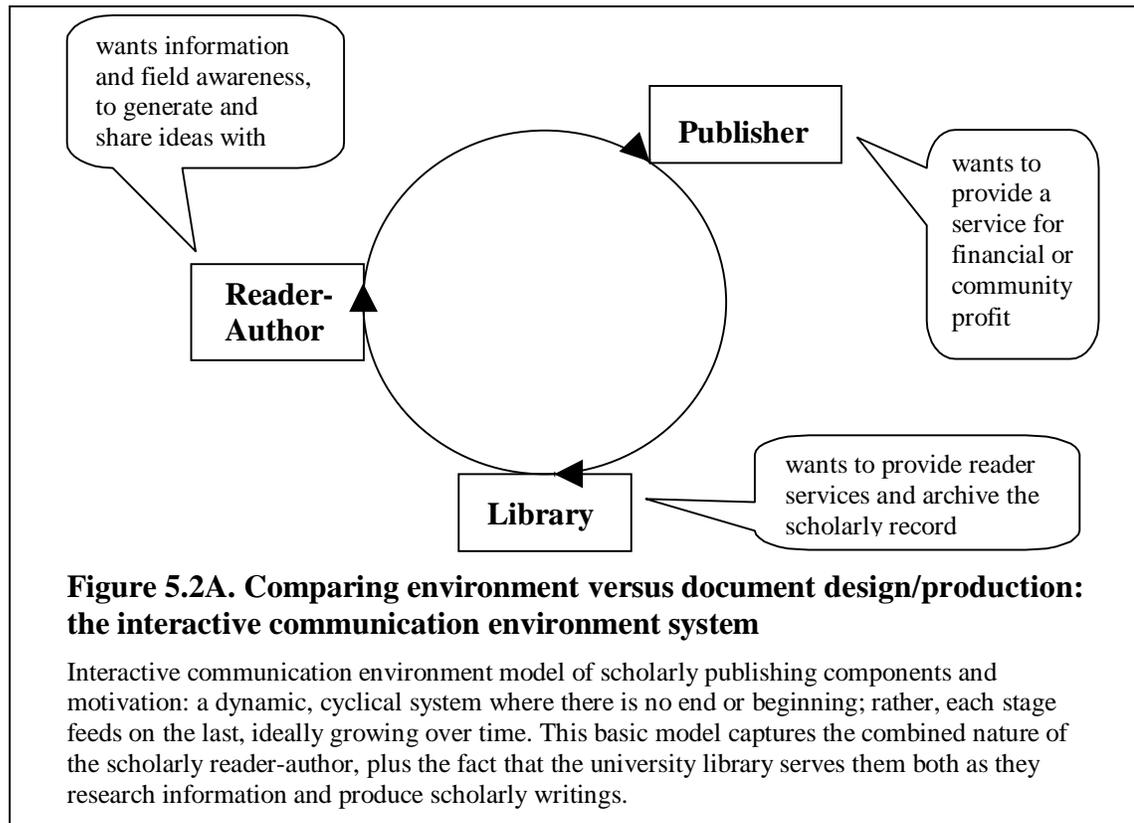
A. The Interactive Communication Environment

1. Modeling the Interactive Communication Environment

In the standard scholarly communication model, the main players are seen as being the authors, publishers, and readers: authors write a paper, publishers distribute it to readers, and readers receive the information (Figure 5.1). What this model conceals is an important aspect of the scholarly communication model, one that makes it incompatible with the different motivations that student-authors experience: scholarly authors read, to a large extent, so that they may teach and write, which condenses the reader/author

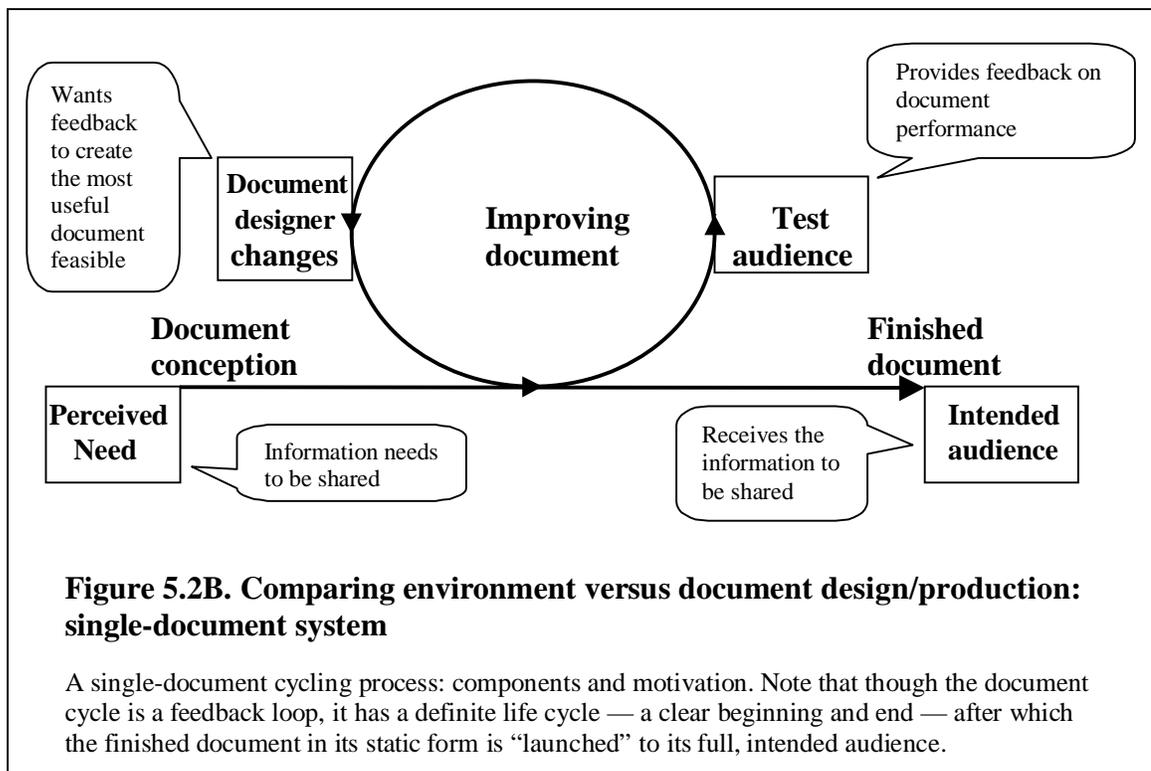


distinction. Adding to the dynamic model the concept that scholarly authors and readers tend to be one and the same group creates a dynamic “interactive communication environment” based on the co-identity of authors and readers (which closes the feedback loop and makes the publication process cyclical) and on dynamic, self-perpetuating systems (where each stage in the process leads to the next in a theoretically endless cycle of information exchange) (Figure 5.2A). This contrasts with relatively static, single-



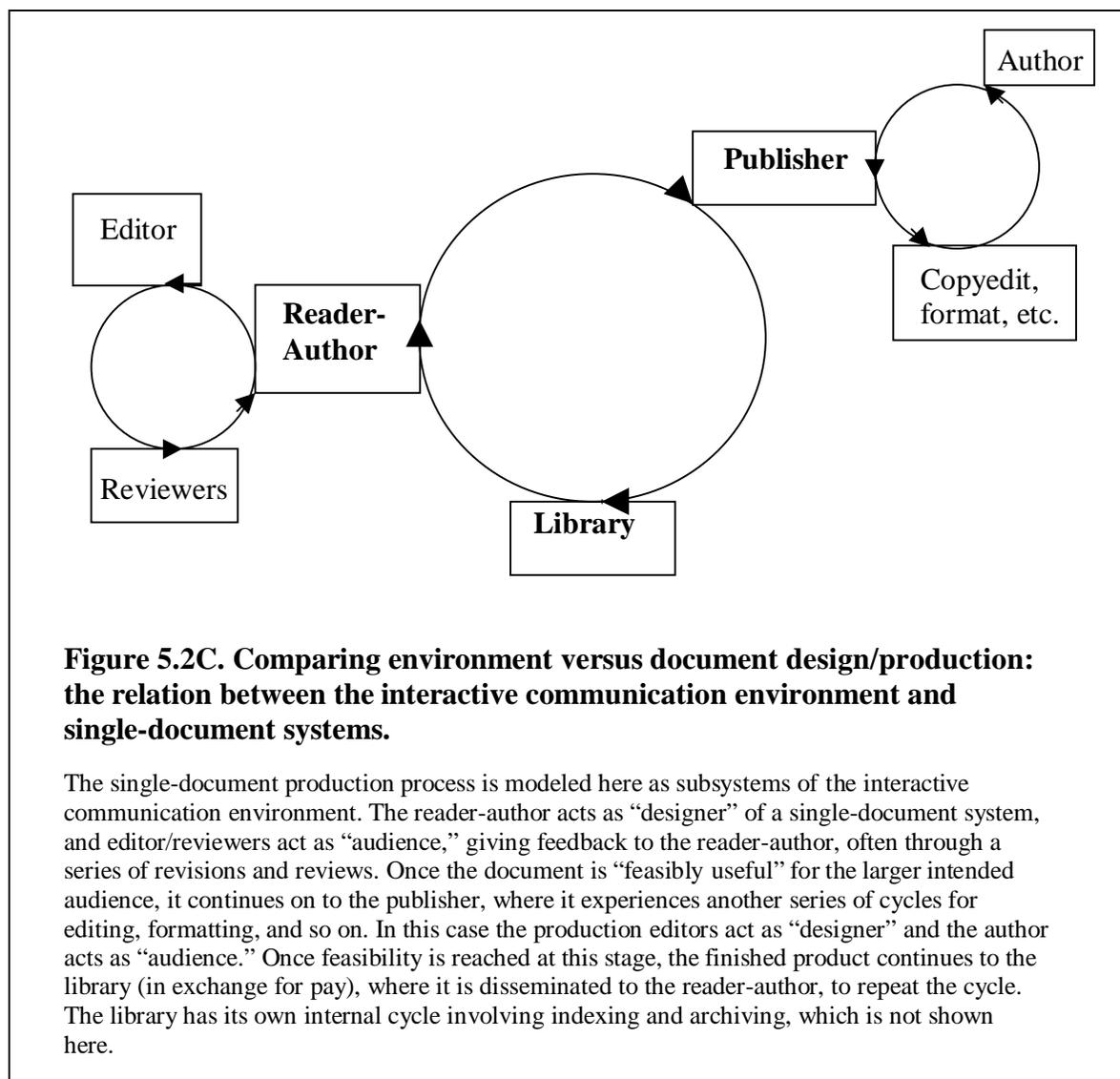
document concerns, in which document production has a finite life span regardless of how much the document is cycled among readers (Figure 5.2B).

Figure 5.2 compares an interactive communication environment, in which series of documents are created serially by participants, with the single-document feedback-driven audience analysis approach of Schriver (1997). Both systems involve feedback loops. Where they differ is in the beginning and end of the process. With an interactive communication environment (Figure 5.2A), apart from its inception, theoretically there is no beginning and no end; rather, earlier publications inspire and support later publications as reader-authors gather field-related information and transform this information into further publications, as is common in scholarly communication. The publisher and library facilitate this process by codifying and disseminating the scholarly writing. With single-document design and production, on the other hand (Figure 5.2B), the document has a beginning when a need is perceived and the designer begins to sketch out the document. Audience feedback is gathered, which shapes the document’s design through a series of interactions during the production process. At some point, the



participants determine that the document has grown as useful to the audience as feasible (based on cost and time constraints, etc.), and the finished document, in its final, static form, is distributed to the wider intended audience.

The single-document design process is a generic model that can apply to any document production (including intuitive and classificatory audience analysis, simply by replacing audience feedback with designer contemplation [intuitive] or comparison with literature [classificatory]). In the scholarly document production system (Figure 5.2C), the single-document model reflects the peer review process, with the audience comprising the editors and reviewers: once they determine the document meets their



standards (i.e., the document is “finished”), it is sent on to the publisher, who produces a document form sufficient for dissemination (e.g., a printed version or an HTML version). The publisher’s process can also be modeled generally by the single document system, with the author as the “audience”: a manuscript received by the publisher is edited, formatted, and printed, in each case (usually) the result being sent back to the author for approval (edit changes, format issues, color quality, etc.). The combination of the single-document and interactive systems creates a complex series of feedback loops, as modeled in Figure 5.2C, which shows the interactive communication environment as embodying multiple “audience” feedback (though the “audience” changes throughout the process), thus visually demonstrating how the single-document model can be considered a subsystem of the overall communication environment. A practical application of this more complex model is shown in Figure 5.3, a production flow chart for a scholarly journal that includes review and editing cycles, plus advertising procedures, all linked together in a cyclical fashion designed to increase the journal’s readership and submissions over time.

2. Identifying Motivation to Participate in the NSR

In order to create an interactive communication environment, the primary audience—the “motivating group”—needs to be identified and targeted for audience feedback during the design process, in order for the environment to develop into a self-perpetuating body of readers and authors. This differs from single-document design in that, with a single document, readers are asked to commit to a single, short-term investment of time and energy, even when readers become co-authors as they contribute to the design, wording, and content of a document. In an interactive communication environment, on the other hand, reader-authors are asked to make a long-term commitment to reading and contributing to the perpetuation of the environment, and so their level of commitment is far more critical.

In the interactive communication environment that is the scholarly journal, marketing can target readers heavily because readers tend to be the authors as well. Therefore, the focus of marketing an interactive communication environment aimed at

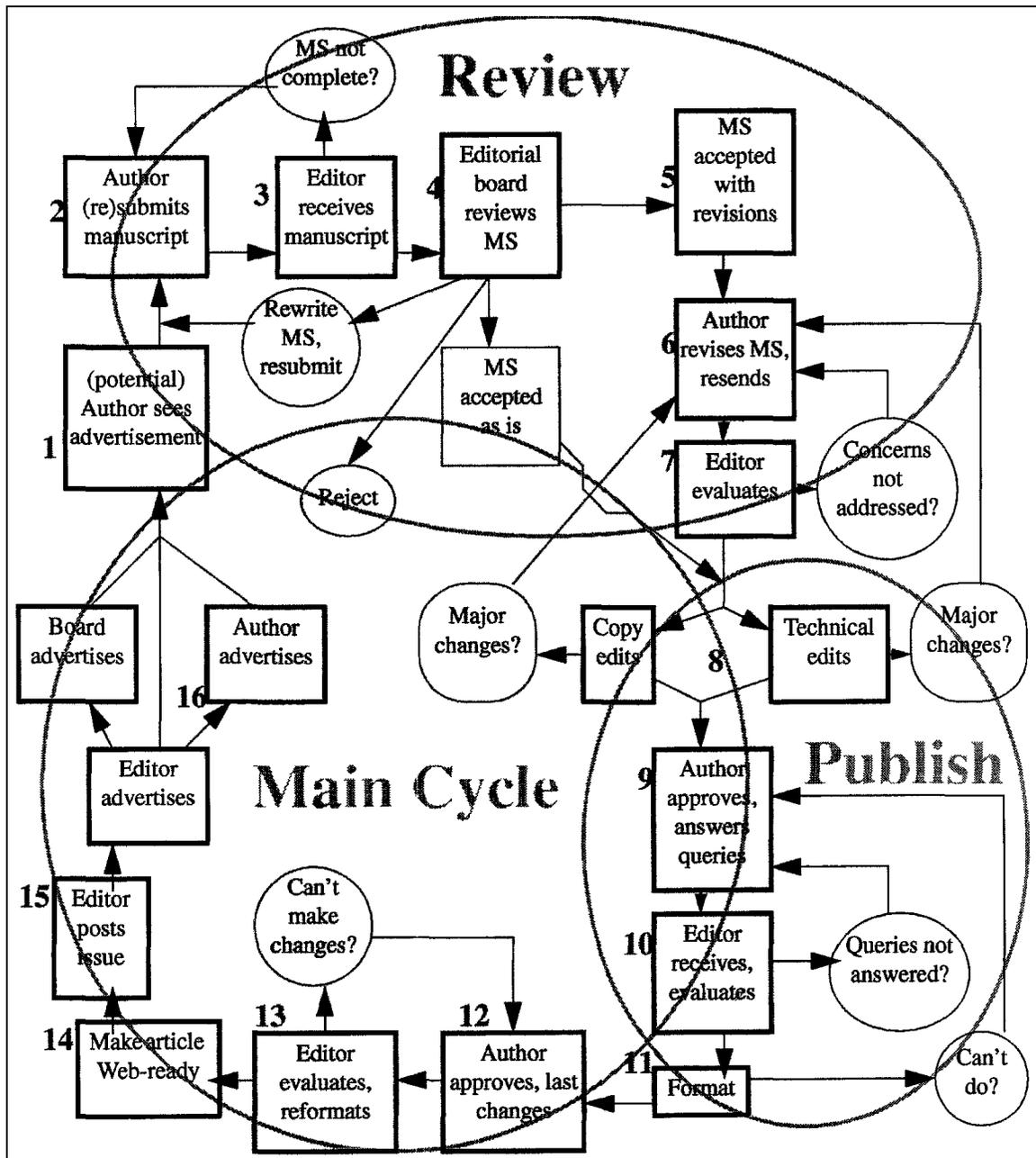


Figure 5.3. Online journal production flow chart: both environment and document production in action.

This is a more complex model of an interactive communication environment, including single-document subsystems for review, editing, and marketing. The system and subsystems modeled in Figure 5.3C are roughly outlined by the large circles. Note that there is no beginning and no end, but rather an endless cycle of article submission/review, production/publication, and advertising, which leads to further article submissions. (The library does not appear in this figure because the online approach of the journal aims at direct reader marketing/access—advertising takes the library’s position in this cycle.) [By Patricia J. Watson, Co-editor, for *Meridian: A Middle School Computer Technologies Journal* (<http://www.ncsu.edu/meridian/>), 1999.]

scholarly communication would be to demonstrate to *reader-authors* that fellow reader-authors value the publication (via strong readership and tenure value), and that the publication is accessible to reader-authors (via library subscriptions or free Internet access). Students, on the other hand, have a different motivation: they do not read in order to write, but rather read in order to pass classes, to get jobs. And they write in order to win their teachers' approval to pass those classes. They do not as yet perceive their role as writers (if that indeed will be the case), except in that their readers are teachers, not fellow authors.

Here is the crux of where the intuitive audience analysis approach failed: I confused the desire to publish ("sure, I'd like to have a great paper published") with the motivation to publish ("I perceive the reward to be great enough that I'm willing to use my valuable time to pursue publication among the many other pursuits I have"). Because students are motivated by an entirely different set of factors than are scholarly reader-authors, the focus of marketing would be not the student-authors, but rather the teacher-readers, who would incorporate the nomination process into their evaluation of the students' papers. Here is the crux of where the literature review, classificatory audience analysis failed: by focusing on the (unmotivated) student-author, rather than on the (motivating) teacher-reader, the *NSR* was seeking a pool of unlikely candidates. Where reader-authors are relatively self-motivated by responding to tenure concerns and the desire to share research, student-authors are not and require the motivation of teacher-readers to encourage and reward their efforts. Hence, faculty need to be motivated to contribute to the interactive communication environment (Figure 5.4). And here is where the GER debate became the major fly in the ointment. The teachers' fellow teacher-readers were not yet at a consensus as to what was worthy to label "excellent," thereby calling into serious question that entire aspect of the *NSR*. I should have given teachers the leeway to determine themselves (as a group) what they considered worthy of publication, if anything.

Thus, the interactive communication environment, as conceived for scholarly communication, did not apply to student communication. Rather, the model for the student interactive communication environment does *not* collapse the reader and author

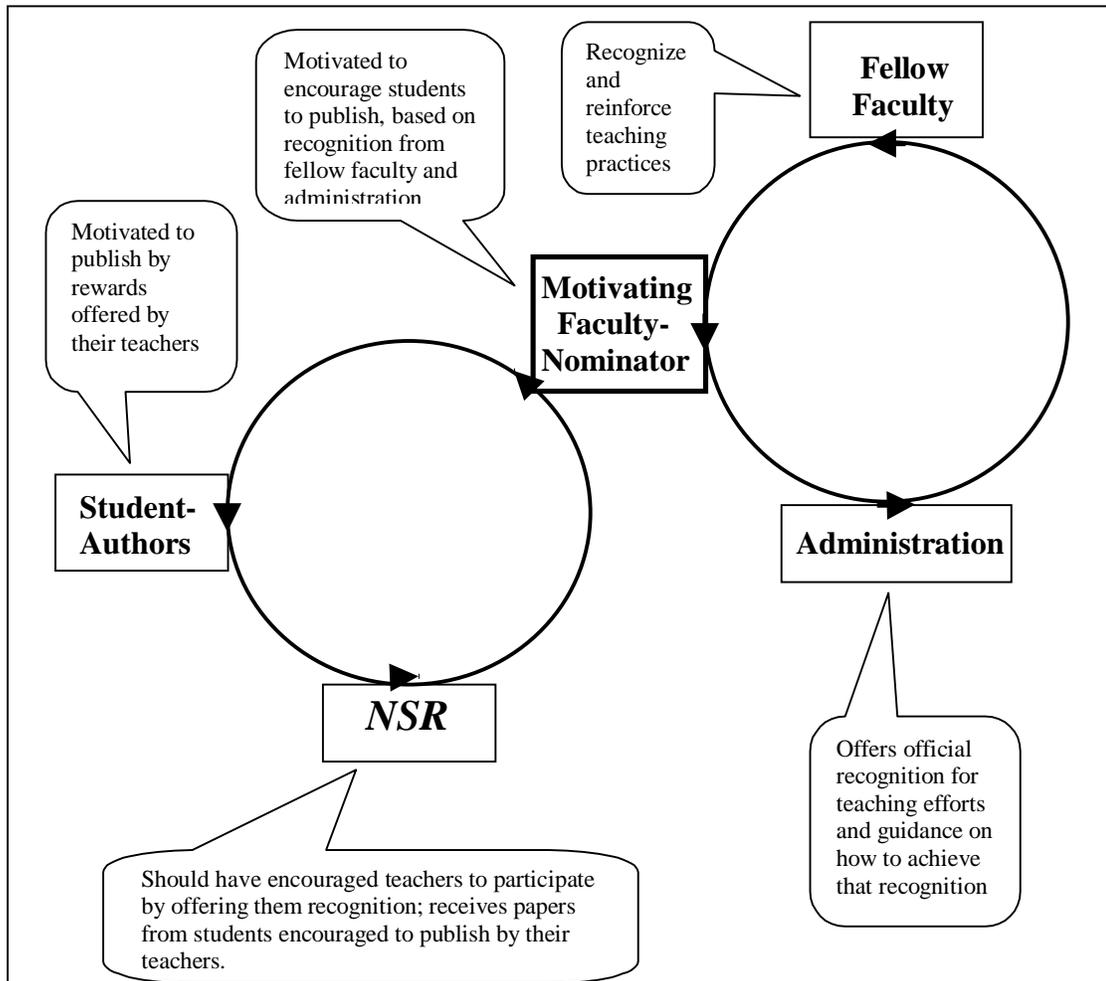


Figure 5.4. Interactive communication environment model of the student-faculty dynamic for NSR.

Students, as student-authors, are motivated by approval of their teachers, which in turn would lead to submissions to NSR. Faculty are motivated by the perceptions of their fellow faculty (within their own departments and colleges) and administration, including administrative decisions regarding WAC initiatives. Hence faculty, as the central unit of this model, should be the focus of marketing efforts, by appealing to their need for recognition by fellow faculty and administration.

as does the scholarly one. Since the main driving force comes from the teacher-readers, the primary motivating group that needs to be identified and targeted for audience feedback during the design process, in order for the environment to develop into a self-perpetuating body of readers and authors, is the teacher-readers, not the student-authors. Hence, it is the teacher who must feel good about the journal, the teacher who should be

involved in providing audience feedback throughout the journal design process, and the teacher who should be given the leeway to determine what is and is not appropriate for publication.

This analysis calls into question the wisdom of *NSR*'s policy of requiring two nominations from faculty, thereby taking away the primary teacher's freedom to self-determine the value of a class paper, as currently practiced (i.e., what constitutes an A paper). If I had involved teachers in the design process of the *NSR* I would have learned whether enough teachers felt that the review process was sufficient to provide students with publication experience, and whether publication experience was a valuable enough goal to warrant their support. Both of these issues are questionable, in light of the above analysis and the absence of such feedback in the journal's design. Also, *NSR*'s cross-disciplinary approach is also very questionable in light of this information: if teacher-readers are the primary audience, appealing to universitywide audience that does not yet share a definition of "excellence" was doomed to failure.

Three new undergraduate journals, launched in the spring of 1998, seem to respond to exactly the situation that I found. One journal is linked directly to a specific class, within a specific department and discipline, thereby limiting the need for cross-teacher, much less cross-department consensus. MIT's *Studies in Modern Quantum Physics: Student Papers in Physics 8.059* is an online journal that publishes all the final papers from the spring physics class, except those from students who left early for the summer (*Studies* 1998). Another undergraduate journal in print only is aimed at one specific department at one specific university. The *MIT Biology Undergraduate Journal* is a print journal that publishes papers from many biology fields, all within the Department of Biology. The journal emphasizes that it is for internal dissemination and for educational purposes only (*MIT* 1998).

The third journal is a cross-disciplinary, interuniversity publication. The *Journal of Young Investigators (JYI)*, whose conception addresses the same situation of excellent final papers otherwise destined for shelves or files as did the *NSR* (*Science* 1998), is an electronic undergraduate journal sponsored by such prestigious institutions as the National Science Foundation, the Burroughs-Wellcome Fund, *Science* magazine,

Swarthmore College, and Duke University. It has three subsections: physical and mathematical sciences, biology and biomedicine, and engineering (no humanities and social sciences section was included, thus limiting consensus to science and engineering). In the inaugural issue these sections had one, five, and no articles, respectively, regardless of the fact that they had the entire nation of universities to draw from (*JYI*, 1998). This indicates that *JYI*, too, without being tied to specific course material, and being cross-disciplinary, is struggling under the same limitations the *NSR* suffered. Perhaps *JYI* can benefit most from the lessons learned from *NSR*'s experiment: target the faculty with marketing and clear demonstration of the benefit *to the faculty* of encouraging their students to publish. Faculty in turn will motivate students to publish by providing them with incentive to do so (Figure 5.4).

Thus, it is clear from these models of interactive communication environments that the design of the *NSR* was completely inappropriate for its real audience, the faculty-readers, rather than the student-authors. Making it an appropriate interactive communication environment in which teacher-reader efforts could generate a self-perpetuating, beneficial medium for education would have required a complete redesign of the journal from the bottom up. This analysis more than any other issues documented in this thesis strongly demonstrates the value of feedback-driven audience analysis.

B. Using Systems Analysis to Gather Audience Feedback

As described in Chapter 4, Schriver's feedback-driven audience analysis has strong similarities to systems analysis (Figure 4.1). The common goal in both methods is to gather information from the parties involved and to use that information to affect the system to produce a "better product" (however "better" and "product" may be defined). Where they differ is that systems analysis is generally applied to systems while they are in use, to the here-and-now daily routine of an organization (factory, office, etc.). Schriver's feedback-driven audience analysis, on the other hand, is applied to the design of individual documents (instructions, handbooks, policy statements) before they are put

to full use, and therefore can fairly be considered a subsystem within the larger organizational system the document will be serving.

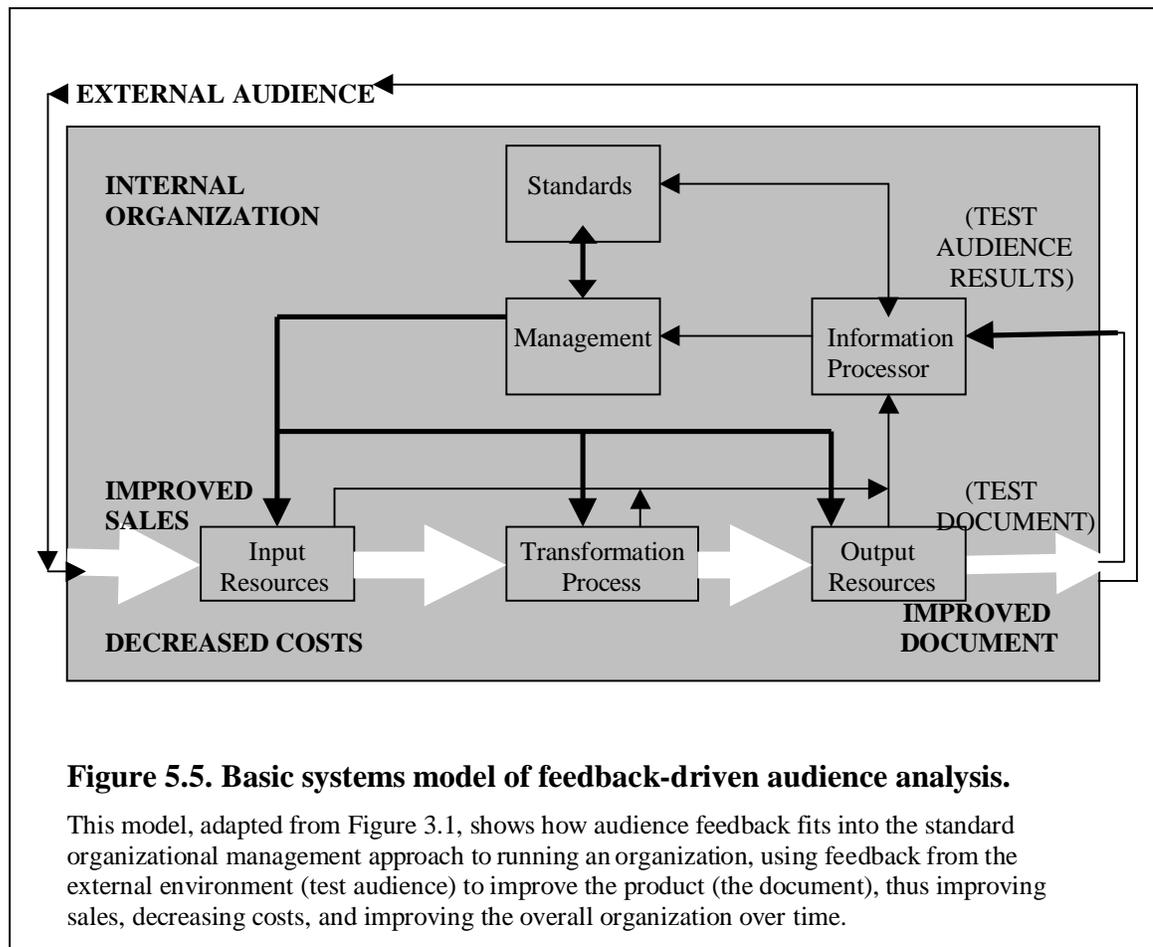
Feedback-driven audience analysis garners the same benefits of efficiency and leverage as does standard systems analysis as applied to the organization as a whole: mistakes can be avoided by catching them before they happen, and a better final product can be produced with fewer resources overall. No skilled manager would consider operating a production line without some type of management information system, yet skilled designers are often asked to create documents within their organizations without a “document information system” to provide the same type of information for the same reasons. But given the similarities of the processes, it may be possible for document designers to tap into the same information flow that managers do in order to achieve the same result: how well does the intended audience interact with the document? does it have the desired end result? Briefly trying sections of instruction manuals in a production line would be one example of this approach. The immediacy of the results of such a test would well reflect the immediacy of errors that might occur, and the cost involved, if such a manual were put into use untested.

But when the intended audience is not directly a part of the immediate organization but rather consists of end users of a product (e.g., as with software manuals) the delay in benefit should the manual be superlative (or the delay in organization cost should it not) often blinds the organization to the benefits of establishing a document information system. Users may mistake a poorly audience-adapted manual as a poor operating system and sales may thus decrease as the system earns an undeserved poor reputation. Or, users may make a multitude of help calls and thus increase customer service costs. Publishers putting a book on the market not well adapted to its intended audience may see a delay of years between changes in acceptance policies and decreased sales figures, often masking completely the cost of not using test audiences.

Figure 5.5 models in a classic systems analysis fashion how the quality of documents designed for use outside of the immediate organization, hence the value of investing in audience feedback, can affect the organization’s sales (financial resources). This figure is merely a more standardized, expanded systems analysis version of Figure

5.2B: the test document and the test results on the left of Figure 5.5 represent the test audience in Figure 5.2B, and the remainder of the boxes in the “internal organization” of Figure 5.5 represent the document designer’s task of processing the audience feedback in order to improve the document. The finished document in Figure 5.5 is then launched to the full (external) audience, and ideally the feedback process would continue by tracking the cost savings and/or increased sales garnered by the high-quality document thus produced (similar to Figure 5.2C).

In the case of an interactive communication environment such as a journal, chatrooms for employees (sometimes called “workrooms”), or listservs and chatrooms for people to share their similar interests, the application of systems analysis to gather feedback-driven audience input as part of the environment design process can be far more



critical than in either of the above-described cases (production line instructions, software or hardware manuals). The interactive communication environment has one major difference from the other two cases: defining who comprises the audience. For production-line manuals and computer and book sales the audience is identified as those who work on the production line, or purchase the software or hardware, or purchase books of a given genre (e.g., self-help books are purchased overwhelmingly by women 25 to 45). When constructing an interactive communication environment, however, the designer cannot be sure that the audience targeted by the environment actually will participate as active members, as its dynamic nature requires. Unless, that is, “feedback-driven audience system analysis,” the combination of audience analysis and systems analysis, is implemented to determine who the audience will comprise, what are their needs and motivations, how do they want to participate, and so on, and how these factors can help shape the organizational system that will serve them.

Another example of an interactive communication environment would be a document that incorporates planned revisions at regularly spaced intervals, not in response to “errors” but in an attempt to improve the document’s service to its readers. For instance, a software manual or package insert may include a reader survey asking for feedback on the document’s usability for the reader. Survey data are collected, and periodically the document is altered based on that feedback. The new document is then included in future packages or sets of software, again with a survey enclosed, and the process continues indefinitely. In this way the document would fit into the overall organization's system as illustrated in Figure 5.5 by converting the entire readership (at least those who send back the survey) into the test audience. Such an approach is common in gathering marketing survey data, for example, collecting customer demographics as part of registration cards. A similar approach to gathering audience feedback would fit into the same information-gathering system.

An interactive communication environment is voluntary, unlike the production line, and is treated like a direct product, unlike most computer manuals, which are indirect, support products for the direct software or hardware product that are revised only in response to “errors” in the document, not as a regular part of “product”

improvement. For this reason it seems fitting that the extreme case of *NSR*'s failure would make most clear the necessary connection between systems analysis, as practiced by organizational management for decades as a method of cost savings, and audience analysis, as eschewed by management because of cost outlay. It was under this mindset that I did not even consider investing the cost of my own labor to poll my intended audience more thoroughly, which would have revealed that I had completely misidentified them as the students, instead of the faculty who actually would have the power to sustain the interactive communication environment that was to be the *NSR*. Had I made such a small investment, in light of the effort I made later to understand its failure, I believe that my initial efforts would have been far better spent.

C. Conclusions

I have described in this thesis a two-year odyssey of designing and implementing an online journal for undergraduate research at NC State University during 1996–98. The original conception grew from my own and others' intuition and experience, supplemented by classification of the needs of an imagined intended audience. The failure of that intended audience to participate led me to examine the factors that affected their participation, by which I discovered through Senge's (1997) systems analysis that the actual audience — the undergraduate faculty and the administration — differed from the intended audience, undergraduate students. Schriver's (1990) concept of feedback-driven audience analysis explained the results, and pointed me to the nexus of systems theory and audience feedback that helped me to develop a model of an interactive communication environment that extends audience analysis beyond single-document design to the construction of a dynamic document system that relies on its audience for its continued existence. This systems approach clearly demonstrates the importance of management information tools to producing quality documents and document environments, and links that system to the success of the organization as a whole.

Awareness of the concept of an interactive communication environment, and the importance of document systems design in its success, I hope will be of great assistance to myself and others as we continue to work in the fields of technical and

scholarly document and environment design. The *Journal of Young Investigators*, as described above, and my own present work as editor of the online educational journal *Meridian*, can benefit greatly from understanding the importance of using audience feedback, and how helpful systems analysis can be in gathering that feedback. With such an approach, achieving success in the complex field of technical and scholarly documentation more closely approaches a simple series of interactive steps rather than a mysterious realm of trial and error where mistakes are often identified only after failure occurs.

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