The Functionality Attribute of Cybergenres

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Abstract

Under the influence of a new medium, a genre may evolve into variants of the original genre or even into new genre. Genre, even through such evolution, are normally characterized by the tuple, <content, form>, and little attention is paid to the functionality afforded by the new medium. The combination of the computer and the Internet, however, has resulted in the emergence of cybergenre, a new class of genre characterized by the triple, <content, form, functionality>. Users approach instances of cybergenre with certain expectations with respect to functionality, as well as to form and content.

This paper examines the "functionality" attribute of various cybergenre in an attempt to identify the essential functionality that this new medium affords us. This should help us to not only understand the influence of this medium on genre, but also help us to use genre effectively in the design of computer and network-based applications.

1. Introduction

A genre is a "classifying statement" [5]. It allows us to recognize items that are similar even in the midst of great diversity. For instance, the detective novel is a particular genre and we are able to recognize novels as members of that genre, even though the novels themselves may be very different. Once recognized as being of the same genre, we can then more easily compare individual novels. Similarly, the newspaper is a genre which is different from magazines and provides us with a framework in which to compare various newspapers.

There are, however, different views on how a genre is characterized. For instance, a genre may be characterized by having similar *content* and *form* where content refers to themes and topics and form refers to, "... observable physical and linguistic features ...," [8]. Genre may also be characterized by *purpose* and *form*, where purpose refers to the socially recognized communicative purpose [1,3,7,9], and form may include, "... [the] communication medium, as well as structural and linguistic features." [9]

As Yates and Orlikowski [8] have shown in their study of the evolution of the business letter of the late 19th century into the electronic mail of today, genres evolve over time in response to institutional changes and social pressures. In some cases, the changes to an existing genre are so extensive that they lead to the emergence of a new genre. One of the triggers for the emergence of variants of existing genres or of new genres is the introduction of a new communications medium [9].

The combination of the computer and the Internet has been such a powerful trigger that it has resulted in the emergence of a new class of genre, which we call cybergenre, existing in this new medium [6]. Cybergenres are characterized by the triple, <content, form, functionality>, where functionality refers to capabilities available in the new medium.

Cybergenres may be based on existing genres or on new genre. The functionality afforded by the new medium drives the evolution of replicated genres, i.e., those based on genres existing in other media, through variations on those genres until new genres emerge that are significantly different from the original genres. In addition, the new medium supports the spontaneous creation of new genres, such as the home page and the hotlist, that have never existed in other media [1]. The functionality not only drives this evolution but, as proposed by Erickson [2], "… on-line interaction has the potential to greatly speed up the evolution of genres."

The major difference between the characterization of cybergenre and of more traditional genre is the introduction of the <function> attribute as part of the characterization of cybergenre. As with all genre, users approach instances of cybergenre with certain expectations with respect to form and content. However, they also have expectations with respect to functionality, i.e., how to interact with the genre and what to expect from the genre. For example, users expect to interact with a Web-based search engine by inputting a search string, viewing a dynamically composed set of responses to the search, viewing selected Web pages, and revising the

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search string through several iterations. They expect the search engine to search its indices, to compose the set of responses, and to retrieve and display the selected Web pages. Once users have used one such search engine, they can easily transfer these expectations of functionality to other instances of this genre.

This research examines Web sites, as examples of cybergenre, and identifies and classifies these cybergenres on the basis of <content, form, functionality>. In doing so, the values of the functionality attributes associated with such pages are identified. Although *purpose* is not an attribute of our characterization of cybergenre, functionality cannot be discussed without reference to the goal or purpose of the genre. Normally, one designs a system with the end-user in mind, i.e., the task, goals and characteristics of the user. However, on the Web, any user (of which there are millions) can access any site and it is difficult to design a system with the goals or purpose of the user in mind. Therefore, purpose must be viewed only from the perspective of the author of the site and thus, the functionality incorporated into the site is driven by this purpose.

The second section of this paper describes this identification and classification and the third section discusses the findings and their implications.

2. Cybergenres in Web Sites

Ninety-six Web sites were examined to look for current patterns in Web site design. The sites were chosen by random.yahoo.com and so may not be a truly random selection of Web sites but we feel the sample is probably representative. Each URL supplied by random.yahoo.com was the URL of a Web page. For the purposes of this research, we viewed each such page as the root of a Web site, even if it was not the actual home page of a Web site. Thus, when we discuss Web sites below, we mean the randomly selected Web page and those pages immediately reachable from that Web page.

These ninety-six Web sites were examined with respect to content, form, and functionality and, on the basis of these attributes, were grouped into the following six cybergenres:

- Home page
- Brochure
- Resource
- Catalogue
- Search engine
- Game

These cybergenres are defined at a high level of abstraction and we recognize that there are more specific categories of cybergenre within each of the six categories, for example, the personal home page and the corporate home page. The boundaries among these cybergenres are fuzzy and, in some instances, a Web site may be a composite of two or more of these cybergenres. For instance, a commercial home page may link to a company catalogue.

The numbers and proportions of each type of cybergenre found in the sample of 96 Web sites is shown in Table 1. The personal and corporate home page cybergenre are shown separately, but together the home page cybergenre constitutes 40 per cent of the total Web sites. One of the corporate home page sites was actually a composite in that it also contained a catalogue, but this catalogue is not included in the figures. No instances of the search engine cybergenre appeared in the sample but we include it for the purposes of discussion.

Table 1. Numbers and proportions of each type of cybergenre found.

Type	Number Found	Proportion
Personal Home Page	13	0.14
Corporate Home Page	25	0.26
Brochure	16	0.17
Resource	34	0.35
Catalogue	5	0.05
Search Engine	0	0.00
Game	3	0.03

2.1. Home Page

About 40 percent of the sampled Web pages can be categorized as home pages (personal or corporate). Almost two-thirds of these are corporate home pages. The purpose of a home page is to show the user the "face" that the person or company wants to present to the world [4]. Figures 1 and 2 are screendumps of a personal home page and of a corporate home page, respectively.

The contents of the personal home pages tend to consist of biographical information about the author whereas corporate home pages consist mostly of information and advertisements about the company's products or services. This coincides with the findings of Roberts [4]. In addition, there is often a hot list linking the user to associated information or to information the author considers might be of interest to the user.

The form of home pages tend to be a general introduction and short chunks of information with subtopics that can be reached by following links. Typically, the site has an hierarchical structure that provides the user with relationships among the various components. There are often visual images and animations as well as text.

The functionality of these sites include browsing and e-mail communication. Almost every home page provides an e-mail connection so that the reader can make further inquiries. Although, for the purposes of his discussion of home pages as genre, Roberts [4] defines genres as, "... different types of non-interactive communicative events," we found that home pages do have functionality based on browsing and e-mail interaction.

Figure 1. Personal home page.

Figure 2. Corporate home page.

2.2. Brochure

About 17 percent of the sampled Web sites were categorized as brochures. We define brochure Web sites as those with content of a largely visual nature and with the main purpose being advertisement. They differ from home pages in the amount of information available and the purpose of the site. This type of site does not tell the user much if anything about the company, rather it is strictly to advertise products and services at a broad, coarse-grained level. The content and form are very similar to the single-page, 3-folded paper brochure; a brief, snazzy view of services or products. The form is largely visual and the structure is fairly flat. The presentation typically has lots of visual impact and may include audio. Figure 3 is a screendump of a brochure-type Web site.

Brochure Web sites are similar to home pages in that they have marginal functionality, i.e., usually only browsing and e-mail. Two sites took advantage of the media to get readers to submit information about themselves. The purpose of this functionality is to establish contact with potential customers.

Figure 3. Brochure Web site.

2.3. Resource

About 35 percent of the sample Web pages could be categorized as resource sites. The main purpose of such sites is to be an information resource. Sites included libraries or journal abstracting services as well as a large number of sites provided by interest groups on topics such as whales, medical conditions, etc. A few of the sites supplied sports information and a few were overtly for education. Figure 4 is a screendump of a typical resource-type Web site.

The contents of such sites are of a largely informational nature on a given topic or a given resource.

Typically, the form of these sites have a broad hierarchy and links to many other resources. These sites often have images, and may have video and audio.

The functionality available in these sites is much richer than for either home pages or brochure sites. The functionality includes browsing, discussion, interaction, e-mail, and often a search capability for that site. The interest groups and the educational sites are pushing the envelop for functionality by introducing interaction, animations, and games for interest.

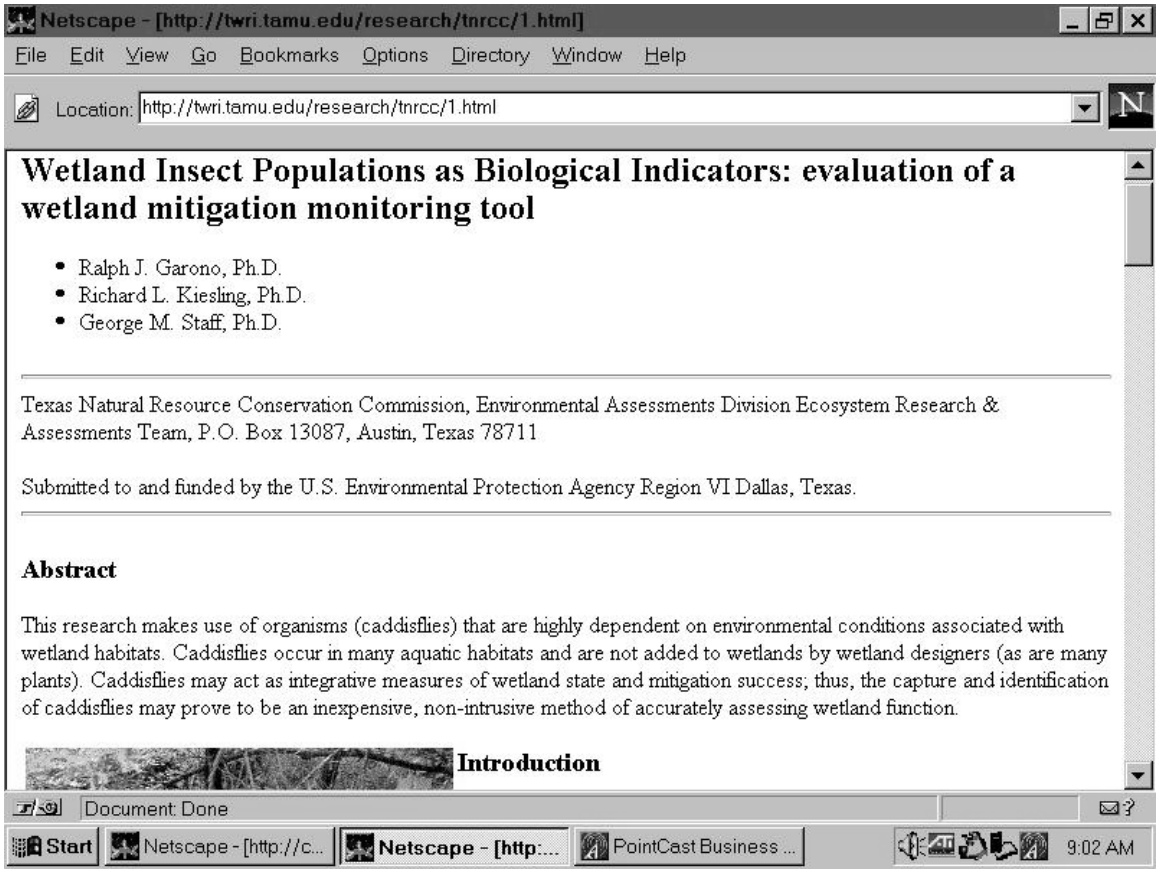

Figure 4. Resource Web site.

2.4. Catalogue

About 5 percent of the sampled Web sites were categorized as catalogue sites. We define a catalogue site as one whose primary purpose is to facilitate ordering of products or services as an electronic equivalent of a paper catalogue. It differs from brochure sites in that it is more extensive in the amount and detail of information and the functionality available. Figure 5 is a screendump of a catalogue-type Web site.

The content of these sites is a list of products and services, with details.

The form is typically a hierarchy.

The functionality includes browse, search, e-mail inquiry, on-line inquiry, and on-line ordering. Of these, about half were standard replicated catalogues but the other half used the media to provide order capability on-line for the user. One of the sites provided full banking services to its customers.

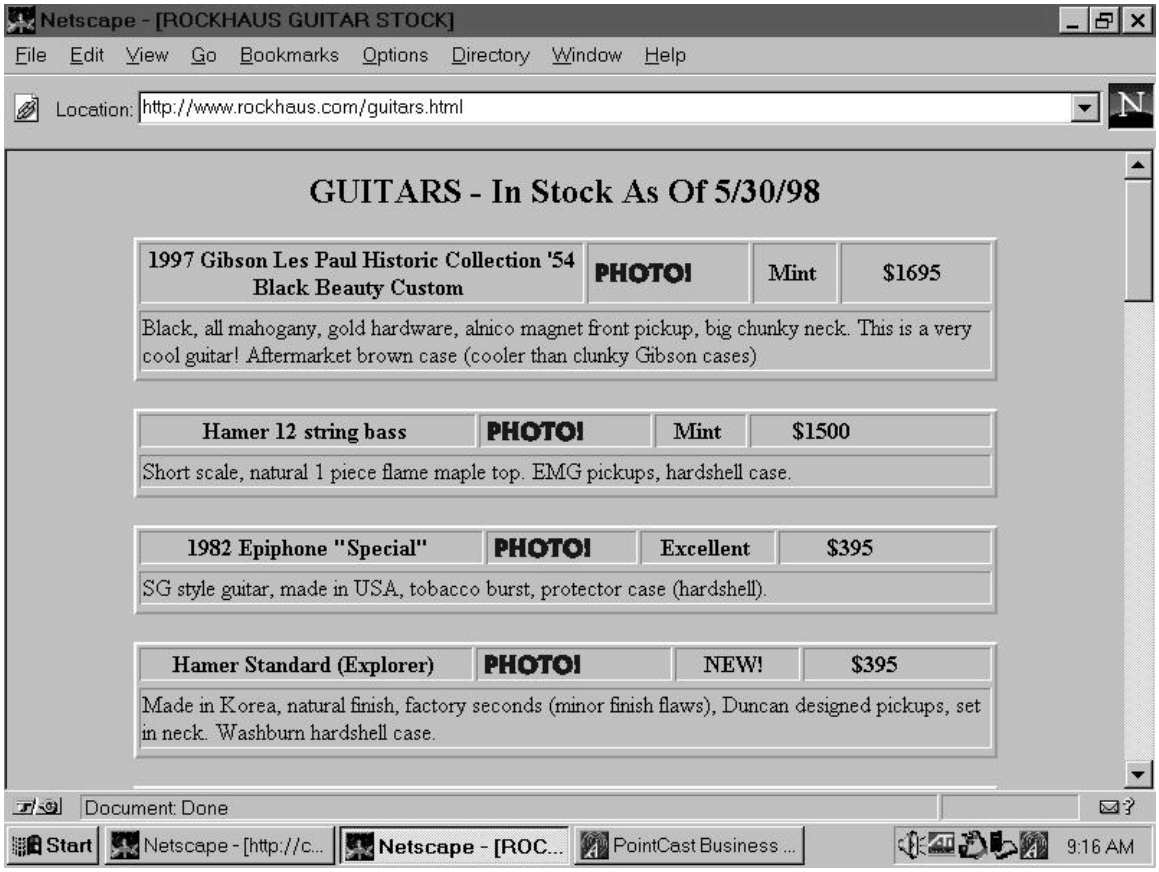

Figure 5. Catalogue Web site.

2.5. Search Engine

The purpose of these sites is to help the user find information on the Web. It differs from a resource site in that a resource site normally has one type of information (medical, whales, etc.) and most of that information is at that site, whereas a search engine has no information stored at that site other than indices and pointers to other Web sites. The search engine indices are built from sites all across the Web and cover whatever subjects and Web pages might be found on the Web.

The content of a search engine might include a hierarchical classification of the Web sites indexed. The results of the user query is a virtual document containing the URLs as links, titles, and a few words about each Web site that the engine calculates might contain the required information.

The form of a search engine includes a form for entering a user query, and a list of information about sites that might contain the required information.

The functionality includes a high level of interaction. The user inputs a query, scans the returned lists of URLs, and browses to these sites. This is normally an interactive procedure with the user modifying the query on the basis of intermediate results.

2.6. Game

About 3 percent of the sampled Web sites were categorized as games. The purpose of these sites is entertainment. Usually, these games are war games, maze games, or some type of skill testing game.

The content includes some type of challenge to the user, presented in a scenario.

The form includes animation, audio, and video. It usually includes many different changing "scenes".

The functionality is highly interactive. This may include games in which people play against the computer, against each other, or play collaboratively against other players or against the computer.

3. Summary and Discussion

Table 2 summarizes the values found for the content, form, and functionality attributes of the six cybergenres.

Table 2. Summary of attribute values for the six cybergenres.

Cybergenre	Content	Form	Functionality
Home Page	information about person/company	introduction hierarchical images animated images	browsing e-mail
Brochure	products and services	shallow hierarchy high-impact visual	browsing e-mail
Resource	subject-specific information	hierarchical images video audio	browsing e-mail search discussion interaction
Catalogue	products and services	hierarchical images	browse e-mail ordering & inquiry search on-line ordering on-line enquire
Search Engine	categories of sites URLs	query box list of sites virtual document	browse search
Game	challenge to user scenarios rules	animation audio video scenes	high-level of interactivity collaborative computing

In 1997, Crowston and Williams [1] examined 100 Web pages with the intention of looking for reproduced and emergent genres. On the basis of form and purpose, they identified 48 different genre, but at a much lower level of abstraction than we have done. They identified no search engine or game genres. The results of a cursory mapping of these 48 genre into our 6 cybergenre was done with the results shown in Table 3. The column headed "S & W" represents the proportion of each cybergenre in our sample of 96 Web sites. The column headed "C & W" represents the proportion of each cybergenre after mapping the 48 genre of Crowston and Williams's into the 6 cybergenre.

Table 3. Comparison of proportions of cybergenres.

Cybergenre	S & W	C & W
Home Page	0.40	0.10
Brochure	0.17	0.06
Resource	0.35	0.82
Catalogue	0.05	0.02
Game	0.03	0.00

Although this was not done statistically, there appears to be significant differences in the proportions of each cybergenre from the previous work of Crowston and Williams to this research sample. These differences may be due to a number of reasons; we may be incorrect in our mapping of Crowston and Williams's genres to our cybergenre, the sample sizes are too small, and/or there has been a shift in what is happening on the Web since their study two years ago. While we believe that all of these have influenced the results, there has certainly been a terrific change on the Web over the past 2 years and we believe that this has probably had the most influence.

Upon analyzing the results of this survey of Web sites, we find the following:

- there are actually relatively few classes of cybergenre on the Web
- about half of the Web sites samples are business related
- functionality is an integral characteristic of cybergenre
- functionality in cybergenre is evolving; the game cybergenre features sophisticated multimedia effects and collaborative computing, users can sample products such as audio and software, users can perform the entire ordering process on the Web.

While we recognize that the functionality offered by the Internet is not yet fully understood or fully developed, we suggest that designers of Web-based applications and Web sites should be aware of the functionality attribute of cybergenre and, in the same way they design for content and form, they should design for consistency of functionality within the cybergenre.

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