

A Research of Information Architecture and Design Methods for Academic Society's Website

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ABSTRACT

In Japan, there are currently more than 600 academic societies and most of these societies do not have their respective websites developed by professional web-masters. In many instances, there is a lack of clearly understandable information architecture and methods of website design are generally weak. In recent years, a number of useful web-developing software applications have been simplified and many complicated tasks cannot be completed without the expertise of system engineers. The authors attempted to conduct a research on many academic societies relative to how these societies deal with information architecture and related design methods. We have developed a model website and have proposed an ideal website prototype so that members of other academic societies may explore the model in the developments of their own websites in accordance with their own needs.

KEYWORDS: Academic Society's Website, Information Architecture, Top Page Design

1. INTRODUCTION

As we know well, in the information age, companies and organizations, such as academic societies, depend upon their websites to convey to the outside world about their ideas, concepts, products, and services. It is increasingly important for academic professionals to make use of Internet to communicate with members of the same society. Their society websites, therefore, serve as indispensable and effective media for promotional functions. In Japan, there are currently more than 600 academic societies presenting their websites [1], however, most of these societies do not put their websites to practical use and do not make full use of the information they have for their own members and others who may be interested in the activities provided by these societies. Furthermore, many of these societies have difficulties in managing their News Letters, study

materials even when advanced technologies are prevalent in the contemporary society.

There are many review articles about developing University website [2]. For example, Grant R. Pogosyan has encountered many dilemmas and problems, he eventually found particular solutions. As we all know, the information and related data of an academic society could be very useful to the people who are seeking new inventions, study materials, and so forth. In other words, the data and information available from an academic society need to be made available to the general public through a nation-wide network [3].

In this paper, we have researched information structures and methods of website designs of many foreign academic societies on the bases of their available websites and we have re-structured and re-designed the VRSJ (Virtual Reality Society of Japan) website as a website prototype/model. This paper is to

report the results of our research and to evaluate some model websites. Our goal was determine how effective these respective model websites benefit the society administrators, members, and general audiences.

2. ELEMENTS OF WEBSITES

2.1 General Functions

"Understanding begins with arranging" is a famous statement by Hayden White who is an honorary professor of literature at the University of California-Stanislaus. Disorganized information confuses users; therefore, it is important to arrange and analyze this type of information properly. There are four ways to accomplish the task: (1) information structure, (2) navigation system, (3) labelling system, and (4) database system [4].

First of all, we have conducted a survey of the website of thirty academic societies and concluded that although there maybe different labels/names used for menus and sub-menus of these websites, the meanings of there different labels/names are virtually identical. Differences in terms of the labels/names used in the websites create unnecessary confusions and discourage general audience members who might want to know more about a particular academic society and its related activities. However, the contents list would show a certain frame of menu category that is linked to expect or similar contents (Table 1).

Table 1. Examples of similar contents labels/names for general academic society's website menu

Common Names	Other Wording
Outline	History, What's~, About~
Regulation	Rules, The Articles of an Association, Provisions,
Admission	Apply for Membership, How to Join~, Official Procedures
Member List	Name List, Member/Executive Members
News letter	Articles About~, Journal

2.2 Information Architecture

Figuratively speaking, a website is an architecture form. All data and information are grouped in different stages and website visitors would go through these stages just like building inspectors explore the inside of buildings when they want to know about the development of an academic society's website.

In public media, an academic society's website, is common property to everyone. Therefore, it is probably better to build a general architectural plan for the basic information structure of academic society's website and then add the original selling point; information and entertainment within the basic structure. Based upon the research, we arranged the category and menu labels/names broadly, and we have decided to categorize these basic menus into four categories and other functions (Table 2).

Table 2. Restructured the contents for general academic society's website

Information	Outline, Regulation, Admission Member List, News Letter
Activity	Forum, Contest, Workshop, Conference
Research Committee	About Research Group, Committee Names
Monograph/Product Information	Apply, Rules, Monogram/Product
Other Functions	Contact Us, Search, New Information, etc


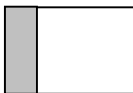
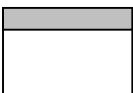
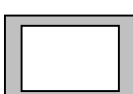
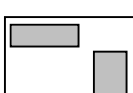
In general, the contents of a website can be explained by using four parts. The in-depth information and data of an academic society vary with the color of the society and the field of its activity.

3. TOP PAGE DESIGN

On the basis of our research, we have all top-page layouts of the websites of thirty academic societies organized in five major styles, using the basic rule for Web Design and the ratio of the academic society's

website style [5]. There are, (1) Fill Style, (2) Left Shoulder Style, (3) Top Index Style: Navigation buttons/bar are placed top and contents are below. (4) Picture Frame Style: Contents placed in the middle and navigation buttons are arranged the edge of the window, and (5) Satellite Style, and Left Shoulder and Satellite are common style for academic society's website [6].

Table 3. Five major styles of Japanese academic society's website

Style and the Website Images	
1) Fill Style: No blank space or separation between contents and navigation buttons.	
2) Left Shoulder Style: Navigation buttons are placed left side and contents are right side.	
3) Top Index Style: Navigation buttons/bar are placed top and contents are below.	
4) Picture Frame Style: Contents placed in the middle and navigation buttons are arranged the edge of the window.	
(5) Satellite Style: Navigation buttons and contents are grouped in some place, but not anything in fixed place.	

We also researched the image of the site which viewers receive from the website layouts using the same images/texts for each types. The volunteers were eighteen academic society's members, four students, and twenty outside people. We asked them to express the website images in simple words and to study how the top page design influences on the subjective image. According to the research, on effectiveness of various styles of websites, the Fill Style is considered unadorned and unappealing to most of the viewers. Although the Satellite Style provides some individuality, it is difficult for viewers to organize the contents and to have a casual image. Most of viewers did not recommended the Satellite Style to the academic society's website. A academic society's webmaster once stated that viewers often had to reorganize the contents or update the text

when they make use of a website of an academic society. The Satellite style would result in unnecessarily long pages for viewers. However, the Satellite style was used by 33% of all academic societies (Table 3).

The top page design is like a main entrance to a building. Therefore, it should be able to show the main points without a long pause. However, the Satellite style and Picture Frame Style tend to make it too hard to make the points. On the other hand, Top Page and Left Shoulder Style are more business like, and do not waste space image. Their users think positively because they can easily find the menu and the contents.

The difference between these styles is the space (width) for the texts. Academic Society's Websites contents are mostly text data and the web-browsers need to make sure there is enough space for it. Therefore, we concluded that the Top Index Style is the best style for academic society's websites. Although it was used only 10%, we recommend the Top Index Style instead of 33% of the Satellite Style.

4. MANAGEMENT

We sent out questionnaires to twenty academic societies to study their website administrating, and we received nineteen answers. According to the survey, there are five major types of management systems for an academic society's websites and most of academic societies website run by volunteers and most of them are not professional web designers (Table 4).

Table 4. Management system for academic society's website (2001)

Member who is familiar with website development	10%
Website development committee	40%
Partial responsibility	20%
Take turns and partial responsibility	10%
Outside (Student, Web Designer, etc)	5%
No response	5%

They prefer to have a low cost and easy website managing systems, especially for Member Lists, News

Letters, and Monogram/Work. This information are indispensable, but most webmasters have a tough time sharing the updated work and struggle with manually managing previous data. There is a demand for useful online managing systems, but it needs to be relatively easy to handle for the people who just being introduced the world of databases.

PHP and MySQL are ideal combination for creating data-driven academic society websites and can be useful element for general academic society websites. MySQL is a small, compact database server for small applications, and the PHP is a server-side scripting language which script is processed by the Web server. Both are free applications and interaction allows for complex operations [7].

5. STUDY OF EFFECTIVE WEBSITES OF ACADEMIC SOCIETIS IN US

In most cases, a college/university has one or two instructional designers who have appropriate background, training, and experience. Those staff help the academic society members, mostly faculty, to develop a website. Regarding this system, there are a number of society websites in the US actively up-to-date and some of the websites contents are not only for the members in academic society, but also for outside people (Figure 1, 2, 3).

We have studied of the three examples of effective website among general academic websites in the US and made use of the idea/functions for the prototype/model website development. Figure 1 is an example of a website which provides teacher materials for social studies. This is an example of sharing the information/research result through the academic society's website [8]. Figure 2 is an example of a site map. This function is uncommon for the Japanese academic society's website [9]. Figure 3 is an example of sub-information. The sub-menu "See Also" invites to the viewer to see other articles that relate to main contents on the current page [10]. Those systems and functions are uncommon for Japanese academic society

however, ideas are useful and those ideas are technically available for all academic society. It is better to incorporate into the website projects as well as the web designers and engineers for each University.



Figure 1. Teacher materials



Figure 2. Site map



Figure 3. See also

6. GUIDLINE FOR ACADEMIC WEBSITE

6.1 Procedures

We carefully researched and analyzed the academic society's websites in terms of their respective information architecture, design methods and administration systems. In this study, we have described uses general and basic-level to create an academic society's website. However, if more advanced websites are not created, they will never find their way to better levels.

The point taken most serious part was design a well-balanced academic information architecture for the Web site. However, we found that it was difficult to force the really same way of classifying the information to all academic society's, as well as the point that the outline of writing of the thesis varied in the academic society. In this paper, we successfully presented the information design for the general academic society's website as a main subject, and the following points are proposed for

the future development of academic society's websites.
 (1) General academic society's information should begin simply structured five categories. Those are Information, Activity, Research Committee, Monograph/Work and Other Functions. (2) Select a suitable the top page style or layouts bear the academic society's image. (3) Develop a management systems for long term website maintenance. We previously introduced the freeware and systems in a University in the US. (4) Incorporate the ideas from International viewpoints. Academic websites can be more aggressive and effective websites. Expanding their horizons and selecting the website contents from many aspects.

6.2 The Development of a Model/Prototype Website

The VRSJ has website a development committee that manages the information on their website. Their formal VRSJ website is a typical example of a current academic society's website and had general weak points and problems [11] [12]. There were seventeen menus for navigation and using the Left Shoulder Style is used. It has three frames and some pages have five frames in one page.

We reconstructed and redesigned the VRSJ website based on the research and study[13]. First of all, we categorized the menu into four, and other functions based upon the original data. It was incorporated into the new format without any losses (Figure 4).

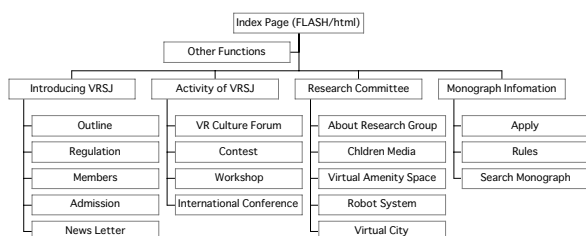


Figure 4. New VRSJ website flow chart

We reviewed the VRSJ data of the formal website design and also considered about the society's image with the members. Finally, we proposed a business like image with Top Index Style for new VRSJ website and offered entertainment for the top page and a handy

system for frequent maintenance work. We have developed two types of top page design. One is a Flash (animated) version and the other one is an Html version. This interactive animation is custom developed for the VRSJ that is three-dimensional design and changes the sky in accordance with time. For those who did not have the Flash viewer or prefer to brows the Html version, user can select one of those versions. The selected version is automatically saved and the user does not need to select the version of the site. Also, it can be switched to other version manually.

Incorporating new ideas for the top page design is entertaining to the user and appealing to the VRSJ. Sub pages keep the top page atmosphere and are used in Top Index Style as well. This is a unified the website Design (Figure 5, 6).



Figure 5. Top page design (Flash) for new VRSJ website



Figure 6. Sub pages for new VRSJ website

Furthermore, we build a handy system for frequent maintenance work and for Monograph, News Letters and Members database. It developed by using PHP and MySQL as this system was also highly recommended by the webmasters from academic societies, including VRSJ office workers.

7. EVALUATION OF PROTOTYPE/MODEL WEBSITE

We conducted an evaluation of the website in line with the guidelines of Usability Testing (UT). The testers were two University faculty members, three students and five outside people. The testers explored the new VRSJ website and evaluated it in terms of the efficiency of the website [14]. We interviewed the testers in order to correct the data for the future modification of the website. According to the UT results, eighty-five percent of them were able to reach to the targeted page without a long pause or getting lost in the process.

Although we have prepared two versions of the website, Flash and Html, fifteen percent of the testers still have suggestions for the three-dimensional animation. They have stated the animated navigation takes time to get used to and a frequent user might easily get tired of moving shapes. Indeed, it is not necessary for us to have a website animation contents directory, though we may need to have more case study to assess the effectiveness of the splash-page animations. For now, we have developed the Quick Access menu for the animated (FLASH) version and text (html) version. Though the present website is the stage of the test management, too, it proceeds with the adjustment work in the VR academic meeting board of directors bureau and the WEB committee.

The effectiveness of a website cannot be described in a sentence or two. However, the overall evaluation of the prototype/model website was positive. We also received good feedback from the test users in terms of the layouts and less menu choices. One of the testers stated, "It is about the right number of menu on the top page and I know when and where I am, because the top index bar changes the sky color and shows the sub-pages menu names." The other tester was interested in the monograph search systems and online contribution, and commented that this system could lighten the Society's office work. It is also relative to such other functions as Search, Site Map, and New Information similar to the examples found in our study of selected

academic society websites in the United States.

8. CONCLUSIONS

When Internet was the only tool for scientists to communicate and to manage complex information, they had nothing fancy to work with but their reliance on hypertext. Nowadays, with the rapid advancements in information technologies and increasing demands for more information at a faster speed, a website becomes an important way of communication among members of an organization and a tool for the organization to communicate with the outside world. A website is now used by an academic society to construct and to provide a complex network of data and information for its members and for general audiences.

Although, computer operation skills and design tastes are indispensable to the website development, the benefits they bring to the assessment and convenience are different. In this study, we attempted to take a fresh look into the websites of selected academic societies in the hopes that a more user-friendly website model could be developed. We have successfully produced a generic website prototype. The procedures we have suggested can be replicated are the future development of architecture information and design methods of all academic societies, such as the general structure and the relation between text volume and interface layouts. Therefore, we sincerely hope that the study has made some contributions to the increasingly popular use of the information, study materials, and activities made available by all academic societies.

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References

- [1] Academic Society Home Village,
<http://www.soc.nii.ac.jp/index.html>
- [2] Miho Matsumoto, Study on Representation Method in Digital Media, Proceeding of JSCS, Vol.9 pp 68-71, 2001 (In Japanese)
- [3] Grant R. Pogoyan, A Webmaster's Perspective: Developing a University Website in Japan, NIME International Symposium, 99
- [4] BiBit, and Toshikazu Shinohara, Web Usability Rule Book, pp72-81, Impress Communications, 2001 (in Japanese)
- [5] Phyo, Ani., Web Site Workflow: Information Design in 5 Simple Steps. '01, Addison-Wesley, 2001
- [6] Hiroyuki Uchida, "Basic Study of Web Design", Visual Design Lab, pp. 66-83, 2000 (in Japanese)
- [7] Graeme Merrall, PHP/MySQL Tutorial, <http://hotwired.lycos.com/webmonkey/databases/tutorials/tutorial4.html>
- [8] National Council for the Social Studies, <http://www.ncss.org/resources/home.html>
- [9] American Academy Arts & Sciences, <http://www.amacad.org/>
- [10] Inter-University Consortium for Political and Social Research, <http://www.icpsr.umich.edu/>
- [11] Ootake Kazuya, and Morzumi Kiyotaka, Design Research of an Appropriate Representation for the Purpose of a Web Site, Proceeding of the 48th Annual Conference of JSSD, Japanese Society for the Science of Design, pp. 236-237, October 2001
- [12] Jakob Nielsen and Marie Tahir, Homepage Usability: 50 Websites Deconstructed, New Riders Publishing, 2001
- [13] Miho Matsumoto, Shigeki Yokoi, Takami Yasuda, A Research of Information Architecture and Design Methods for Academic Society's Website, The Society of Art and Science, Proceeding of NICOGRAPH International 2002, pp 91-96, 2002
- [14] Mark Pearrow, WebSite Usability Handbook, Charles River Media Inc, pp.198-203, pp. 288-309, 2000