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To the Graduate Council:

I am submitting herewith a thesis written by Meghan McCarty entitled "HTML and PDF Documents: A Study in Terms of Genre Theory." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in English.

Michael Keene, Major Professor

We have read this thesis and recommend its acceptance:

Mary Jo Reiff, Allison Ensor

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

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**HTML AND PDF DOCUMENTS:
A STUDY IN TERMS OF GENRE THEORY**

**A Thesis
Presented for the
Master of Arts
Degree
The University of Tennessee, Knoxville**

**Meghan McCarty
May 2004**

ABSTRACT

The purpose of this thesis was to determine, in light of current genre theory, if Hyper Text Markup Language (HTML) documents and Portable Document Format (PDF) documents are representative of separate and distinct genres. I chose a set of NASA documents, some published in HTML only, some published in PDF only, and one published in both HTML and PDF, as the focus of this study.

Using current genre theory and layout and design recommendations for print and HTML documents, I determined that HTML and PDF documents are not examples of distinct genres based on the NASA documents.

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INTRODUCTION

Search the web today and often you will be asked to make a decision regarding how you want to view a particular document. Most searches will retrieve a wide array of choices in terms of web sites, but lately, after you choose your site, you must also make another important choice. Will you view the document in HTML or PDF?

Why are you given this choice? The answer may seem simple at first. Of course, PDF documents are easily printed in their entirety, and HTML documents require no additional software. In *The Chicago Guide to Communicating Science*, Scott Montgomery says the following regarding PDF and HTML documents:

Many [websites] now offer articles in one or both of two text formats, which have become the most popular in use. These are HTML (Hyper Text Markup Language), the coded language of the web, allowing for the inclusion of hyperlinks and offering maximum flexibility in terms of text, but limited ability to handle mathematical symbols and formulas; and PDF (Portable Document Format), which resembles pages of a printed document and is largely “dead text,” easy and familiar to read but clumsy to handle and unable to take advantage of the Web’s most interesting and advanced features. Each format has its pluses and minuses. HTML can be decoded by any Web browser, but converting a digital file to this format can be a labor-intensive, time-consuming process. PDF documents are often large, require additional software to read, and cannot (yet) include hyperlinks, animations, or other sophisticated aspects. (193)

Montgomery discusses the obvious differences between the two, but is it possible that when computer engineers developed separate technology for PDF and HTML documents, there was something much more rhetorical at the heart of the issue? Is it possible that they were intuitively responding to something more important than creating printable documents that could include mathematical formulas versus documents with dynamic text and no requirements for special software?

Prior to enrolling at the University of Tennessee for my MA, I worked in the training department of a transportation company. My coworker was responsible for developing a computer-based training manual for the customer service department. The department's current manual contained over 400 pages and had been designed primarily for individuals who knew nothing about the job they were about to perform. Many associates found they needed a document that would enable them to reference policies and procedures while on the telephone with a customer. They wanted the same information contained in the training manual, but in a different format, one that would enable them to find the information they needed in a timely manner.

My coworker, who had the opportunity to streamline the daily tasks of 100 associates, was thrilled at the prospect of releasing the computer-based document. But when management saw the finished product, the computer-based manual was not released. My coworker had spent weeks producing a document that was just as cumbersome to use as the printed version.

The computer-based manual was nothing more than the original text document scanned into the computer. Instead of associates having to flip through countless pages

to obtain their information, they had to scroll through countless screens of text. My coworker had the opportunity to create an on-line version of the manual, which would break the text into small, readable chunks. The on-line version of the document should have responded to the need of the associates, but it did not. As a result, the computer-based manual did not accomplish what it was originally designed to do: make searching for information a quick and easy process.

In terms of this example, the difference between PDF and HTML documents goes beyond those of being printable versus those containing dynamic text. If you think of PDF documents as I had thought of the 400-page training manual and HTML documents as I had envisioned what associates were wanting, you will see that PDF and HTML documents contain a much larger difference: the manner in which they are read.

PDF documents are static and, therefore, contain a clear beginning, middle, and end. The author of a PDF document controls the order in which information is presented and the reader is often likely to consume the text in its intended order. HTML documents, on the other hand, contain dynamic text. The author of an HTML document presents links that can be opened in any order the reader chooses. In these documents, the reader, not the author, has control over the order in which the text is consumed. This shift in control obviously changes the manner in which the two types of documents are read but may indicate something much more significant.

The purpose of this thesis is to explore the difference between PDF and HTML documents on the web and, in light of current genre theory, determine whether PDF and HTML represent two separate genres. The associates in my example needed two separate

types of documents to achieve two separate goals: a print manual to guide them through the learning process and a dynamic manual to use as a reference tool. As will be seen in *Chapter 1: A Review of Current Genre Theory*, current genre theory questions the effect that audience need has on shaping genre to the extent that genre is a response to exigency. Based on my work experience and my familiarity with PDF and HTML documents on the web, I assumed that the two would represent distinct genres that respond to separate audience needs.

I envisioned professional discourse communities using PDF documents. This audience would be comprised of subject matter experts or those researching a particular subject. They would need content over flashy design and graphics, a document that would be easily printed for future study, and a document that had a clear beginning, middle, and end to lead them through the research.

On the other hand, I assumed that a completely different discourse community would use HTML documents. This particular audience would be more likely to be casual readers and would want more entertainment value with their information. They would also want to quickly access information. Perhaps they are already aware of the basic principles behind the content on the page and are just wanting to quickly find a piece of information, or perhaps they just simply do not have the time to skim an entire document and want to have more control of the text they read. Either way, my assumption based on the content and design of most HTML documents is that these users want to retrieve information quickly, have control over how they navigate through that information, and receive information in an aesthetically pleasing manner.

In order to address the question of genre in regards to PDF and HTML documents, it became clear that I would need to narrow my study. To look at PDF and HTML documents in general would be far too large a scope for this project. As a result, I chose to review NASA documents. These documents provided me with a specific type of discourse, technical reports, intended for a specific discourse community. The very nature of NASA, being such a scrutinized government agency exploring such dangerous territory, sets its technical reports apart from others. NASA's reports must communicate highly technical information, must incorporate a public relations component, and must educate citizens with varying levels of scientific knowledge. And it is because of this final requirement that I chose NASA reports for my study. I assumed that citizens with varying levels of scientific knowledge would naturally fall into at least two distinct discourse communities: those citizens whose career, interests, or political concern would cause them to seriously study NASA and its reports and those citizens who may be casually interested in NASA or one of their published findings. And I assumed that NASA was attempting to meet the needs of their distinct discourse communities by publishing their documents in distinct formats: PDF documents for the serious researcher who would want to know as much information about NASA as possible and HTML documents for the casual browser of NASA information.

The reader will see, based on the particular set of NASA reports used as the basis of this thesis, that my assumptions were incorrect. Based on the review of the documents, there is little difference between the PDF and HTML versions that would constitute a difference in genre.

Chapter 1: A Review of Current Genre Theory will review the literature of current genre theory and its theoretical groundwork. Based on the content of Chapter 1, it will become apparent that genre theory questions how the formal features of a text—in response to the needs of a particular discourse community—help to shape genre. In other words, do genres exist because texts contain certain formal features or because those formal features respond to a specific audience need? Current genre theory asserts that formal features of a text respond to a specific audience need, implying that it is readers, in part, that dictate genre. If a particular type of text does not meet the needs of its discourse community, eventually the needs of that discourse community will demand a new type of text. And often the new type of text that a discourse community demands has very little to do with content and everything to do with how the content is delivered.

My assumption was that NASA, when publishing reports in both PDF and HTML formats, was responding to the needs of varying discourse communities by delivering the content in two distinct forms, thus providing two genres of their technical reports. But in order for me to fully explore this possibility, it was necessary that I establish what the accepted guidelines for the layout and design of a successful PDF and HTML document are. In order to assert that the NASA technical reports published in PDF address a different audience need than the reports published in HTML, I needed to fully understand how the design elements of PDF and HTML documents differ. Anyone who has used the web can see that HTML pages have a different look and feel than PDF documents, but it was necessary that I support my intuition with sound theory. As a result, *Chapter 2: A*

Review of Layout and Design Guidelines will review the literature surrounding issues of layout and design of technical documents in print and HTML form.

In *Chapter 3: A Presentation of NASA's HTML and PDF Documents*, I will introduce each of the NASA technical reports that I chose as the basis of this thesis. I will present two reports published in PDF form, two published in HTML form, and two published in both PDF and HTML. Discussing each of these documents in terms of their purpose, intended audience, and layout will enable me to discuss the documents in terms of genre theory.

Chapter 4: Analysis of NASA's PDF and HTML Documents In terms of Genre Theory will take a close look at the differences and similarities between the NASA documents. After discussing genre theory in Chapter 1, reviewing layout and design theory of print and HTML documents in Chapter 2, and presenting the set of NASA documents that I chose as the basis of this thesis in Chapter 3, Chapter 4 will synthesize the previous chapters. Here I will discuss the NASA documents and the implications that their similarities and differences, particularly in terms of layout and design, have in terms of genre determination. In Chapter 4, I will identify why it is that the NASA documents that I review do not represent distinct genres.

The Conclusion will address the importance of the genre question on a much larger scale. Why is it important that technical communicators be aware of genre theory? If the NASA documents do not represent separate genres in their PDF and HTML forms, does this mean that PDF and HTML documents in general are not separate genres? And as PDF documents become more HTML-enabled with hyperlink capabilities, what will

the difference between the two forms be? Should they be considered separate genres at that stage?

I believe the answers to these questions are key to the success of technical communicators. Current genre theory, as will be seen in Chapter 1, is closely tied to those issues of audience and audience need that successful technical communicators grapple with on a daily basis. And as more publication occurs on the Internet every day, technical communicators must become aware of the rhetorical implications when choosing to publish a document in a PDF or HTML format.

CHAPTER 1: A REVIEW OF CURRENT GENRE THEORY

Genre theory, in terms of literature studies, contains a vast body of literature. It seems as though everyone from Aristotle, with his division of literature into the narrative, dramatic, and lyric, to Derrida, who attacks conventional laws of genre while also claiming that “a text cannot belong to no genre” (61), has discussed genre at some length. The purpose of this thesis, however, is not to discuss genre theory in terms of literature but in terms of rhetoric and, thus, technical communication. As a result, I will discuss genre theory specifically pertaining to literature only when it is immediately relevant to my discussion of genre theory within technical communication.

Before I begin discussing current approaches to genre, however, I feel it necessary to present the theorists who have contributed to today’s definition of genre. Current genre theory, as will be seen in “Genre Today” later in this chapter, rejects definitions of genre as being a rigid prescription based on textual formal features. Instead, genre theory is beginning to question what and who drives the features that comprise a genre, how those features come in to existence, and how individual genres help readers to achieve their text-related goals. Current genre theory accepts that genres are socially created and contain formal features that reflect rhetorical commonalities. This is a far cry from old definitions of genre, and it is based on the theories of Kenneth Burke and Kenneth Bruffee, who explore the social realm of

language, communication, and knowledge, and James Kinneavy, Lloyd Bitzer, and Richard Vatz, who focus on the aims of discourse and the rhetorical situations that shape discourse.

BACKGROUND THEORY

“Language as Symbolic Action”

Kenneth Burke, in his 1950 *A Rhetoric of Motives* and 1966 *Language as Symbolic Action: Essays on Life, Literature, and Method*, fused the study of rhetoric and human behavior. Referring to language “as symbolic action” and humans as “symbol-using animals,” Burke argues that language is a system of symbols for human expression. But Burke also argues the power that those symbols have. In the introduction to *Language as Symbolic Action: Essays on Life Literature, and Method*, Burke writes:

We hear of “brainwashing,” of schemes whereby an “ideology” is imposed upon people. But should we stop at that? Should we not also see the situation the other way around? For was not the “brainwasher” also similarly motivated? Do we simply use words, or do they not also use us? (Burke 6)

Here, it can be seen that Burke questions to what extent words themselves play a role in shaping communication and knowledge, but the argument that is more pertinent to this study concerns how the “symbol-using animals” use their symbols. Burke claims that “language is a species of action, symbolic action—and its nature is such that it can be used as a tool” (15). Language, then, unites us and enables us to achieve. Without the

tool of communication, everyday tasks would become much more difficult. Burke provides the example of a bird that cannot find its way out an open window. He comments, “What a simple statement would have served to solve his problem. ‘Fly down just a foot or so, and out one of those windows’” (4). So, it is language itself that enables man to act.

Social Constructionism

Kenneth Bruffee, expounding on Burke’s theory of language’s effect on knowledge and known for his contribution to the theory of social constructionism, writes about the social nature of language. In “Collaborative Learning and the ‘Conversation of Mankind,’” Bruffee states:

To the extent that thought is internalized conversation, then, any effort to understand how we think requires us to understand the nature of conversation; and any effort to understand conversation requires us to understand the nature of community life that generates and maintains conversation. (Bruffee 641)

In *Collaborative Learning: Higher Education, Interdependence, and the Authority of Knowledge*, Bruffee further discusses his theories of collaborative learning and says, “Collaborative learning assumes that knowledge is a consensus among the members of a community of knowledgeable peers—something people construct by talking together and reaching agreement” (3) and that “we construct and maintain knowledge not by examining the world but by negotiating with one another in communities of knowledgeable peers” (9).

Though Bruffee directly applies his theory to education and the concept of cooperative learning through communication, much of what he discusses can be, and is as will be seen later in this chapter, applied to communication in general. According to Bruffee, knowledge is not something that one person comes to on his own. Rather, knowledge is the culmination of conversations; it is achieved through the fleshing out of ideas and concepts, through gleaning information from multiple sources. Knowledge acquisition is a process, and just as the goal is achieved, there are new ideas and opinions to take into consideration. Therefore, while learning is certainly an individual process, knowledge acquisition is a social one.

Furthermore, in order for students to achieve knowledge in a classroom situation, they must be encouraged to take part in the “consensus;” they must be encouraged to engage with other students. Bruffee points out that collaborative learning “brings to the surface the relationship between the authority of knowledge and the authority of teachers” (7). If students are to socially construct knowledge, their learning process must take place in a classroom where authority is decentralized, where students discuss their ideas and opinions, and where those ideas and opinions are not judged for their accuracy, but for their potential to produce knowledge.

The Communication Triangle and Modes of Discourse

In his 1971 book *A Theory of Discourse*, James Kinneavy explores Aristotle’s rhetorical triangle and its wide use in terms of fields of study beyond rhetoric. For Kinneavy, “encoder,” “decoder,” “reality,” and “signal” are the foundation of not only

rhetorical study, but all communication acts as well. According to Kinneavy, the communication triangle is a “sound foundation” (18) for the study of English. While Kinneavy recognizes the possible complexities of the relationship among the elements of the triangle and acknowledges that different fields of study will approach these terms and their relationships in different ways, it is only necessary to look at the communication triangle in terms of discourse for the purpose of this thesis. See Figure 1.

In Level C of his levels of application of the communication triangle, Kinneavy argues:

The main components of the process [of language] are, as the communication triangle illustrates, an encoder, a language signal, an ability of the signal to refer to reality, and a decoder. The process makes it possible for any or all of these components to be emphasized in a given use situation. Language can therefore be employed with the stress of the process on the persons (encoder or decoder), or the reality to which reference is made, or on the product (the text which the discourse produces). There are consequently, person discourse, reference discourse, and product discourse. (Kinneavy 38)

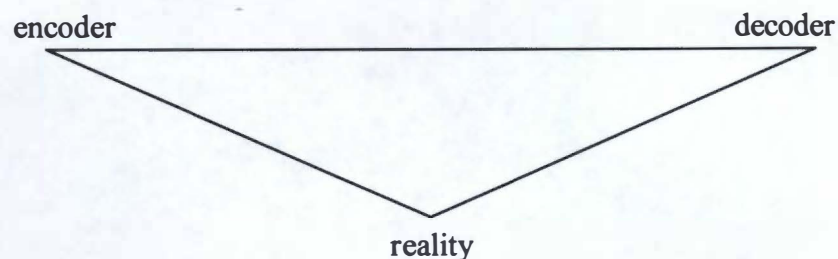


Figure 1: The Communication Triangle
Source: Kinneavy, *A Theory of Discourse*, p.19

Kinneavy explains that person discourse may focus either on the encoder or the decoder. Expressive use of language emphasizes the encoder, while persuasive language emphasizes the decoder. In reference discourse, “language stresses the ability of the language to designate or reproduce reality” (39) and product discourse refers to situations in which the text, or the signal, is meant to be appreciated (38).

Kinneavy’s purpose for discussing the types of discourse is to show that in each discourse type one of the facets of the triangle is more prominent; however, all are engaged at all times. For example, emphasis is, indeed, placed on the “decoder” in persuasive writing. This only makes common sense since the goal of persuasive writing is to convince the audience of something. But, obviously, it is important to note that the person doing the convincing is the “encoder,” the “signal” is the text through which the “encoder” tries to convince, and the “reality” is the factual information that the “encoder” may use to convince the “decoder.” Thus, while emphasis may be placed on the “decoder” in persuasive writing, all elements of the communication triangle are engaged. According to Kinneavy, the aim of any specific type of discourse cannot be achieved without the successful integration of all aspects of the communication triangle.

It is important to note, then, how Kinneavy defines “aim.” In his 1969 article “The Basic Aims of Discourse,” Kinneavy asserts that aim is “the effect that the discourse is oriented to achieve in the average listener or reader for whom it is intended” (107). In other words, discourse achieves its aim when the “decoder” receives the “signal” that the “encoder” intends to communicate in terms of some existing “reality,” or

in more current terminology, aim is achieved when the writer's intended message reaches the audience through her text.

And although Kinneavy does not focus much of his time beyond the communication triangle and its applications, he does acknowledge that no communication act takes place in a vacuum. Kinneavy acknowledges that discourse "is characterized by individuals acting in a special time and place" (22) and states, "beyond text lies the context of the situation of which text is a part" (23). This "context" that Kinneavy refers to has become known as the rhetorical situation.

"The Rhetorical Situation"

Lloyd Bitzer in "The Rhetorical Situation" argues that situation creates rhetorical discourse. For Bitzer, rhetoric is nothing more than a response to an event. He states that it is "clear that rhetoric is situational" and "the situation dictates the sorts of observations to be made; it dictates the significant physical and verbal responses." Bitzer goes on to assert that "so controlling is the situation that we should consider it the very ground of rhetorical activity" (5). Based on these statements, it is safe to say that Bitzer feels that situation is what creates rhetoric, but he also seems to argue the opposite in his article. According to Bitzer:

a work of rhetoric is pragmatic; it comes into existence for the sake of something beyond itself; it functions ultimately to produce action or change in the world; it performs some task. In short, rhetoric is a mode of altering reality, not by the

direct application of energy to objects, but by the creation of discourse, which changes reality through the mediation of thought and action. (Bitzer 3)

According to this, we can argue that Bitzer not only feels that situation creates rhetoric, but that rhetoric can influence situation as well, that the purpose of rhetoric is to generate a response to the very situation that created the need for rhetoric in the first place.

In order to more clearly define the relationship between situation and rhetoric, Bitzer names three “constituents” of every rhetorical situation: exigency, audience, and constraint. Bitzer argues that exigency, the most important constraint, “is rhetorical when it is capable of positive modification and when positive modification requires discourse or can be assisted by discourse.” In other words, the situation or need is a rhetorical one when it calls for change that may be acquired through the use of discourse. The example that Bitzer provides is Kennedy’s assassination. Following the death of President Kennedy, it was necessary that someone address the nation and ensure stability; it was necessary that a eulogy be prepared and delivered; and after the nation’s initial shock, it was necessary that congress be addressed. The situation, Kennedy’s assassination, created need for each of these rhetorical responses.

The second and third constituents are closely linked to exigency. Audience, the second constituent, is important according to Bitzer because “rhetorical discourse produces change by influencing the decision and action of persons who function as mediators of change” (7). It is key, then, that rhetors take into account the audience, whether real or imagined, that they will be communicating with, for it is this audience that will be able to respond to whatever need a particular situation has created. The

third constituent, constraint, is comprised of “persons, objects, and relations which are parts of the situation because they have the power to constrain decision and action needed to modify the exigence” (8). Although Bitzer does not spend a great deal of time explaining his notion of “constraint,” he does specify that when a rhetor “enters the situation,” his “personal character, his logical proofs, and his style” (8) become constraints. In other words, the rhetor’s approach can affect the audience’s reaction and decision as to whether or not to respond to the exigence or not.

So it is safe to argue that Bitzer not only claims that situation creates rhetoric, but that rhetoric should then, in turn, answer the exigence created by the original situation. But according to Bitzer, situation should not only create a rhetorical response, but it should create a “fitting response.” He argues “every situation prescribes its fitting response; the rhetor may or may not read the prescription accurately” (11). Therefore, according to Bitzer, the speaker in any given situation may or may not misread the situation. The speaker, with her unique rhetorical approach, may respond to the situation in the exact manner required by the situation, but the speaker can equally respond inappropriately.

It is the speaker’s contribution to a rhetorical situation that Richard Vatz focuses on in “The Myth of the Rhetorical Situation.” This article responds to Bitzer’s “The Rhetorical Situation” and argues, “no situation can have a nature independent of the perception of its interpreter or independent of the rhetoric with which he chooses to characterize it” (154). For Vatz, the speaker plays a much larger role in the rhetorical equation than she does according to Bitzer. Whereas Bitzer’s speaker is someone who is

able to read or misread the situations that create rhetoric, Vatz's speaker actually chooses those situations. According to Vatz, it is not situation that creates rhetorical responses but, instead, rhetors.

Vatz argues rhetors "translate" their choice of information into meaning; therefore, "meaning is not discovered in situations, but created by rhetors" (157). He attacks Bitzer's stance when he says, "the adjectives into which a 'situation' are communicated cannot be the 'real solution'; they must be a translation" (157) and more emphatically:

If you view meaning as intrinsic to situations, rhetorical study becomes parasitic to philosophy, political science, and whatever other discipline can inform us to what the 'real situation' is. If, on the other hand, you view meaning as a consequence of rhetorical creation, your paramount concern will be how and by whom symbols create the reality to which people react. (157)

Viewing rhetoric as Vatz does puts a great deal of responsibility on the rhetor and Vatz openly acknowledges this fact. "To view rhetoric as a creation of reality or salience rather than a reflector of reality clearly increases the rhetor's moral responsibility" (158). Because the rhetor chooses topics to discuss and how to address those topics, she has a great deal of power.

If Vatz were writing his article today, he may have used current political events to illustrate his theory. Although the United States government was recently facing a war with Iraq, many politicians claim that North Korea could, and should, have been a target of war as well. President Bush, however, did not pay rhetorical homage to the situation

in North Korea; he described Kim Jong Il, North Korea's leader, as a threat to regional stability and claimed the situation in North Korea could be handled diplomatically; whereas, he called Saddam Hussein an "evil-doer," linked him to Osama bin Laden, and called for war, even if it must be done unilaterally. As a result, North Korea, whether capable of mass destruction or not, did not seem to pose as great of a threat to the United States as Iraq did. Vatz would argue that North Korea was no less of a threat in actuality but appeared to be less of one because of the lack of rhetorical attention it received. As a result, President Bush, the rhetor, created a situation, the war in Iraq, based on his rhetorical choices, the focus on Saddam Hussein over Kim Jong Il. In essence, then, Vatz asserts that the rhetor creates the exigence.

Although Vatz does not acknowledge the connection, the idea of the rhetor's influence on the rhetorical situation is what Bitzer touches on when he discusses constraint. Bitzer argues, "when an orator enters the situation, his discourse not only harnesses constraints given by situation but provides additional important constraints—for example his personal character, his logical proofs, and his style" (8). As a result, Vatz's theories aren't as juxtaposed with Bitzer's as he may have thought, but there is no denying that Vatz places much more emphasis on the role of the rhetor than Bitzer does. For Bitzer, the rhetor can affect one of the three constraints that affect rhetorical response; For Vatz, the rhetor dictates rhetorical response.

CHALLENGING GENRE AS A CLASSIFICATION OF FORM

For many, genre theory is nothing more than a classification system based on formal features of a text. Much of this assumption comes from genre theory as it pertains to literature. Identifying a text as a novel, drama, or poem and within those genres the sub-genres of bildungsroman, five-act play, or sonnet is what many consider to be the work of genre theorists. To identify a text as a sonnet involves identifying certain formal features regarding that text, and as a result, genre theory runs the risk of becoming a checklist of form. Amy J. Devitt acknowledges this perception of genre theory in “Generalizing about Genre: New Conceptions of an Old Concept”:

The common understanding among too many scholars and teachers today is that genre is a relatively trivial concept, a classification system deriving from literary criticism that names types of texts according to their forms. (573)

Furthermore, Cyril Birch in *Studies in Chinese Literary Genres* says the following regarding genre:

Genre creates a comfortable saddle. The writer-rider once installed has the assurance that he will be in full control of his mount; the reader-rider who follows need not fear being bounced and shaken beyond endurance....Expectations of form fulfilled leave us freer to contemplate the total meaning. (qtd. in Gerhart 103)

In this case, Birch is not only acknowledging the possibility for genre theory to focus on form, but instead embraces that possibility. For Birch, the focus on the formal features of

a text is an important factor in the writer's ability to communicate and the reader's ability to understand.

It is, in fact, difficult to argue that form does not influence genre identification. Clearly, the formal features of an office memorandum are vastly different than those of a short story, a VCR user manual, or a love letter. But, in his review of Campbell and Jamieson's *Form and Genre: Shaping Rhetorical Action*, Thomas Conley also warns of the problematic nature of genre theory that falls into the trap of being nothing more than a classification system based on formal textual features. He argues:

The puzzle is that, by such generic standards, the best would be the one most like the last, or at least the ideal, work. Yet we know that this is not true. The best mystery novel is not the one most like the last. If it were, it would hardly be a mystery novel. (Conley 74)

Conley touches at the heart of what current genre theorists are discussing: what constitutes a genre is not necessarily a cookie-cutter set of documents that follow a rigid set of rules. In terms of Conley's example, for example, we would all agree that "the mystery novel" is a genre, but we would also argue that not all mystery novels are equal in terms of their form. But if form does not determine genre, what does?

Although genre classification does often rely on textual formal features for its determinations, form is not the only deciding factor of genre. And more importantly, formal features of text are a function of much larger issues at the root of rhetorical studies. Richard Coe, in "An Apology for Form: or, Who Took the Form Out of Process?" argues that "form is cultural, not neutral" (Coe 20). Coe states:

Rhetorical structures are in this sense the social memory of standard responses to particular types of rhetorical situations and subject matter. Like language, form is social. One function of discourse communities is to provide, prescribe, and prefer norms....In general, communication is most likely to succeed, to generate understanding rather than misunderstanding when writer(s) and reader(s) know and use the same forms. (19)

Coe encourages theorists to look at form, not as a rigid prescription of rules that exist for rules-sake, but rather as a reflection of the cultural and social needs of the discourse community that has created that form. Thinking of form in this manner forces us to ask questions such as: does a resume contain a heading with an applicant's information because that is what the resume genre dictates or because the applicant wants to readily display her information for her future employer? Should the standard freshman theme contain a thesis because all freshman themes are written that way or because the freshman theme serves as a platform for future academic writing that must be organized and focused? These questions, although they do involve form, involve much larger questions regarding exigence, audience, and purpose. And these are the very issues that current rhetorical genre theory explores.

GENRE TODAY

Current genre theory revolves around two separate schools of thought: the movement in Australia, known as the Sydney School, and the movement in North

America, often referred to as the New Rhetoric. While both schools of thought, which have evolved separately from each other, stress the social aspect of genre theory, the main difference between the two is “both the prescriptivism and the implicit static vision (unless genres are static, why should they be, and how can they be, taught?) expressed in the Sydney School project” (Freedman and Medway 9). While the Sydney School embraces the formal features of genre and incorporates them into their genre pedagogy, the North American movement celebrates the dynamic and evolving nature of genres based on their responses to social need. According to Carolyn Miller, for example, genre “does not lend itself to taxonomy, for genres change, evolve, and decay” (Miller 36).

The North American movement has distanced itself from the “form as determination” school of thought. Rather than consider form as being central to genre, it considers form in much the same way that Coe does. Form, then, is important to North American theorists not because of its rules, but because of what it tells us about a particular piece of writing, its author, its reader, its purpose, and its discourse community. Drawing from the theories of Burke, Bruffee, Bitzer, and Kinneavy, current genre theorists are concerned with the social and rhetorical aspects of genre.

Carolyn Miller

Carolyn Miller’s 1984 definition of genre, as set forth in “Genre as Social Action” and revisited in “Rhetorical Community: The Cultural Basis of Genre,” challenges those who view genre determination as relying on formal features of a text. Miller’s definition of genre has little to do with textual formalities and much more to do with the writer’s

intention, the audience's need, the situation, the exigency created by the situation, and finally the action performed as a result of the text. Just as Burke argues that language is a symbolic action, Miller asserts that genre is a social action. She claims, "a theoretically sound definition of genre must be centered not on the substance or the form of discourse but on the action it is used to accomplish" (Genre as Social Action 24). She also argues that the term genre "be limited to a particular type of discourse classification, a classification based in rhetorical practice" (27). In other words, Miller focuses on the social and rhetorical aspects of genre; form does not dictate genre, but the action that the text is used to accomplish does, and without the perfect necessary balance of audience, writer, purpose, and need to produce a particular text, the text cannot function in the manner, or genre, for which it is intended. This conception of genre is vastly different from prior definitions of genre that relied on form, and form alone, as determinant. Miller draws from Burke and Bruffee in terms of the social aspects of her definition and Kinneavy, Bitzer, and Vatz for the rhetorical aspects of her definition.

For Miller, genre is social. According to Burke and Bruffee, language is a social construct; thought is a social construct; and communication is a social construct. For Burke, it is through symbols or language alone that man is able to achieve anything and according to Bruffee, it is language that shapes knowledge. For both theorists, language, social in nature, is what enables mankind to achieve. Thus, it is not surprising that Miller extends their theories to include genres. Just as Bruffee says that communities create and maintain conversations, Miller accepts that genre "acquires meaning from situation and from the social context in which that situation arose" (37). More simply put, discourse

communities respond to needs within their communities by creating the necessary forms of communication to answer those needs. Those necessary forms of communication become genres when they meet the discourse community's needs and, as a result, become duplicated or, in Miller's term, *recur*. "Genre we can understand specifically as that aspect of situated communication that is capable of reproduction" (Rhetorical Community: The Cultural Basis of Genre 71).

And, according to Miller, the relationship between discourse community and genre is cyclical. Just as a discourse community defines genres according to its needs, genre can communicate a great deal about a particular discourse community. Reminiscent of Burke's question—"Do we simply use words, or do they not also use us?" (Burke 6), Miller claims that genres serve as "cultural artifacts" (Rhetorical Community: The Cultural Basis of Genre 69). In the same way that a physical artifact tells the story of a prehistoric society, a genre can communicate information regarding the discourse community who uses it. Because genres are socially constructed based on the needs of a particular discourse community, the genre should reflect the needs of the community.

As they are socially constructed, genres reflect the rhetorical needs of their particular discourse community. According to Miller "rhetoric provides powerful structurational resources for maintaining...social order" (Rhetorical Community: The Cultural Basis of Genre 75). Although Miller avoids discussing rhetoric in depth, she does imply throughout both of her articles that issues such as audience, purpose, and writer's role are central to social construct. As a result, the communication triangle is

key to understanding genre. As elements of the rhetorical triangle are changed, genre changes as well. And central to all of this is rhetorical situation.

As previously discussed, Bitzer argues that rhetoric results from situations and then should create a “fitting response” to the situation. In Bitzer’s theory, the situation instigates the rhetorical response; it dictates the response. While Miller does argue, like Bitzer, that rhetoric exists to encourage some sort of action, she claims that Bitzer’s theory relegates exigence to “an external cause of discourse” and situation to being “deterministic” (Genre as Social Action 28). According to Miller, these approaches create problems when viewing genre theory as social action.

Not only does Miller not accept Bitzer’s argument that exigence creates discourse, she also does not accept Vatz’s assertion that rhetors create exigence. Miller states that “exigence is a form of social knowledge—a mutual construing of objects, events, interests, and purposes that not only link them but makes them what they are: an objectified social need.” Miller goes on to say, “although exigence provides the rhetor with a sense of rhetorical purpose, it is clearly not the same as the rhetor’s intention” (Genre as Social Action 30). Thus, it is not the sole rhetor who dictates exigence when deciding which situations to respond to and how to respond to them, but it is the combined knowledge of a society that creates responses to situations.

“Exigence,” says Miller, “must be seen neither as a cause of rhetorical action nor as intention, but as social motive” (30). In other words, exigence provides the opportunity for discourse; it is not the sole instigator, nor is any individual. Exigence does not exist in a vacuum. Rather it exists and encourages discourse when society has

created a fitting response to a particular situation. Thus, “exigence is a set of particular social patterns and expectations that provides a socially objectified motive for addressing” (31) particular situations.

Thus Miller’s definition of genre, created with the help of Burke, Bruffee, Kinneavy, Bitzer, and Vatz, does not rely on form. Instead, Miller views genre as a dynamic classification that responds to the needs of its creators. And Miller is not alone. Since her groundbreaking article, many theorists have been studying the social dimension of genre and its rhetorical aspects.

Current Genre Theorists

A number of current genre theorists echo Miller’s social approach to genre. Bazerman, for example, in *Shaping Written Knowledge: The Genre and Activity of the Experimental Article in Science*, studies scientific discourse over the past 300 years. As a result, he is able to determine characteristics of the genre and observe how the genre has changed over time. Based on his research, Bazerman asserts:

Writing is a social action; texts help organize social activities and social structure; and reading is a form of social participation; thus, saying something about writing is saying something about sociology. (Bazerman 10)

Anne Freadman also expands on Miller’s new approach to genre in “Anyone for Tennis.” This metaphorical article compares genre to a highly evolved game such as tennis in which the game becomes ceremonial. In the same way that the player must contend with his style of play, his opponents’ style, their differing athletic ability, the crowd, and so on,

Freadman contends that genre involves the interplay of communication. In her metaphor, genre is not the game, but what Freadman refers to as “the playing of the game” (60). It involves timing, function, and framing. It is the continual conversation that is occurring between texts that creates what we refer to as “genre.” And though Freadman does not use the term, it is obvious that the play of the game is the social constructs that over time create genre.

And just as the social constructs reflect rhetorical needs in Miller’s concept of genre, other current genre theorists recognize the importance that rhetoric plays in genre determination. Amy Devitt, for example, writes “based on our identification of genre, we make assumptions not only about the form but also about the text’s purposes, its subject matter, its writer, and its expected reader.” She goes on to say “genre entails purposes, participants, and themes, so understanding genre entails understanding a rhetorical and semiotic situation and a social context” (575). According to Devitt rhetorical issues as basic as “wanting to address a particular audience and purpose constrains one’s choice of genre” (584).

CONCLUSION

No longer is genre theory about rigorous classification systems that dictate a document’s form; no longer is it a subject that should be open to ridicule by theorists who claim that it is too scientific and rigid. Carolyn Miller, based on the theories of Burke, Bruffee, Kinneavy, Bitzer, and Vatz altered the perception of genre theory forever.

Genre is now seen as a dynamic system that is socially constructed to meet the needs of its discourse community. It is not a prescribed form for a particular document, but rather genre is the answer to a social need. Thinking of genre in this manner allows us to answer my previous question: a resume contains a heading with an applicant's information because the applicant recognizes that is the best way to readily display her information.

This thesis seeks to ask a similar question: why does NASA publish its technical reports in both PDF and HTML file formats? And my assumptions were that genre theory would again answer the question: NASA publishes its technical reports in both PDF and HTML versions because each version addresses a specific discourse community whose needs dictate that particular document type. But to accurately address the question, I needed to establish that there indeed is a difference in the layout and design of PDF and HTML documents in general, which correspond with the differences I identified in the NASA PDF and HTML documents. My goal was to identify specific differences in terms of intended audience, audience need, and document purpose, which could account for the difference in document layout and design. Chapter 2, therefore, reviews layout and design guidelines of PDF and HTML documents.

CHAPTER 2: A REVIEW OF LAYOUT AND DESIGN GUIDELINES

Internet users come in all ages, genders, races, and income brackets (“Client Help Desk”; “Internet Users in the United States”), and they are coming in large numbers. According to Global Reach, a consulting firm specializing in attracting on-line customers, 174.6 million Americans actively use the internet (“Global Reach”). A similar marketing company, Personal Communication Systems, projects that as of 2005 the internet will have 765 million customers world-wide (“Personal Communication Systems”).

With such a wide variety of users, there come a wide variety of needs. Portable Document File (PDF) and Hyper Text Markup Language (HTML) technology, the two most widely used forms of publication over the web, have differing capabilities to address differing audience needs. PDF files enable users to view information online in its original print format. With this universal file format, documents such as brochures, publications, and registration forms maintain their original layout and design and are simply able to be opened and viewed over the internet. HTML, on the other hand, is a more dynamic medium, allowing users to have much more control over the document and, as a result, has its own design and layout possibilities. Thus, PDF and HTML documents involve different layout and design principles.

Because PDF files typically follow whatever design and layout guidelines there are for the particular type of document that they contain, they do not have guidelines in and of themselves. For example, a PDF file containing a journal article will conform to

the layout and design rules for its print counterpart. As a result, there is no body of literature referring to the layout and design rules of PDF documents. The particular PDF documents that I will review in Chapter 3 will be NASA reports. The first section of this chapter, then, will address layout and design guidelines for scientific reports and writing.

The second section of this chapter will review the literature pertaining to layout and design of HTML documents. HTML enables document designers to blend text, graphics, video clips, and sound in one comprehensive document. And because there are no reproduction costs involved, designers can use graphics and color more freely than they would in a print document. As a result, HTML, unlike PDF, documents do not mimic print documents. On the contrary, HTML is its own language with its own layout and design guidelines. This chapter will review the principles that currently guide HTML design.

GENRE PATTERNS OF TECHNICAL DOCUMENTS IN PRINT FORM

There is little to say in terms of layout and design principles for PDF documents, which, rather than have their own set of guidelines, follow the layout and design principles of their print counterparts. This section, therefore, will briefly discuss the layout and design principles of technical reports. The basic format elements to consider for any technical document are title page, table of contents, paragraph structure, white space, and headings.

Title Page

According to Greene and Ripley in *Writing by Design: A Handbook for Technical Professionals*, “An important business document...should have a cover” that “should reflect the document it introduces” (Greene and Ripley 84). And Greene and Ripley are not alone. Both *Reporting Technical Information* and *Technical Reporting Today* include a title page as a basic element of a formal report (Houp and Pearsall 200; Pauley and Riordan 237). And because a title page is the reader’s first impression of a document, it should be “well-balanced and attractive” (Pauley 156).

Table of Contents

In addition to a title page, experts agree that all technical reports should contain a table of contents. In Houp and Pearsall’s *Reporting Technical Information* (200) and in Pauley and Riordan’s third edition of *Technical Report Writing Today* (237), a table of contents is listed as one of the basic elements of a technical report. The table of contents serves to communicate “what the report contains and where to find it, and indicates also the organization, depth, and emphasis of the report” (Pauley 156).

Paragraph Structure

In terms of paragraph structure, experts recommend varying “paragraph length for greater effect,” and claim, “long paragraphs (more than 8 sentences) are difficult for readers to follow” (Greene and Ripley 84). Text, as a result, should include paragraphs of varying length and bulleted lists. According to Houp and Pearsall in *Reporting*

Technical Information, “one of the simplest things you can do to ease the reader’s chore is to break down complex statements into lists” (171). Lists separate dense text into smaller passages, making the reading of technical material easier. Because lists typically contain condensed text, the line of a list is easier for readers to consume than the sentences of a paragraph. And bulleted text does not only provide variety in terms of paragraph structure; it also provides needed white space on a page.

White Space

Based on my research, the experts agree that white space surrounding text helps to place emphasis on the text itself. Houp and Pearsall advise authors to “visualize the printed page. When it appears as an unbroken mass of print, it intimidates readers and makes it harder for them to pick out key ideas” (171). Thus the addition of white space when considering the layout of the page helps readers process the content of the text. And lists are not the only way to create white space on a page. Greene and Ripley mention line spacing as a way to increase white space. They say to “include lines without text” (84) and to “think about places where no text appears” because readers need “spacing to be able to comprehend your message” (87). And finally, Mathes and Stevenson argue that white space reinforces meaning by aligning like sections in a hierarchy. Vertical white space, for example, provides unprinted lines “used according to some consistent spacing pattern.” Thus, the inclusion of white space on the page helps reinforce the meaning of the text.

Headings

While white space helps convey meaning by grouping sections within a hierarchical relationship, so do headings. According to Greene and Ripley, headings “allow readers to skim through a report and comprehend its structure, and they enable readers to locate quickly key information” (84). The literature regarding layout and design of technical reports advocates using headings as often as possible to help readers navigate through text. In *Designing Technical Reports: Writing for Audiences in Organizations*, Mathes and Stevenson write “Too often writers do not use enough headings to signal divisions in their reports. They use headings to designate only the major segments. However, they should also use headings to signal divisions within segments down to the unit level and sometimes even the paragraph level” (163). And not only should writers use headings, but they should use meaningful, specific headings. Section titles such as Introduction or Conclusion convey no meaning and, therefore, are not useful to readers (Mathes and Stevenson 164; Souther and White 8).

GENRE PATTERNS OF HTML DOCUMENTS

The document and design guidelines for HTML documents are quite simple. In fact, based on my research, the design elements that usability experts are most concerned with fall into the following categories: readability, ease of information retrieval, and speed.

Readability

Readability of HTML documents is key to usability. According to recent studies, reading on a computer screen takes anywhere from 25 percent (Nielson 101) to 40 percent (Shriver 282) longer than reading on paper does. If a user is unable to read the computer screen, she will inevitably abandon the site. Readability problems within web sites are blamed for losing users and much more serious offenses such as causing “eyestrain, fatigue, [and] even headaches” (Sullivan “The Vision Thing”). Users do not have to accept web pages that cause these types of problems; they can simply choose a different site. So how can designers avoid readability problems on their web sites? Usability experts discuss typography, animation, and amount of text as areas that can improve website readability.

Typography

Typography issues for the internet are not much different than they are for any other medium. Well-chosen, simple fonts will make reading on-line text much easier for users. Unlike print documents, though, HTML documents cannot rely on a large array of fonts. Users will only be able to see fonts that are loaded into their personal computers. A designer may spend hours selecting “Tekton” because its graphic elements reinforce the tone of the web page only to have the user’s computer default to “Times New Roman.” As a result, designers should stick to basic fonts for text and save their “mood setting” text for graphic displays.

Designers are able, however, to choose between serif and sans serif fonts. On-line fonts can be either serif or sans serif (Shriver 505), but if choosing a serif font, designers should select one with square or slab endings. Because of pixel boundaries, delicate serifs may not display well (Shriver 507). Typically, users are able to view “Times New Roman” and “Georgia” as serif fonts, and “Helvetica” is a good choice as a sans-serif font (Shriver 508).

Font-Size

Font size is also an area that designers typically have control over and has a great deal to do with a site’s readability. Typically, the body text in print documents is between 10 and 12 point. This is too small for on-line text. Because of the distance that a reader is from the screen, possible lighting issues and screen distortion, and use of color in on-line text, on-line print should be a minimum of 12-14 point (Shriver 506-507; Nielson 125-126; Batschelet 25).

White Space

Another typography element that is as popular in on-line design as it is in print documents is white space. From Karen Schriver’s direct advice to “use it” (Shriver 511) to Charlie Morris’s decree that the “use of white space is one of the critical elements that separates artistry from amateurishness” (Morris “Timeless Typography”), experts agree that white space is necessary for readability. This should not be a surprise—white space has always been heralded for providing emphasis for too-cumbersome text and order for

too-busy design. Why would HTML documents prove to be any different? Clearly, when it refers to leading, borders around text and graphics, and breaks created by devices such as lists, white space is as effective on-line as it is in print.

Color Contrast

Additional issues that affect readability of typography are color of background color in relation to text color, background patterns, justification, and capitalization. Again, there are no surprises here. On-line text issues are similar to print documentation issues. Naturally, designers should use a high contrast between the colors of the background and the color of the text in their web pages (Morris “Have Your Colors Done”; Nielson 125-126; Waller “Usability Rules”) Nothing is more frustrating than trying to read pink text on a light green background or navy blue text on a hunter green background. This should be common sense, but anyone who surfs the web has seen at least one web site whose designer must love navy blue and hunter green.

Backgrounds

Another common web page problem is patterned backgrounds (Nielson 125-126; Waller “Usability Rules”). We’ve all seen the beautiful representations of repeating seashells, crests, cats, or whatever image the designer finds appealing. These annoying backgrounds obviously interfere with readability, but more and more companies are beginning to use large visual graphic representations on their homepages, and it is not rare to see text links embedded in the image. Although these patterned backgrounds are

much more graphically appealing and “high-tech” looking than their “wallpaper” counterparts, they can prove just as difficult to readers. Designers should avoid placing patterns and pictures behind text at all times.

Justification and Capitalization

Finally, both justification and capitalization affect readability. After arguing with my sister who is an architect with an interest in graphic design and a friend who designs web pages over whether text should or should not be justified (they both feel that text on web pages should be justified), I was pleased to find that the research supports what my technical communication background has taught me—text should be justified left, ragged right (Nielson 126; Schriver 509; Waller “Usability Rules”). Readability decreases when justified text creates artificial spaces between letters and words. In addition, using all capitalized letters decreases readability (Nielson 125; Morris “Timeless Typography”). If emphasis is needed in text, designers can create it with bold letters or larger fonts.

Animation

Obviously, typography issues can make or break readability. But designers can make all of the right typographical decisions and ruin the readability of a web page with one simple error—animation. As often as we see those irritating patterned backgrounds, we see a dancing cartoon, scrolling text, a waving flag, or blinking words. The authors unanimously agree on this point: animation kills readability (Schriver 515; Spool 89; Sullivan “Ten More Things to Avoid”; Nielson 143). According to Terry Sullivan, “there

is no way to juxtapose text and animation without having them compete with each other visually” (Sullivan “The Vision Thing”). Jared Spool even reports that during his study users “covered up [animation] with their hands so that they could read the rest of the text” (Spool 89).

Jakob Nielsen does concede that at times animation may be an effective tool. Nielsen says that if, for example, a designer wants to place emphasis on a line of text, he/she should use “a one-time animation (for example, text sliding in from the right, (growing from the first character, or smoothly becoming larger)” (Nielsen 147) and then leave the text static. Nielsen also briefly acknowledges the web site of an opera house, www.opera-de-paris.fr, for its use of effective animation. The web site provides users with a visual representation of the opera house and with a list of seats and prices below. As users scroll over a section of seats within the virtual opera house, the corresponding price is highlighted. Nielsen admits that simple animation effects such as this can improve usability (Nielsen 144). As designers become more familiar with JavaScript and its capabilities expand, further studies of effective animation will be necessary. I predict that designers will begin using animation as an instructional tool. Rather than writing step one, two, and three, designers will show users how to assemble new items or set the timer on the VCR through animated visual representations. With applications such as this, usability experts may become more willing to allow animation, but for now, “<BLINK> is simply evil” (Nielsen 143).

Text

Finally, the actual text affects the readability of a web site. It is important, at this point, to clarify what is meant by “readable.” While discussing typography and animation, it was clear that a readable web site is one that is easy to read from a visual standpoint. Effective typography and static text and graphics make the text easier to visualize and, therefore, read. But the definition of “readability” is not as clear once actual text is examined. Typically, the readability of a text is based on the difficulty level of the text itself. Tests such as the Gunning Fog Index and the Flesch-Kincaid Grade Level Scale attempt to measure the difficulty of text based on the words, sentences, and syllables. A text with, for example, long words and sentences would be considered more difficult to read than monosyllabic texts. Based on tests such as these, Jared Spool conducted a readability study of web pages. His study determined that “the less readable a site was the more users were successful with a site” and the more “users found the site authoritative, clear, complete, satisfying, and useful” (Spool 70). On the surface this does not make sense; however, Spool believes that those sites that were identified as difficult to read according to the readability tests were ones that were less likely to use conjunctions and articles. Often they were sites that relied heavily on bulleted lists to convey information. As a result, according to normal standards, those sites were less readable, but Spool determined that apparently web site readability should not be based on the same standards that printed texts are. After all, users do not read web pages in the same way that they read books or magazines. They do not read a web site from “cover to cover.” Instead, web users skim (Spool 70; Schriver 512; Nielson 104). Designers

should write for “scannability,” ensuring to use meaningful headlines, bulleted lists, and highlighted words for emphasis whenever possible (Nielson 104-106; Schriver 512).

Another way to shorten the length of text on any one web page is to use links to group information on separate web pages within a site (Nielson 112). Having less text on any given page allows users to skim and scan the page more easily and, thus, results in a more readable page according to web site standards.

Ease of Information Retrieval

In addition to readability, experts have determined that ease of information retrieval is essential to web site usability. Of course, when one searches the web, he/she is looking for specific information. It may be the score to last night’s game, the blue book value of a car, or that certain item on eBay, but whatever a user is looking for, he wants to find it as quickly as possible. With so many web sites available, finding the correct site is difficult enough, but that is just the first step to finding information. Once a user finds a site, he/she still must search for the page within the site that contains the necessary information. Considering that many large business sites contain hundreds of individual pages, continuity of design, effective navigation devices, and overall site organization are vital to making information retrieval easy for users.

Continuity of Design

Designers should, before anything else, plan their web site. Establishing unity of design throughout the site will ensure that users experience continuity between pages

(Morris “Good Page, Bad Page”; Waller “Usability Rules”; Sullivan “Mechanics of Reader-Friendliness”). Logos should remain similar from page to page, links should remain in the same place on every page, and color schemes should be maintained. Web sites that maintain design unity from page to page provide users with consistency. Consequently, users don’t have to search for the home link or the name of the page that they’re on. Instead, users are free to look for the information that they need.

Effective Navigation Devices

It is key that designers use navigation devices to break text into small chunks. Designers should never count on their users being willing to scroll through long pages of content (Waller “Usability Rules”). In fact, according to Jakob Nielsen, “only 10% of users scroll” beyond the information on the original page (Nielsen 112). Navigation devices will not only prevent the need for users to scroll, but also avoid the readability problems that come with long text. Some common navigation devices are frames, search boxes, and navigation bars, but some are more usable than others.

Frames allow designers to divide their pages into a number of sections. Each section can be controlled independently of the other sections. As a result, users are able to change the information that appears in one area of their screen while maintaining the information in other areas. None of the usability texts that I have studied endorse frames, and many of them instruct users to avoid them (Spool 22; Waller “Usability Rules”; Waller “No-No List”; Nielsen 86-87). According to Spool’s usability study, users encounter problems with frames when there are “subtle changes when one frame scrolls

to new content” (Spool 24). Because the entire page was not changing, users were often unaware that the frame had changed, especially when the content of the frames was text only. Users would continue clicking on the screen as if nothing had happened and eventually give up thinking that the server was down (Spool 24). Furthermore, Richard Waller claims that frames “confuse search engines and slow loading [time]” and make it difficult for users to print, page back, or bookmark (Waller “No-No List”). Nielson states it most simply with the heading to his section regarding frames—
“<NOFRAMES>” (Nielson 85).

Experts disagree when it comes to within-site search boxes. According to Jakob Nielson’s studies “more than one-half of all users are search-dominant” and will “go straight for the search button when they enter a website. They are task-focused and want to find specific information as fast as possible” (Nielson 224). As a result, Nielson endorses that a search option “should be easily available from every single page on the site” (Nielson 225). In contrast is Jared Spool, whose study found that users have difficulty with in-site searching. He reports only one-third of users using search (as opposed to Nielson’s one-half) and indicates that many of them had problems with the function. For example, users, according to Spool, don’t realize that search functions typically do not cover an entire site, but rather certain portions of the site. Spool compares, as a result, searching large sites to “using an atlas to find your way out of the woods” (Spool 50). Furthermore, he indicates that search results can be confusing. Web sites often return information in a seemingly random order, with filenames rather than descriptive titles, or in multiple instances (Spool 56). Because searching did not prove to

be successful for the majority of his users, Spool recommends that designers specify which areas of a site will be searched with the feature and improve search results.

Navigation bars, finally, seem to be the most common tool for navigating through a web site, especially if the site is not large enough to require a search feature. All of the literature that I studied endorses navigation bars as being an effective tool for users as long as a few simple rules are followed. First of all, recent research shows that users are more successful with navigation bars that appear at the top (and are mirrored at the bottom of a page) than with navigation bars that appear on the side of the page (Spool 26). When links are at the top, they are the first information that the user will view. If he does not want to wait for the entire page to load, he does not have to. If a site contains so many links that it is not possible to display all of them across the top, the most important ones should be top-displayed, while others can be listed on the side of the page.

The second rule for using navigation bars is to always offer text links as an option (Waller "No-No List"). Some users search the web without graphic capabilities. If a designer uses a graphic display to present the navigation bar, these users would be unable to view link names. Designers can use <ALT> tags so that users without graphic capabilities will see a text link in the place of the graphic image or can offer text links at the bottom of a web page. Either option enables all users to successfully view link names.

Finally, links should be descriptive and specific (Nielson 62; Spool 35). Nothing is more frustrating than linking to a page and waiting for it to load only to find that it does not hold the information you are hoping to find. Link names such as "Click Here"

do nothing to tell the reader what information lies within the page. While Spool advocates making link titles as long as they need to be to accurately describe their content (Spool 35), Nielson claims that “shorter link titles are better” and recommends that link titles contain no more than 80 characters (Nielson 62). Either way, both agree that the more specific the language that names the link, the higher the success rate of users will be. In addition, usability experts agree that links should be as few in number as possible while effectively chunking text into readable portions. Spool, for example, conducted a usability test in which users were given a list of questions to answer. He reports, “the more links on a page...the harder it was for users to answer our questions” (Spool 42). Designers should keep this in mind when they are tempted to link every page to the main page.

Effective Organization

Effective organization will prevent designers from having too many links on the main page and will make retrieving information easier for users. There are a number of organizational options for designers including linear, hierarchical, and network organizational structures. A linear organization has one page following the other. Users are able to go backwards and forwards from any one page, but they are unable to move from the third page in a site to, for example, the sixth page without going to the fourth and the fifth pages. A hierarchical organization is one in which the main page has links to pages which then link to other pages. The home page, in this system, is the “main” or most important page. Finally, the network structure puts all pages within a site on equal

standing. “All pages are interconnected, with no page being central” (Batschelet 154-155). Experts agree that it is important that web sites have a clear organizational design to increase usability; however, according to Spool’s usability test, “users apparently don’t think about the site structure at all. Instead, they continue on an exploratory path through a site until they find what they’re looking for” (Spool 20). While this may be true, effective organization within a web site probably works in the same way that unity of design or accurate link names work—when it is working correctly, users are unaware of it. The process becomes seamless. But take the organization away, and users will notice problems immediately.

Speed

Speed is the final element that has been researched in web site usability. This category may be the most important because, unlike the others, speed (or lack of it) can prevent a user from ever seeing your site. Take too long to load and lose a potential user. According to Robert Miller, an expert on response times and computers, “ten seconds is about the limit for keeping the user’s attention focused on the dialogue. For longer delays, users turn to other tasks while waiting for the computer to finish” (Nielson 44). Unfortunately, a designer does not have ultimate control over the speed at which a user will view his/her web site. Factors such as the quality of the site’s server, the server’s connection to the internet, the user’s connection to the internet, and the speed of the user’s browser and computer all affect the time that it takes for a web site to load (Nielson 45). A designer, however, can increase the likelihood that his/her page will load

quickly with one easy step--limiting graphics (Waller "No-No List"; Sullivan "Ten More Things to Avoid"; Nielson 134).

There are a number of ways that designers can limit their graphics. Simply excluding images that serve no purpose but decoration is the easiest way to decrease graphic content. It may also be the best way if Jared Spools' study is accurate. According to him, "when users thought an image would have interesting content, they would wait for it to load. When they thought the image was purely decorative, they were less patient" (Spool 86). If users do typically ignore "decorative" images, then they serve no purpose but to slow the web site response time. Designers can also reduce graphics by optimizing their pictures (Waller "No-No List"; Sullivan "Ten More Things To Avoid"). A process that takes only a few seconds in a graphic editor can save excessive amounts of loading time. While optimizing, designers may consider resizing their images too. A slightly smaller image will typically not sacrifice the aesthetic appeal, but it will increase loading time. Finally, usability experts urge designers to avoid splash screens (Waller "No-No List"; Nielson; Sullivan "Ten More Things to Avoid"), a graphically appealing page that users see before coming to the home page. The page, while entertaining, slows the reader from obtaining desired information and, thus, sabotages usability.

CONCLUSION

Obviously, the design and layout guidelines of print documents, which are in turn the guidelines for their PDF counterparts, and HTML documents are vastly different.

While theorists are concerned with the elements of technical reports in terms of PDF documents, they focus on how to handle dynamic features such as images, links, and animation in HTML documents. If we accept the genre theory of Coe, Miller, Bazerman, Freadman, and Devitt, the fact that there is a difference in the design and layout guidelines for these two formats is reason enough to constitute PDF and HTML documents as distinct genres. The very fact that they have varying layout principles indicates that the two formats respond to the needs of distinct discourse communities; however, for the purpose of this thesis, my aim was to determine whether the two constitute distinct genres in terms of NASA technical reports. Chapter 3, then, addresses the NASA reports in terms of their purpose, intended audience, and layout.

CHAPTER 3: A PRESENTATION OF NASA'S HTML AND PDF DOCUMENTS

In the previous two chapters, I have discussed genre theory and design principles of both print and HTML documents. This chapter will depart from theoretical discussion and focus on a close reading of NASA technical reports that have been published on the web. The purpose of this chapter is to present the PDF and HTML documents that I will be discussing in future chapters.

This chapter focuses on the NASA documents that I chose as the subject of this thesis. I reviewed both PDF and HTML versions of NASA technical reports. NASA published the following technical reports as PDF documents:

- *Enhancing Mission Success—A Framework for the Future: A Report by the Chief Engineer and the NASA Integrated Action Team*
- *NASA FBC Task Final Report*

On the other hand, NASA published the following technical reports as HTML documents:

- *Spinoff 1998*
- *NASA Strategic Plan: 1998 NASA Policy Directive (NPD)-1000.1*

Finally, NASA made the decision to publish the following report in both PDF and HTML format:

- “NASA Strategic Enterprises”

The major question of this thesis is whether the format of the document alters the manner in which its intended audience, or discourse community, will use the document, which thus affects the genre. Keeping in mind Carolyn Miller's definition of genre as being socially driven to meet the needs of its discourse community, there are two possible scenarios that would support my assumption that the PDF and HTML versions of the NASA documents are representative of distinct genres:

1. If the NASA documents achieve the same purpose and meet the same intended audience through PDF and HTML versions, it would follow that the two versions meet two different needs of one discourse community, and therefore, constitute distinct genres.
2. If the NASA documents achieve the same purpose and meet the needs of two separate audiences through the PDF and HTML versions, it would follow that the two versions meet the needs of two different discourse communities, and therefore, constitute distinct genres.

As a result, I will present NASA's PDF and HTML documents in terms of their purpose, intended audience, and layout. Identifying these areas of individual documents will enable me to discuss the PDF and HTML versions of the NASA documents in terms of genre theory in chapters 4 and 5.

PDF DOCUMENTS

In the introduction to this chapter, I introduced the following technical reports published by NASA in PDF form:

- “Enhancing Mission Success—A Framework for the Future: A Report by the Chief Engineer and the NASA Integrated Action Team”
- “NASA FBC Task Final Report”

In this section, I will discuss these PDF documents in terms of their purpose, intended audience, and layout.

Purpose

In both *Enhancing Mission Success—A Framework for the Future: A Report by the Chief Engineer and the NASA Integrated Action Team* and the *NASA FBC Task Final Report*, NASA explicitly identifies their purpose. The *Enhancing Mission Success Report* discusses the NASA Integrated Action Team’s findings after reviewing Faster, Better, Cheaper (FBC) reports and the *FBC Task Final Report* “summarizes the results of the NASA FBC TASK conducted from July 1999 through February 2000.” Thus, the documents have similar purposes: to discuss the FBC initiatives. Where the two seem to diverge is in their intended audiences.

Intended Audience

NASA’s FBC Task Final and Enhancing Mission Success Reports address different audiences as can be seen by closely examining the language of the two

documents. The FBC Report addresses an internal NASA audience, whereas the Enhancing Mission Success Report addresses an external one. The following paragraph, taken from the third page of the NASA's FBC Task Final Report, provides a clear picture of the document's intended audience:

So, FBC is not resting on your laurels, not just accepting past ways without good reason. It's questioning the reason for every practice, it's continuously looking for improvement, it's stepping out with new methods, new technology, and taking prudent risk. FBC is not taking undue risk by taking shortcuts under pressure around important rests and qualification." (Page 3)

Clearly, this paragraph is explicitly intended for NASA engineers and employees. The pronoun "your" in the first sentence makes this clear. Furthermore, the jargon acronym "FBC" is never fully defined in this document. Because the intended audience is NASA engineers, there is no reason to define it; they will all recognize "FBC" as NASA's truncated term for its new over-arching work philosophy: Faster, Better, Cheaper. Finally, the document's "Task Objectives," clearly identify this document as having been written for an internal audience. The objectives are listed as follows:

1. Define FBC and develop "rules of engagement"
2. Identify major challenges for FBC
3. Identify what is most important for the future of FBC
4. Propagate FBC throughout NASA identifying more effective Center-to-Center teaming arrangements

5. Provide recommendations in response to 1. through 4. above
6. Identify good examples of FBC
7. Provide metrics for measuring FBC

These objectives, which focus on improving FBC, are clearly targeted at those people who have the ability to improve FBC. This document, then, based on its language and content, targets an internal audience. NASA's "Enhancing Mission Success—A Framework for the Future: A Report by the Chief Engineer and the NASA Integrated Action Team," however, assumes an external audience.

While this document also surrounds the Faster, Better, Cheaper projects, unlike the *FBC Task Final Report*, it is written in a much more formal tone. Discussing the findings of the NASA Integrated Action Team, the Executive Overview of this document contains passages such as:

As first introduced in NASA in 1992, FBC reflected a management approach that intended to stimulate innovative development and application of technology, to streamline policies and practices, and to energize and challenge a workforce to continue to safely and successfully undertake bold new missions in an era of diminishing resources.

This is clearly a departure from the direct pronoun usage of the *FBC Task Report*, and it can therefore be assumed that the intended audience of this document is an external one. Interestingly, however, there does not seem to be the same effort to use a positive spin or propaganda-like rhetoric. In this document, NASA admits that under FBC "NASA reduced its civil workforce by 24 percent from Fiscal Year 1993 through Fiscal Year

1999, causing both a loss in corporate knowledge and a substantially increased workload on the remaining employees.” (Page 6) In the *Enhancing Mission Success Report*, statements such as “As with any major human endeavor, there have been successes and failures in the stress and strain of venturing onto new ground” (Page 2) and “However, of all the hundreds of people interviewed, outside and inside NASA, no one said we should turn back. All realized that NASA must continue to improve its performance if NASA is to stay a world leader” (Page 2) create a document full of propaganda. It is interesting to note that the document intended for an external audience contains less propaganda than the document written for an internal audience.

Layout

Both documents, *Enhancing Mission Success—A Framework for the Future: A Report by the Chief Engineer and the NASA Integrated Action Team* and the *NASA FBC Task Final Report*, contain a fairly traditional layout and design approach for technical reports. I looked at both documents in terms of sections, organizational approach, length, and word count.

The *Enhancing Mission Success* report is divided into two major sections: Executive Overview and the NASA Integrated Action Team Action Descriptions, which are then divided into smaller sections. The Executive Overview and the NIAT Action Description contain 6 sub-sections. In addition, there are the following sections: Other Recommendations Assessed, Conclusions, and Appendices A, B, and C. The report, containing 82 pages of text, has a title page, signature page, and detailed table of

contents. Based on the first three pages of text in the Executive Summary, there are 13 full paragraphs containing on average 77.7 words each. Refer to Figure 2 for a screen shot from the Executive Summary. Based on this screenshot, it can be seen that the *Enhancing Mission Success* report contains a great deal of text, which is in traditional paragraph form.

The *FBC Task Report* follows a very similar layout. Like the *Enhancing Mission Success* report, it is divided into major sections. The report contains the following headings: Preface, Introduction, Background, Major Challenges for FBC, What is Most Important for the Future of FBC, Propagate FBC Throughout NASA, On Center Teaming, and Recommendations. Many of these headings, then, are broken further into sub-headings, numbered lists, or underlined passages for emphasis. This particular report does not contain a table of contents, but at 18 pages total in length, this report is short for

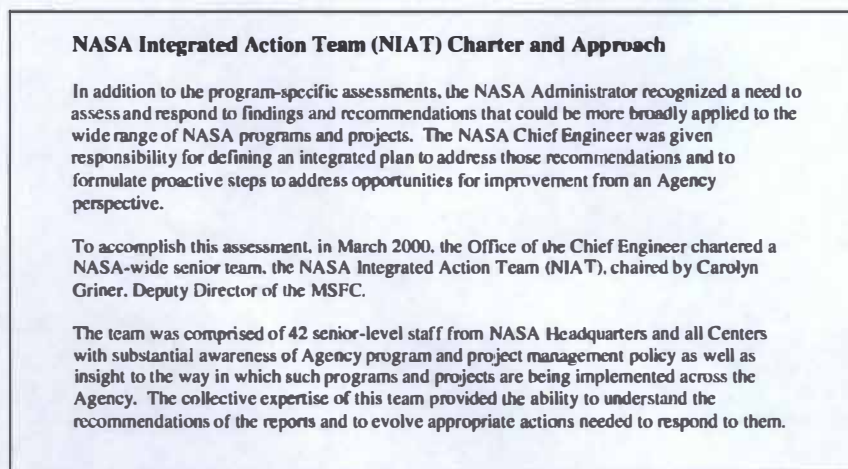


Figure 2: Text from NASA's *Enhancing Mission Success* Report
Source: <http://history.nasa.gov/niat.pdf>

NASA and probably does not require a table of contents. Based on the first three pages of text containing 20 full paragraphs, the average paragraph is 50.45 words long.

HTML DOCUMENTS

Having discussed the documents that NASA chose to publish in PDF form, I will now discuss the documents that were published in HTML. NASA published both *Spinoff 1998* and *NASA Strategic Plan: 1998 NASA Policy Directive (NPD)-1000.1* in HTML form. This section will discuss both reports in terms of their purpose, intended audience, and layout.

Purpose

Just as the documents published in PDF form explicitly state their purpose, so do the documents published in HTML. *Spinoff 1998* is an annual publication whose goal is to “demonstrate...the variety of projects and programs resulting in transferrable (sic) technologies that may be adopted by industry.” The introduction of *Spinoff 1998* goes on to say, “This publication is one true measurement of NASA’s commitment and technique to transfer all applicable technologies through the employment of modern approaches and outreach concepts—the new way of doing benefits” (<http://www.sti.nasa.gov/tto/spinoff1998/intro98.htm>). The *Strategic Plan* claims that it describes the way in which we will implement our mission, answer the questions, and achieve our future goals. The Plan also identifies our customers and articulates where we

are going and why. Most importantly, it provides a common basis for the Administration, Congress, and NASA's management to make decision regarding the implementation of our programs and the deployment of the resources needed to turn the Plan into reality. (www.hq.nasa.gov/office/nsp/outlook.htm)

Intended Audience

Based only on the language used in the reports published in HTML, it appears as though the two documents are targeted at separate audiences. However, NASA is attempting to reach an external audience with both documents. While *Spinoff 1998* is clearly targeted at an external audience, the *NASA Strategic Plan* explicitly targets an internal audience, but ultimately is written for an external audience as well.

According to *Spinoff 1998*, the benefits or "spinoffs" of NASA "to you, the taxpayer are forever increasing, and improving the quality of life for all humankind" (www.sti.nasa.gov/tto/spinoff1998/intro98.htm). The use of the second person pronoun "you" and the appositive "the taxpayer" indicates that this document targets an audience external to NASA. Specifically, the document targets "the taxpayer."

Like *Spinoff 1998*, the *NASA Strategic Plan* also uses direct language to indicate the audience to which the report is targeted. The language of the document indicates a strictly internal audience. Emphasis is placed on "we" and "our." The first paragraph of the section entitled "Strategic Outlook" begins, "All members of the NASA team...should feel a tremendous sense of pride in our many accomplishments over the past 5 years" (www.hq.nasa.gov/office/nsp/outlook.htm). The paragraph continues as a

list of all of the accomplishments that the NASA team has achieved, using the first person plural pronouns eight times. Furthermore, the placement of “we” and “our” in the beginning of each sentence reinforces the idea of NASA as a team. Phrases such as “We intend to build on,” “Our unique capabilities,” “Our exploration,” and “We will develop” emphasize the fact that, on the surface, NASA wrote this document for its employees. However, the propaganda-filled rhetoric leads me to believe that the intended audience of this report is not the “we” that is so heavy-handedly repeated. The report is actually intended for an outside audience.

The third paragraph of the “Strategic Outlook” reads “NASA will implement programs to achieve a three-part mission encompassing Scientific Research, Space Exploration, and Technology Development and Transfer” (www.hq.nasa.gov/office/nsp/outlook.htm). The first person “we” of the previous paragraphs has become the third person “NASA.” Thus, although the report appears to be written strictly for an internal audience in its beginning, it subtly shifts its target audience in the third paragraph so that the document incorporates both an internal and external audience.

Layout

While addressing PDF documents, I discussed each report in terms of its sections, organizational approach, length, and word count. This section will discuss the HTML *Spinoff 1998* and the *NASA Strategic Plan* in terms of the same features, but will also discuss their use of images, color, and links. These features, discussed in Chapter 2, are

intrinsic to the nature of HTML documents and will be important in my discussion of genre in Chapter 4.

Spinoff 1998 begins with a title page that includes a link to the Table of Contents. The Table of Contents serves as both the table of contents and as links to the proceeding web pages. There are 30 links listed on the Table of Contents page. When users click on a link within the Table of Contents, they are taken to pages containing text in paragraph form. Each web page also has options to link to the “Previous Page,” “Home,” “Contents,” or “Next page.” The site, then, contains both hierarchical and linear organization.

In terms of layout, every page follows a similar pattern. The “NASA Headquarters and Centers” link, for example, contains the equivalent of six pages of printed text in paragraph form. There are 5 images; however, they are not interactive. They do not serve as links to other pages; they are merely decorative. The page does contain one bulleted list, but even it is highly paragraph-like in its structure. Figure 3, for example, is a screen shot taken of the first bullet in the bulleted text. And this is the shortest bullet within the list. The proceeding bullets contain five, seven, and ten lines of text when printed. There are sub-headings within the text, but these are not anchored or

- **Space Science Enterprise** is to solve mysteries of the universe, explore the solar system, discover planets around other stars, search for life beyond Earth; from origins to destiny, chart the evolution of the universe and understand its galaxies, stars, planets, and life;

Figure 3: Text from NASA’s *Spinoff 1998*
Source: <http://www.sti.nasa.gov/tto/spinoff1998/ard1.htm>

linked. They simply serve as sub-headings in the tradition printed text format. The first three pages of the “NASA Headquarters and Centers” page, when printed, contain 11 paragraphs averaging 89 words per paragraph. The entire website contains navy blue text on a white background.

The *NASA Strategic Plan*, like *Spinoff 1998*, also incorporates both hierarchical and linear organization schemes. It begins with a main page that allows users to link to a detailed table of contents. The table of contents then serves as links to individual pages. In total, there are 11 links to other web pages from the table of contents. Each page that users link to also has options to move “Back” or “Forward” or to the “Appendix,” “Glossary,” or “Contents.”

The *NASA Strategic Plan* also has a white background with navy text throughout the entire website, and similar to *Spinoff 1998*, it is comprised of dense paragraphs and minimal graphic images. When users click “Administrator’s Strategic Outlook,” they are taken to a page that begins with the paragraph referenced in Figure 4. Furthermore, based on the first three pages of text, when printed, *NASA Strategic Plan* has 10 full paragraphs averaging 87.2 words per paragraph. In addition, in the first three links, which is the equivalent of ten printed pages, there is not a single graphic. Also like *Spinoff 1998*, the pages, with the exception of the Table of Contents, do not contain any links. While the pages do use subheadings to divide the web pages, they act merely as traditional print headings; they do not serve as anchors to the page or links to additional pages.



All members of the NASA Team—our employees, contractors, academic researchers, industry, Government, and international partners—should feel a tremendous sense of pride in our many accomplishments over the past 5 years. We have looked back to the beginning of time and discovered new galaxies and planets in other solar systems. We captured the world's imagination with the remarkable achievements of the Mars Pathfinder and Hubble Space Telescope missions. We have increased our understanding of the effect of natural and human-induced activities on our home planet. Investments initiated in the past have increased the competitive posture of the aviation, space launch, and communications industries of the present. On Space Shuttle missions, we have performed experiments and technological feats that are paving the way to an era of permanent human presence in space. These achievements, and many more, are responsible for the resurgence and solidification of interest and support for NASA's activities among the Administration, Congress, and the public.

Figure 4: Text from the *NASA Strategic Plan*
Source: <http://www.hq.nasa.gov/office/nsp/outlook.htm>

DOCUMENT PUBLISHED IN PDF AND HTML

NASA published its *NASA Strategic Enterprises* report in both PDF and HTML form. Just as the previous sections, this section will discuss both forms in terms of their purpose, intended audience, and format. Since both forms convey the same information, I will discuss the purpose and intended audience of the documents together, and then will discuss the layout of the documents in separate subsections.

Purpose

The purpose of the *NASA Strategic Enterprises* report is similar to that of the *NASA Strategic Plan*. NASA claims, in both the PDF and HTML version of the report, that it “charts our trajectory into the frontiers of flight, space, and knowledge”

(<http://www.nasa.gov/newsinfo/publicreports.html>;
(ftp://ftp.hq.nasa.gov/pub/pao/reports/2000/2000-strategic_plan.pdf). The report documents the goals and objectives of NASA, which correlate with the six fundamental questions of science and technology that NASA strives to answer. Within this report, NASA maps its Near-term Plans for 2000-2005, Mid-term Plans for 2006-2011, and Long-term Plans for 2012-2025. There is no discernible difference in the purpose of the PDF version and the purpose of the HTML version.

Intended Audience

Based on the content, the *NASA Strategic Enterprises* report aims itself at an external audience, the American public. As I established in the previous subsection, the purpose of the document is to unveil the near, mid, and long-term plans that NASA has, but there are no specifics given in terms of those plans. For example, one of the Long-term Plans identified in the report is to “apply and refine countermeasures for safe, effective, and affordable long-duration human space flight”

(<http://www.nasa.gov/newsinfo/publicreports.html>;
(ftp://ftp.hq.nasa.gov/pub/pao/reports/2000/2000-strategic_plan.pdf). The plan does not specify details of the applications and refinements that will be made indicating that this report is intended for the American public who need to know over-arching goals without knowing specifics of how the goals will be achieved.

Layout of PDF

The PDF version of the *NASA Strategic Enterprises* report begins with a contents page that lists key sections of the document with page numbers as reference. The chapters of the PDF are not created as separate documents to enable users to read one chapter at a time. Instead, the report is one unified PDF. Users who want to read page 69, must scroll through 68 full pages. While some sections, such as the “Administrator’s Strategic Outlook,” are primarily comprised of text-rich paragraphs, the majority of the document contains bulleted lists. For example, in pages six through thirteen, there is not a single paragraph. In fact, there is not a single complete sentence. NASA only uses bulleted lists in these sections.

Layout of HTML

For the most part, the HTML version of the report is the same as the PDF version. The document contains a table of contents that, instead of listing page numbers, serves as links to subsequent pages. Just as the other HTML documents that I have reviewed, the *NASA Strategic Enterprises* report contains elements of both Hierarchical and Linear Organization. There is a Table of Contents on the main page, which also serves as links to subsequent pages, and forward and backward buttons on each individual page. As a result, it is easy to read the HTML document in the same way that one would read the PDF document. Users can simply click on the first link and then go “forward” from there.

It is important to note, however, that there are a number of listings on the Contents page of the PDF document that are not included in the HTML document. The following listings in the PDF document do not appear in its HTML counterpart:

- Summary
- Enterprises
- Manage Strategically
- Provide Aerospace Products and Capabilities
- Generate Knowledge
- Communicate Knowledge
- Consultation
- Performance Planning
- Evaluating and Reporting Performance
- Resources
- Acronym and Glossary

In this HTML document, unlike the previous NASA documents, NASA does use images and rollover features as interactive elements for users. For example, when users click on “NASA’s Core Values,” they enter a page that lists four words down the left margin: “Safety, People, Excellence, and Integrity.” As users scroll over each word, an image and text pertaining to each heading appears in the right margin of the page. When users click on the “Fundamental Questions” link, they enter a page containing six images. As users scroll over each image, one of the fundamental images that NASA aims to answer appears.

CONCLUSION

While NASA does begin to take advantage of HTML's interactive elements such as images and rollover features in its HTML version of the *Strategic Plan* and does contain subtle differences between the table of contents in its PDF and HTML versions of the document, the differences are extremely minor. And in the documents that I presented earlier in this chapter, there is little if any difference between a document published in PDF and a document published in HTML. Furthermore, I cannot determine, based on my review of the intended audience and purpose of all of the NASA documents, any specific reason for the decision to publish in PDF versus HTML or vice-versa. It appears, instead, that NASA has no rhetorical purpose for publishing the documents in one version over the other. Chapter 4, which discusses each document presented here in much more detail, addresses this issue and determines, as a result, that NASA's PDF and HTML documents are not representative of distinct genres.

CHAPTER 4: ANALYSIS OF NASA'S PDF AND HTML DOCUMENTS IN TERMS OF GENRE THEORY

Previous chapters have focused on theory and an introduction of the NASA documents that I chose as the focus of this thesis. Chapter 1 discussed genre theory, particularly the work of Carolyn Miller identifying genre as being based on the action that a particular discourse community needs to accomplish with a text. Chapter 2 reviewed the literature of layout and design as it pertains to print and HTML documents, particularly technical reports. Chapter 3 dissected the NASA documents that are the focus of this thesis in terms of their purpose, intended audience, and layout. This chapter will serve as the culmination of the previous chapters. Here, I will address the question that this thesis seeks to answer: Do PDF and HTML documents represent separate and distinct genres?

When I began my research, I felt confident that PDF and HTML documents do, in fact, represent separate genres. I was sure that a close reading of the NASA documents that I chose would prove what I already knew, that according to Carolyn Miller's definition of genre, PDF and HTML documents respond to the needs of separate discourse communities to perform separate actions and, therefore, represent distinct genres. What I found proved to be much different. This chapter will identify my assumptions regarding PDF and HTML documents and why I thought that they were of distinct genre categories. Then, I will discuss what I actually found in the NASA documents and why I feel that these documents, in fact, do not represent two genres.

MY ASSUMPTIONS

As I stated in the introduction to this chapter, when I began my research I assumed that my work would show that PDF and HTML documents represent two separate genres. In this section, I will identify the assumptions that I made pertaining to PDF and HTML documents. Acknowledging and understanding these assumptions is key to why, in terms of this thesis, I have changed my perception. My assumptions were:

1. PDF and HTML documents appeal to the needs of varying discourse communities as defined by Miller.
2. PDF and HTML documents enable users to perform varying actions as defined by Miller.

Before I can thoroughly discuss my assumptions, I must first establish the theory that led me to make those assumptions. My assumptions hinged on the following:

1. Based on Kinneavy's Communication Triangle, the "signal" in PDF and HTML documents is altered.
2. Based on Kinneavy's Communication Triangle, the "encoder" and "decoder" follow a traditional relationship within PDF documents; whereas, the "encoder" and "decoder" relationship in HTML documents experience a power struggle.

Kinneavy's "Signal" in PDF and HTML

In Kinneavy's application of the communication triangle, emphasizing one of the points of the triangle changes the type of writing that the reader is experiencing. Altering

one of the vehicles of communication alters the mode of communication. For example, if the “encoder” is emphasized, the writing is expressive. If the “decoder” is emphasized, the writing is persuasive. If the “reality” is emphasized, the writing is scientific. If the “signal” is stressed, the writing is belletristic. But where does this place writing that does emphasize “reality” and therefore is scientific, but also experiments with “signal”? The “signal” contained in PDF and HTML documents is clearly different.

Although it is true that writers are expected to “integrate the visual and the verbal” (Schraver XXV) when designing documents, the level to which they must incorporate the visual differs when we look at a PDF document versus an HTML document. As a result, the text, or in Kinneavy’s terms the “signal,” is different in a PDF document than it is in an HTML document. In a PDF document, an image may exist as nothing more than art, placed there to satisfy the reader’s aesthetic needs. While the image may communicate something on a deeper level, it is not required to do so. For example, the image of a smiling child next to text advertising for a psychologist may communicate to a reader on a subliminal level, “if I send my child to this psychologist, she will be more well-adjusted and happy.” The reader may make the connection between the message and image, but he does not have to in order to understand the text. The reader can simply appreciate that aesthetically pleasing image of the smiling child.

In the same HTML document, however, the image of the smiling child might serve as a link to information regarding the psychologist’s services pertaining to children. In this case, it is of the utmost importance that the reader understands the message that this image is communicating. If he does not, he will not know where to obtain the

information that he needs. In the case of an HTML document, therefore, images take on a much greater role and should, as a result, be considered more thoroughly.

Thus, we see that the “signal” of a PDF document and that of an HTML document is different. In one case, images are aesthetic and communicate on a subliminal level; in the other, images are central to the communication process. Later in this chapter, I will discuss my assumption that change in “signal” would alter the action performed with the document.

Kinneavy’s “Encoder” and “Decoder” in PDF and HTML Documents

In the typical PDF document, the user either prints the document or reads through it on the screen. Either way, the document is read in the order that its author intended for the document to be read, from beginning to end. I am, of course, aware that many readers will skim through sentences, paragraphs, and even chapters of text or use the table of contents to jump to a particular section of the text. These are all ways that we “read,” but when presented with a document that has a clear beginning, middle, and end, we are more likely to read that document in that manner. Even in cases where the PDF document is long and individual chapters can be downloaded in any particular order the reader chooses, there is still a clear chapter order indicated to the reader through devices such as chapter order and page numbers. Authors, then, present the document in the manner in which they intend for the document to be read. As a result, in Kinneavy’s terms, the “encoder” has some control of the document’s interpretation and power over the reader’s approach to the document.

HTML, however, is very different. The author knows that there is no clear beginning, middle, and end. The author has no idea how the document will be “read.” Each reader will approach the document differently. With HTML documents, then, the lines of “encoder” and “decoder” are blurred. The “decoder,” while choosing what links to read and in what order, has more control over the HTML text than he has over the PDF text. As a result, he is not only the “decoder,” experiencing the text for the first time, but he is also the “encoder,” determining what way the text should be read.

This blurring of “encoder” and “decoder” in HTML documents clearly affects the manner in which the HTML text is read. Again, the reader of an HTML document has more power over the reading process, and this is key to my assumption that an HTML document would appeal to a different audience or discourse community.

Assumption 1: PDF and HTML Documents Appeal to the Needs of Varying Discourse Communities

It is no secret that PDF and HTML documents serve different purposes. PDF documents are easy to print in their entirety while maintaining their intended page layout; HTML documents require no special software for access. So it could be argued that PDF and HTML documents meet the needs of users who need to print their documents and who do not have Adobe Acrobat, respectively. But my original assumptions about the discourse community who would choose PDF over HTML, or vice-versa, were more detailed. Based on my personal experience, layout and design principles, and Kinneavy’s communication triangle, I assumed the user of a PDF document would intend to study the

document in its entirety, while the user of an HTML document would more likely be a casual user of the document.

My original assumption was the user of a PDF document would typically be of a more “serious” discourse community. Based on the functionality of a PDF document, the user would be able to easily print the document, read it as a whole, and have the document to reference in the future. Because the document would have a defined beginning, middle, and end, it would be easy for the “encoder” to walk his audience through technical subject matter, meant to be researched, studied, and absorbed.

Users of an HTML document, however, can represent a number of different audiences. They may be the casual surfer, interested in the information only as long as their attention spans allow. They may be looking for some specific information to satisfy a particular question or research need. They may be “serious” users of the PDF document who, after reading the document in its entirety in PDF form, prefer to reference the HTML document with minor questions; they have already read the PDF document. Now they prefer the flexibility that the HTML document allows as they control what sections of the document they view. Ultimately, my assumptions were that the PDF user would be of a discourse community that required a more traditional reading of a document; whereas, the HTML user would be of a discourse community that used the document for quick reference and, thus, required more control in the reading process.

Interestingly, this assumption is reinforced in one of the NASA reports referenced in Chapter 3. In the *Aeronautics and Space Report of the President: Fiscal Year 1997 Activities* report, there are a few key subtle differences between the HTML and PDF

versions. In the HTML version, the following paragraph is listed on the “homepage” of the website:

The National Aeronautics and Space Act of 1958 directed the annual Aeronautics and Space Report to include a “comprehensive description of the programmed activities and the accomplishments of all agencies of the United States in the field of aeronautics and space activities during the preceding calendar year.” In recent years, the reports have been prepared on a fiscal year (FY) basis, consistent with the budgetary period now used in programs of the Federal Government. This year’s report covers activities that took place from October 1, 1996 through September 30, 1997.

This paragraph communicates two important pieces of information: the dates that the information within the report covers and, more importantly, the purpose of the document. It is important to note, then, that on the HTML version of the document, this paragraph appears on the first page of the website, whereas, in the PDF version of the document, the paragraph can be found after the Table of Contents page on page 4. The implication is that the PDF user will be more familiar with the document and, therefore, will not need a purpose statement as early in the reading process as an HTML user does.

In addition, the HTML contains exactly the same information that the PDF version does with one exception: an index. Clearly, a traditional index would not serve any purpose within a website. But interestingly, there is no site map contained within the document either. The argument could be made that this must mean the author of the document assumes that the HTML user will be more familiar with the document and,

therefore, will not need an index; however, the more likely assumption is that the PDF user is one that will more regularly use the document as a reference tool in its print form.

These differences, though subtle, are important to note and reinforced my original assumptions; however, I quickly realized that the NASA documents in PDF and HTML form contained many more over-arching similarities. Those similarities would, in the end, force me to determine that, ultimately, the NASA documents published in PDF and HTML are of the same genre. I will discuss those similarities in more detail later in this chapter.

Assumption 2: PDF and HTML Documents Enable Users to Perform Varying Actions

My second assumption was that PDF and HTML documents would be used to perform different actions. My assumption, here, is tied closely to Assumption 1; again, I assumed that PDF users would be the more serious of the two, perhaps scholars, subject matter experts, or those who have a sincere interest in the content of the document; whereas, HTML users would use the document casually and quickly. Therefore, in terms of the action that the documents would be used to accomplish, the PDF document would be used to read and study; whereas, the HTML document would be used to reference. Ultimately, the PDF and HTML documents may meet the same action (for example, to learn about NASA's goals and objectives), but the time and extent to which that action would be satisfied would differ.

Based on my assumption that PDF documents would be used to read and study, it would naturally follow that the emphasis of a PDF technical report would be placed on content. In order to read the document and fully comprehend its message, users would need a document that, among other characteristics, focused on the information being presented. Users of this document would not want graphical images to interfere with his goal of learning; they would instead want tables and graphs to assist them. They would not want layout and design of the document to become paramount; they would instead want a simple layout, which would easily and logically guide them through the content of the report.

On the other hand, I assumed that technical reports published in HTML would be used for quick reference. In order to help users find information quickly and enhance the aesthetic appeal of the document, graphic elements would play an important role in HTML technical reports. Images, which convey information in an automatic, intuitive sense, would serve as links for quick, easy searching and would help casual users of the document understand its content.

Furthermore, since casual users of the document would want to access information as quickly as possible, I assumed that HTML reports would follow the guidelines established in Chapter 2 in terms of text length. According to Nielsen and Shriver, designers should write for “scannability,” ensuring to use meaningful headlines, bulleted lists, and highlighted words for emphasis whenever possible (Nielsen 104-106; Shriver 512). The less dense text on any given page allows for users to skim and scan the

page more easily and, thus, results in a more readable page according to HTML standards.

In this aspect, Kinneavy's "signal" becomes important. Though PDF and HTML reports may be conveying the same information, I assumed that the "signal" would be drastically different. Whereas I thought PDF documents would tend to have large portions of dense text with occasional bulleted lists, tables, graphs, and figures to reinforce the document's content, I assumed HTML documents would rely on bulleted lists, tables, graphs, and figures to quickly communicate content. The signal would be altered because the "encoder" would be able, at times, to communicate a sentence worth of text with one image. The end result of the altered "signal" is a more streamlined process for the "decoder."

COMPARISON OF PDF AND HTML DOCUMENTS

In the previous section, I discussed my assumptions regarding the differences between technical reports published in PDF and HTML forms. I had naively accepted that PDF and HTML documents would generally follow the basic guidelines established for them regarding layout and design. If the NASA documents followed those guidelines, I do believe that they would have met the needs of varying discourse communities wanting to perform distinct actions and, therefore, they would have represented distinct genres. The NASA documents published in HTML form, however, do not follow design and layout guidelines. Because the HTML versions of the NASA

technical reports do not adhere to recommendations in terms of links, lists, images, and dense text, there is not a significant difference between the PDF and HTML forms of the technical reports. Therefore, it cannot be assumed that the PDF and HTML forms respond to different discourse communities wanting to perform different actions.

Links

According to my review of the literature surrounding layout and design of HTML pages, links should be as few in number as possible while still effectively chunking text into readable portions, appear at the top of the page, and be part of a clear organizational structure. The links of the NASA documents are not few in number, nor do they appear across the top of the page. Furthermore, while the NASA HTML documents do contain a clear organizational structure, it is not significantly different than that of the PDF documents.

Each of the NASA reports contains a large number of links. *Spinoff 1998* has the most links with 30. The *NASA Strategic Plan* does better with only 15 links, but most of the links have subheadings listed beneath them. The subheadings, although most of them aren't links, do add length to the list of links. In fact, when printed, the list of links on the *NASA Strategic Plan* homepage fills two pages. This length creates a long list of links that users must read before selecting the link they need. Finally, the *NASA Strategic Enterprises* report does reduce its headings from the 34 table of contents listings in the PDF document, but at 24 links, users still have too many choices to make from the homepage.

In terms of where the links appear on the page, in all of the NASA HTML documents that I introduced in Chapter 3 links appear as a vertical listing on the homepage. According to usability experts, this creates a problem for users who must wait for an entire page to load before seeing the links from which they have to choose, but more central to this thesis is how this causes the document to be read. Although there is no specific order listed to the links, leaving the links in a vertical list implies the order of a traditional table of contents.

Furthermore, the organizational structure that all of the HTML documents follow serves more as chapter divisions in a book than as navigation tools. In each of the HTML documents, there is a table of contents on the homepage, which serves as links to subsequent pages, and there are forward and backward buttons on each individual page. As a result, it is easy to read the HTML document in the same way that one would read the PDF document. Users can simply click on the first link and then go “forward” from there.

Lists

Although the literature recommends that both PDF and HTML documents use lists to break text into readable chunks for readers, the research shows that the usability of HTML documents depends on them. NASA, however, rarely uses bulleted or numbered lists within its HTML reports. And if, on occasion, a report does contain a list, it does not help to break the text into readable chunks. For example, the “NASA Headquarters and Centers” link from *Spinoff 1998* contains one bulleted list in six pages of text and even it

is highly paragraph-like in its structure. Figure 5, for example, is a screen shot of the bulleted list. Although this text does contain bullets, they do not serve the function that bullets traditionally serve. Used to create whitespace, which Shriver (511), Morris (“Timeless Typography”), and Nielson (125-126) recommend, and to increase scannability (Spool 70; Shriver 512; Nielson 104), bullets are meant to assist readers by logically chunking and eliminating superfluous text. The bullets in *Spinoff 1998*, however, do not create whitespace or improve scannability. As a result, the text of the HTML documents is much like the text of the PDF documents, full of dense, text-rich paragraphs. And perhaps the text of the HTML documents is even denser than that of the PDF; at least paragraphs in the PDF documents are indented. The bullets in the HTML version are not indented and, therefore, contain no whitespace whatsoever. And the one HTML document that does rely heavily on lists (*NASA Strategic Enterprises*) has a PDF counterpart that also contains a large amount of bulleted lists. Ultimately, then, although literature recommends that HTML documents chunk text as often as possible, NASA’s HTML documents do not use lists any more regularly than their PDF reports.

Images

While one of the advantages of HTML documents is their ability to incorporate images and graphic displays, NASA’s HTML documents do not use any more images than their PDF documents. For example, from the “NASA Headquarters and Centers” link in *Spinoff 1998* there are only five images in the equivalent of six printed pages of text.

The Plan defines four Strategic Enterprises:

- **Space Science Enterprise** is to solve mysteries of the universe, explore the solar system, discover planets around other stars, search for life beyond Earth, from origins to destiny, chart the evolution of the universe and understand its galaxies, stars, planets, and life;
- **Earth Science Enterprise** is to expand scientific knowledge of the Earth system using NASA's unique vantage points of space, aircraft, and in-situ platforms, creating an international capability to forecast and assess the health of the Earth system, disseminate information about the Earth system, and enable the productive use of Mission to Planet Earth science and technology in the public and private sectors;
- **Human Exploration and Development of Space Enterprise (HEDS)** is to prepare for the conduct of human missions of exploration to planetary and other bodies in the solar system, use the environments of space to expand scientific knowledge, provide safe and affordable human access to space, establish a human presence in space, and share the human experience of being in space; and to enable the commercial development of space and share HEDS knowledge, technologies, and assets that promise to enhance the quality of life on Earth, and the
- **Aeronautics and Space Transportation Technology Enterprise** which has three major technology goals supported by a set of enabling technology objectives. In global civil aviation, a technology goal is to enable U.S. leadership through safer, cleaner, quieter, and more affordable air travel. Another technology goal is to revolutionize air travel and the way in which aircraft are designed, built, and operated. A third technology goal is to enable the full commercial potential of space, and expansion of space research and exploration. This Enterprise also carries a service goal to enable, and as appropriate, provide, on a national basis, world-class aerospace research and development services, including facilities and expertise, and proactively transfer cutting-edge technologies in support of industry and U.S. Government research and development.

Figure 5: Bulleted List from NASA's *Spinoff 1998*
Source: <http://www.sti.nasa.gov/tto/spinoff1998/ard1.htm>

Furthermore, they are not interactive. Nothing differentiates these images from the images of PDF documents. In the *NASA Strategic Plan* report there is not a single graphic in the first three links, which is the equivalent of ten printed pages. If we were to accept my assumption that the user of an HTML document would be a more casual user, it would follow that he would be more interested in graphic displays that would help to break text. But NASA's HTML documents do not incorporate any more images than their PDF documents do.

To NASA's credit, the *NASA Strategic Enterprises* report does take some advantage of HTML's capabilities. In this HTML document, NASA does use images and rollover features as interactive elements for users. For example, when users click on "NASA's Core Values," they enter a page that lists four words down the left margin: "Safety, People, Excellence, and Integrity." As users scroll over each word, an image and text pertaining to each heading appears in the right margin of the page. When users click on the "Fundamental Questions" link, they enter a page containing six images. As users scroll over each image, one of the fundamental images that NASA aims to answer appears.

In this document's PDF counterpart, the elements that appear as users rollover images in the HTML document appear on the screen at all times. For example, in the section entitled "NASA's Core Values," the core values are listed as headings with text and images listed beneath the heading. In the PDF document, then, the user does not have to know to scroll; the "encoder" has automatically given him the information that he needs.

As a result of these features, this report, presented in both PDF and HTML form, does reinforce one of my assumptions: that HTML and PDF forms would alter, in Kinneavy's terms, the "signal" of a document. In PDF the "encoder" has ultimate control of the presentation of the document; whereas, in HTML the "decoder" receives some of that control. However, this is only one report and one of the features that I reviewed. Interactive images, alone, are not enough to constitute a document that targets a unique discourse community.

Dense Text

The result of not effectively linking pages, creating lists, and using images is a website that contains long passages of dense text. Because NASA's HTML documents do not incorporate the aforementioned features, their HTML pages are long, text-driven, and look no different than their PDF documents. Link, for example, to <http://www.sti.nasa.gov/tto/spinoff1998/ard1.htm>. Arriving at "NASA Headquarters and Centers" of *Spinoff 1998*, users will see the equivalent of six pages of printed text in paragraph form. Figure 6 is a screen shot taken from the beginning of the page. Obviously, this passage is text-driven, and it is no different than the rest of the document. The HTML page contains 22 paragraphs just like the four presented here.

And this page is not the only NASA HTML page that is text-driven. Take, for example, Figure 7 from the other NASA HTML pages. Both *Spinoff 1998* and the *NASA Strategic Plan* rely on text, and text alone, to convey their messages. In fact, all of NASA's HTML documents reviewed for the purpose of this thesis are text-driven.

Spotlight on Langley Research Center

History in the Making

The National Aeronautics and Space Administration (NASA) celebrates forty years of stellar progress. Established in 1958, NASA is steeped in four decades of historical achievement--a twentieth century civilian agency headed to even more impressive accomplishments in the twenty-first century.

Today, the vibrant nature of American aeronautical and space expertise is evident in the air, above the Earth, and outward to distant locales throughout the solar system. New technologies are transforming civil aviation, making air travel safer, more affordable, and less harmful to the environment. The Hubble Space Telescope has become an active, on-duty orbiting observatory that allows astronomers to capture glimpses of new galaxies, view the formation of faraway solar systems, and seek answers as to how the Universe itself began.

Spacecraft are now en route to Saturn and reaching out to asteroid Eros. The moon is being resource mapped, pole to pole, by Lunar Prospector. Mars Global Surveyor circles the red planet armed with a host of scientific sensors. Meanwhile, the Galileo spacecraft continues on an extended mission to scrutinize Jupiter's ice-covered moon Europa, and that Jovian hot spot of a world, volcanic Io. Lastly, preparations are moving forward to launch the first segments of the International Space Station, an initiative that truly gives humanity a foothold on the future.

These are exciting times. NASA's three-part mission encompasses the embracing of scientific research, space exploration, and technology development and transfer. This effort is built upon a past history of remarkable achievement, but with full knowledge that still more ambitious goals await.

Figure 6: Dense Text from NASA's *Spinoff 1998*
Source: <http://www.sti.nasa.gov/tto/spinoff1998/ard1.htm>

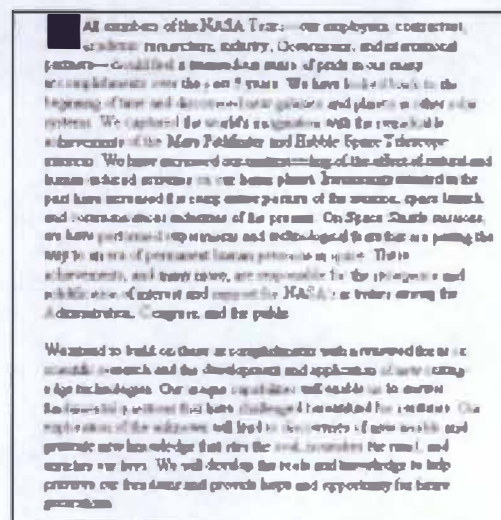
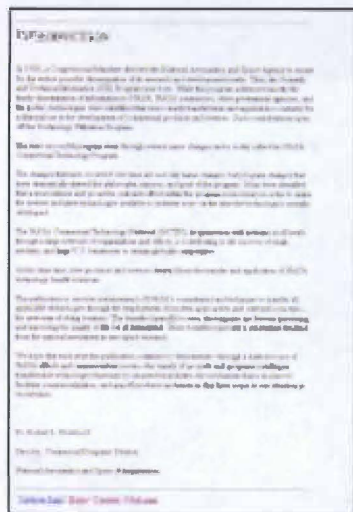


Figure 7: Dense Text from NASA HTML pages
Source: <http://www.hq.nasa.gov/office/nsp/outlook.htm>;
<http://www.sti.nasa.gov/tto/spinoff1998/intro98.htm>

Enhancing Mission Success and the *FBC Task Report*, both PDF documents, are, not surprisingly, text driven. For example, based on the first three pages when printed of the Executive Summary in *Enhancing Mission Success*, there are 13 full paragraphs containing on average 77.7 words each. The first three pages of the *FBC Task Report* contain 20 full paragraphs averaging 50.45 words in length. What is surprising, however, are these numbers as compared to similar numbers taken from the HTML documents. The first three pages of the “NASA Headquarters and Centers” page of *Spinoff 1998*, when printed, contains 11 paragraphs averaging 89 words per paragraph, and the first three pages of text, when printed, of the *NASA Strategic Plan* has 10 full paragraphs averaging 87.2 words per paragraph. Both HTML documents contain longer paragraphs than the PDF documents.

NASA DOCUMENTS—NOT SEPARATE GENRES

So what does all of this mean? Why does it matter that NASA's HTML documents do not follow the layout and design guidelines that I established in Chapter 2? And how do the actual NASA PDF and HTML defy my assumptions?

First, think back to Carolyn Miller's definition of genre. According to Miller, genre is dynamic and social; it is a response to the exigence created by a discourse community, and it is a *recurring* response. Furthermore, it is through the genre that the discourse community is able to achieve "social action."

In order for me to determine that NASA's PDF and HTML documents represent distinct genres according to Miller's definition, I would have to establish that PDF and HTML documents target two distinct discourse communities or that they meet two distinct needs of one discourse community.

In Chapter 3, I closely examined the intended audience of each report based on a rhetorical analysis. Through this rhetorical analysis, I determined it impossible to say that the PDF documents target one type of discourse community while the HTML documents target another. In fact, what I found instead was that of the two PDF documents I reviewed, one was written for an internal audience and one was written for an external audience. The HTML documents proved to do the same.

Furthermore, if my assumptions surrounding Kinneavy's theories regarding "encoder" and "decoder" had been correct, the mere layout of the documents would have implied that the documents were targeted at distinct discourse communities or, at the least, enabled one discourse community to perform two distinct actions. The PDF

documents would have, following the guidelines of their print counterparts, contained key elements such as a table of contents and index. The PDF documents, being technical reports, would have contained dense text, but would have incorporated bulleted lists and diagrams whenever possible. And NASA's PDF documents contain all of these characteristics, but NASA does not follow the layout and design principles established in Chapter 2 in regards to its HTML documents. Ignoring the advice of experts, NASA's HTML documents contain no more lists than their PDF documents; they do not link pages in an effective, usable manner; they contain minimal images, and they contain vast pages of dense text. As a result, the HTML documents are basically no different than the PDF documents.

And what does this mean in terms of genre theory? Again, according to Miller, a genre is a response to the exigence created by a discourse community. NASA's PDF and HTML documents do not contain enough differences to assert that they meet the needs of distinct discourse communities or that they meet distinct needs of one discourse community.

CONCLUSION

In the Introduction, I stated that my Conclusion would address the importance of the genre question on a larger scale than previous chapters. Whereas Chapter 3 and 4 looked at genre theory in terms of NASA's PDF and HTML technical reports, here I will discuss the genre question in terms of PDF and HTML documents in general. Why is it important that technical communicators be aware of genre theory when designing for the internet? And if the NASA documents do not represent separate genres in their PDF and HTML forms, does this mean that PDF and HTML documents in general are not separate genres? And finally, as technology progresses will PDF documents become so like HTML documents that the question is a moot point all together?

WHAT IS THE IMPORTANCE OF THIS THESIS TO TECHNICAL COMMUNICATORS?

In *Writing By Design: A Handbook for Technical Professionals*, Greene and Ripley ask,

Where will your readers be when they read your message? The answer to this question can help you create a successful document. For example, there are fish-viewing guides for snorkelers and divers that are sealed in clear plastic so that they can be taken into the water. There are car repair manuals designed with large type and a page surface that grease does not stain. (95)

In this passage, Greene and Ripley touch on a key rhetorical issue—audience need. In their examples, the need of the audience dictates the very medium through which information is communicated. Yes, both the divers and mechanics use books, but they do not use standard books. The special needs of their professions require special features for their texts.

In this example, asking the question “Where will your readers be when they read your message?” was key to producing a document that would meet audience need. The question I wanted to ask is not “where” but, instead, “what.” What will readers be doing when they read your message? What will the goal of the reader be? *What is the reader’s need?*

Asking this question is central to producing a successful document. If a technical communicator does not ask and answer this question, how likely is it that he will produce a document that meets the need of the end user? And while the concept of reader’s need is closely tied to audience, they are not one in the same. Being aware of audience requires knowing the type of person who will use your document, while being aware of *need* requires knowing what that person will want to accomplish through your document. Think back to the scenario I discussed in my Introduction. The discourse community, the associates with whom I worked, needed a training document and a reference tool. While my coworker responsible for developing the on-line reference tool was aware of her audience, she was not aware of their needs. Had she been more fully aware of their needs, she would have recognized that they wanted two distinct documents, which enabled them to achieve two distinct goals.

And clearly, genre theory is central to all of this. To accept Carolyn Miller's approach to genre means to accept that audience, with its needs, influences genre. Once technical communicators are aware of the needs of a particular discourse community, creating a text for that discourse community will be a much more successful venture. Recognizing audience need enables technical communicators to duplicate features of all ready existing texts that respond to similar audience needs. Genre theory encourages technical communicators to look for commonalities in documents and to recognize how those commonalities respond to the exigencies of their discourse communities.

Furthermore, throughout my research of genre theory, I found no literature devoted to the question of genre theory in terms of publications on the internet. I did find one article that debated whether e-mail communications constituted a separate genre from their print counterparts. In *Postings on a Genre of Email*, Michael Spooner and Kathleen Yancey present both sides of the genre question as it relates to technology. While Yancey doesn't "see why the technology associated with a text is enough to warrant the claim of a distinctive genre" (262) and argues that "we are simply seeing a transition in the technology that delivers our written genres, not an innovation in genres themselves" (262), Spooner asserts that "Email does...seem to be challenging what we have taken to be both the role/authority of the author as well as the relationship between author and audience" (268). Although neither author definitively answers the question of whether email communication is a distinct genre from its print counterparts, their discussion raises a number of interesting questions. As electronic communication and publication

becomes more common, what is its role in our lives? Does a change in form change the message itself? Does a change in form change the message's audience?

Postings on a Genre of Email does not answer these questions for us, but instead poses the questions and discusses them from multiple points of view. As the answers to these questions are important to a society whose communication is becoming more electronic, my hope with this thesis was to deal with many of the same questions, but to provide more concrete answers. And to add another element to the discussion, my goal was not to answer whether an electronic form of communication was necessarily a different genre from its print counterpart, but to determine whether publishing one document in two differing electronic formats would produce two different genres.

So why is this an important question to ask? The answer, it seems to me, is quite simple. If we accept Carolyn Miller's definition of genre as a dynamic system that is socially constructed to meet the needs of its discourse community, or the answer to a social need, then it is important to determine whether we believe HTML and PDF documents are representative of distinct genres. If it is determined that the two are representative of distinct genres, then the way in which technical communicators approach the two documents would be vastly different.

For example, based on my research using NASA documents, I am unable to say that PDF and HTML documents represent two genres. My sample leads me to believe that PDF and HTML documents do not meet the needs of distinct discourse communities, and therefore should be classified as belonging to the same genre. But is it possible that a review of a much larger sample would show that PDF and HTML documents should be

representative of distinct genres and that NASA documents do not meet the needs of their respective discourse communities? If this were proved to be the case, the importance of this thesis to technical communicators is obvious: technical communicators must be aware of genre theory and its implications in order to produce quality, usable documents for varying discourse communities.

DOES THIS THESIS ESTABLISH THAT PDF AND HTML ARE NEVER SEPARATE GENRES?

While this thesis does establish that a specific set of NASA documents published in HTML and PDF versions do not represent separate genres, I do not believe that it tells us whether or not HTML and PDF documents are always of the same genre. I still believe that my original assumptions regarding HTML and PDF documents have merit and wonder that if researching a separate set of documents would have resulted in different results.

Based on my research of layout and design principles of print and HTML documents, NASA does not follow the advice of experts when it comes to designing their web pages. Their web pages, with a lack of graphics, interactive elements, and passages full of dense text, are incredibly similar to the PDF versions of the same documents. As a result, the documents are too similar for me to conclude that they are meeting different audience needs. But what would the results of this have been if I had chosen a set of documents in which the HTML documents strictly followed the layout and design

principles? I believe that based on such a set of documents, this thesis would have reinforced my original assumptions and would have, as a result, shown that PDF and HTML documents do respond to the needs of varying discourse communities and are, in fact, representative of distinct genres. Unfortunately, proving this hypothesis would become another thesis all together.

Therefore, while this thesis does prove that NASA HTML and PDF documents are not representative of separate genres, it is not accurate to assert it proves that no HTML and PDF documents are representative of distinct genres. This thesis does, however, raise questions to be answered in a separate study involving different documents.

WHAT DO TECHNOLOGICAL ADVANCEMENTS MEAN FOR THIS THESIS?

During the course of writing this thesis, Adobe Acrobat has released version 6.0 of its software. This version contains more hyperlink capabilities than previous versions and indicates that what we know of PDF documents today will, just as with all other technologies, change drastically in the near future. Does this mean that, in time, the genre question will be a moot point?

At this point, I cannot answer this question. Again, this thesis has not even proven that PDF and HTML documents constitute distinct genres; my insistence to hold on to the belief that they do is merely that: my belief. Further research must be done in order to determine whether PDF and HTML documents represent distinct genres.

Furthermore, it is impossible for me to speculate what technological advances the future holds. I can say, however, that the mere addition of hyperlink capabilities to PDF documents does change a central issue: that of the authority of encoder and decoder.

CONCLUSION

While this thesis does not prove my original hypothesis, I believe that it is relevant for technical communicators. Key to the profession of technical communication is providing readers with easy to understand documentation that meets their needs. If technical communicators are not aware of what readers need, they will often provide material that is unhelpful or, worse, never even used. Understanding genre theory will provide the profession with a new way to consider audience need. It is not static, nor does it imply one reader whose needs are easily identified. Discourse communities are often comprised of thousands, possibly millions, of readers and their needs are constantly changing and evolving. And as those discourse communities place new demands on technical communicators for easier, clearer, better, and faster communication, it is essential that we be aware of the living, breathing force that is genre. If we do not recognize that it is the needs of our audience members that dictate the communication that we produce, we will spend countless hours and dollars producing unusable, unnecessary documents.

LIST OF REFERENCES

- Batschelet, Margaret. *Web Writing/Web Designing*. Needham Heights, MA: Allyn and Bacon, 2001.
- Bazerman, Charles. *Shaping Written Knowledge: The Genre and Activity of the Experimental Article in Science*. Madison: The U of Wisconsin P, 1988.
- Beynon, David. "Web Site Usability Lags but Improving." *Computerworld* 28 June 2002. 29 July 2002. <<http://www.computerworld.com.au/IDG2.NSF/AII/94F650DFBEC1987DCA256BE60022.html>>.
- Bitzer, Lloyd. "The Rhetorical Situation." *Philosophy and Rhetoric*. 1: 1-14.
- Bruffee, Kenneth. "Collaborative Learning and the 'Conversation of Mankind'." *College English*. 46.7 (November 1984): 635-652.
- . *Collaborative Learning: Higher Education, Interdependence, and the Authority of Knowledge*. Baltimore and London: The Johns Hopkins U P, 1993.
- Burke, Kenneth. *Language as Symbolic Action: Essays on Life Literature, and Method*. Berkeley and Los Angeles: U of California P, 1966.
- . *The Rhetoric of Motives*. Berkeley and Los Angeles: U of California P, 1970.
- Clapham, Paul. "A Site for Sore Eyes?" *IEE Review* March 2002: 8-10.
- "Client Help Desk." 21 July 2000. 29 July 2002. <<http://www.clienthelpdesk.com>>.
- Coe, Richard M. "An Apology for Form; or, Who Took the Form Out of Process?" *College English*. 49.1 (1987): 13-28.
- Conley, Thomas. "Review of *Form and Genre: Shaping Rhetorical Action*." *Communication Quarterly*. 26.4: 71-75, 1978.

Devitt, Amy J. "Generalizing About Genre: New Conceptions of an Old Concept."

College Composition and Communication. 44.4: 1993, 573-586.

Derrida, Jacques. "The Law of Genre." *On Narrative*. Ed. W.J.T Mitchell. Chicago: U of Chicago P, 1981.

"Domain Stats." 29 July 2002. <<http://www.domainstats.com>>.

Gerhart, Mary. *Genre Choices, Gender Questions*. Norman and London: U of Oklahoma P, 1992.

"Global Reach." 31 March 2002. 29 July 2002. <<http://www.glreach.com/globstats>>.

Goodale, Mark. "Building a Better Website." *Civil Engineering* March 2002: 76.

Greene, Michael and Jonathan G. Ripley. *Writing by Design: A Handbook for Technical Professionals*. Englewood Cliffs, NJ: Regents/Prentice Hall, 1992.

Houp, Kenneth and Thomas E. Pearsall. *Reporting Technical Information*, 5th Ed. New York: Macmillan Publishing, 1984.

"Internet Users in the United States." *Family Education Network* 29 July 2002.
www.infoplease.com/ipa/AO778257.html.

Kinneavy, James. *A Theory of Discourse: The Aims of Discourse*. Englewood Cliffs, NJ: Prentice-Hall, 1971.

---. "The Basic Aims of Discourse." *Cross-Talk in Comp Theory: A Reader*. ed. Victor Villanueva, Jr. Urbana: National Council of Teachers of English, 1997.

Manning, Jamie. "Creating the Customer-Obsessed Web Team." *E-Content* January 2002: 37-40.

- Mathes, J.C. and Dwight W. Stevenson. *Designing Technical Reports: Writing for Audiences in Organizations*. Indianapolis: Bobbs-Merrill Educational Publishing, 1976.
- Miller, Carolyn. "Genre as Social Action." *Genre and the New Rhetoric*. Bristol, PA and London: Taylor and Francis Inc, 1994.
- . "Rhetorical Community: The Cultural Basis of Genre." *Genre and the New Rhetoric*. Bristol, PA and London: Taylor and Francis, Inc, 1994.
- Montgomery, Scott L. *The Chicago Guide to Communicating Science*. Chicago: The U of Chicago, 2003.
- Morris, Charlie. "Build Traffic Through Good Site Design." *Web Developer's Virtual Library* 28 February 1999. 29 July 2002.
<http://www.wdvl.com/Style/Design/Pages/good_bad.html>.
- . "Good Page, Bad Page." *Web Developer's Virtual Library* 28 February 1999. 29 July 2002. <http://www.wdvl.com/Style/Design/Pages/good_bad.html>.
- . "Timeless Typography." *Web Developer's Virtual Library* 28 February 1999. 29 July 2002. <http://www.wdvl.com/Style/Design/Pages/good_bad.html>.
- NASA. *Enhancing Mission Success—A Framework for the Future: A Report by the Chief Engineer and the NASA Integrated Action Team*. 21 December 2000. 27 April 2003. <http://history.nasa.gov/niat.pdf>
- NASA. NASA FBC Task Final Report. 13 March 2000. 27 April 2003.
<<http://www.spaceref.com/mars/reports/03.13.00.fbc.report.pdf>>

NASA. *NASA Strategic Enterprises*. 28 January 2003.

<<http://www.nasa.gov/newsinfo/publicreports.html>>

NASA. *NASA Strategic Enterprises*. 28 January 2003.

<ftp://ftp.hq.nasa.gov/pub/pao/reports/2000/2000_startegic_plan.pdf>

NASA. *NASA Strategic Plan*. 1998. 27 April 2003.

<<http://www.hq.nasa.gov/office/nsp/outlook.htm>>.

NASA. *Spinoff 1998*. 27 April 2003.

<<http://www.sti.nasa.gov/tto/spinoff1998/ard1.htm>>.

Nielson, Jakob. *Designing Web Usability: The Practice of Simplicity*. Indianapolis:

New Riders, 2000.

Pauley, Steven E. *Technical Report Writing Today, 2nd Ed.* Boston: Houghton Mifflin, 1979.

Pauley, Steven E. and Daniel Riordan. *Technical Report Writing Today, 3rd Ed.* Boston: Houghton Mifflin, 1987.

“Personal Communication Systems.” 29 July 2002. <<http://www.pcsinternet.com>>.

Schrivers, Karen. *Dynamics in Document Design: Creating Text for Readers*. New York: John Wiley & Sons, 1997.

Sullivan, Terry. “Mechanics of Reader-Friendliness.” *All Things Web*. 10 April 1997. 29 July 2002. <<http://www.pantos.org/atw/35270.html>>.

---. “Ten More Things to Avoid in Authoring a Web Page.” *All Things Web*. 10 April 1997. 29 July 2002. <<http://www.pantos.org/atw/35270.html>>.

---. "The Vision Thing." *All Things Web*. 10 April 1997. 29 July 2002.

<<http://www.pantos.org/atw/35270.html>>.

Souther, James W. and Myron L. White. *Technical Report Writing*. New York: John Wiley and Sons, 1977.

Spool, Jared. *Web Site Usability: A Designer's Guide*. San Francisco: Morgan Kaufmann, 1999.

Waller, Richard. "The No-No List of Website Features." *Website Evaluation* 29 July 2002. <<http://www.waller.co.uk/nonolist.htm>>.

---. "Usability Rules." *Website Evaluation* 29 July 2002. <<http://www.waller.co.uk/usability.htm>>

Vatz, Richard E. "The Myth of the Rhetorical Situation." *Philosophy and Rhetoric*. 6.3: 154-161.

Vitanza, Victor. *Writing for the World Wide Web*. Needham Heights, MA: Allyn and Bacon, 1998.

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