JAPAN WINDOW
A US-Japan Internet/WWW Collaboration for Japan Information

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Abstract

This paper provides the international Internet/WWW community with the first post-debut update on Japan Window's progress and plans for information content, technical features, research objectives and information provider/user participation. Japan Window can be viewed at the following URLs: (http://jw.stanford.edu, http://jw.nttam.com).

1 Introduction and History

The *Japan Window* project is an Internet/WWW research collaboration of Stanford University's US-Japan Technology Management Center and Nippon Telegraph and Telephone Corporation (NTT), under the sponsorship of Smart Valley, Inc.. Officially released to the public on March 1, 1995, *Japan Window* is an experiment in organizing and building country level information on the Web. It relies extensively on experience gained in the first-generation NTT "Japan Information" and Stanford "X-Guide to Japan Information Resources" Web sites created in 1993-94 [1]. The *Japan Window* Team seeks to improve Japan information access and US-Japan exchange and communication on behalf of the US user community. Portions of this paper are excerpted from our first conference paper, presented in Chicago [2].

Graphics by J. Hong, Stanford University

Figure 1: *Japan Window* Homepage

2 Project Objectives

Japan Window's principal objective is to grow a network of distributed and integrated Web sites useful to US corporate, academic and government organizations in their daily US-Japan activities, be it hi-tech R&D, product development, electronic commerce, export promotion, or technology management and policy. This is achieved by concurrently developing 1) new and timely science, technology and business information sources in Japan for the US high technology community, and 2) unique and innovative Web site automation and human/computer interface features and techniques. Once fully developed, *Japan Window* could serve as a model for US-Asia information exchange in many areas of mutual interest.

3 Response from the Target User Community

Since its March release, *Japan Window* has been well-received within its primary target audience (US-based organizations) as well as by Japanese and world-wide users. Major US user communities targeted include high technology industry, particularly in Silicon Valley; regional and community Japan societies; researchers at government, corporate and university laboratories; and US government agencies.

User access statistics are broken out as follows: US (35%), Japan (35%) and Other-World (7%) as in Figure 2. Unresolved domain names account for the balance. Daily accesses average an estimated 1,200 users (13,000 "hits"). As of April 28, more than 500 individuals have joined as *Japan Window* members, mostly from the United States.

User responses and informal surveys indicate the following relative preferences for content areas: Travel and Working, Kid's Window, Government, and the Events Calendar. Extremely valuable user feedback is received via the User Comments section; *Japan Window* servers receive about ten valuable comments on content, formatting, and collaboration each day.

The *Japan Window* Team is now giving presentations and briefings to prospective user groups and information provider organizations in the US. A planned User Committee will ensure that Web site users' feedback is systematically incorporated into the site design and testing on a regular basis.

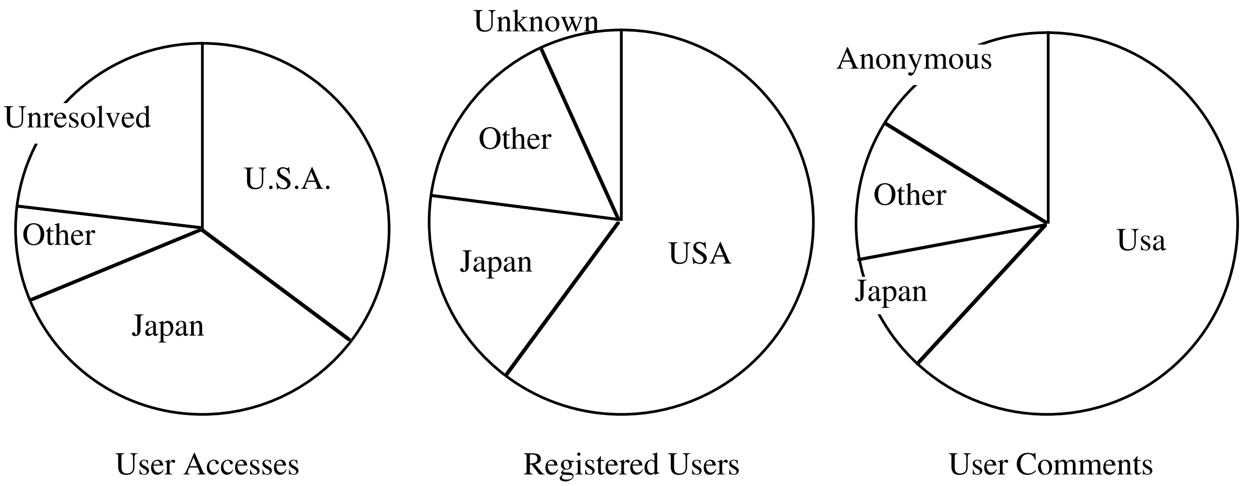

Figure 2: Breakdown of *Japan Window* User Access Statistics

4 Information Content

Japan Window aims to 1) provide improved access to Japanese information content for US users, and 2) develop the US user appetite and demand for Japan information in specific selected domains. To date, Japanese government and industry efforts to provide Japan-information for the US market have met with generally unenthusiastic responses from American users. We believe that this is due to:

- difficult and sometimes cumbersome technical access methods to Japan-information sources
- poor human-computer interface design of information systems

- unimaginative packaging and bundling of information content
- inadequate understanding of the US market for Japan-information, leading to overestimates of market size and breadth
- high costs to the user

Content Strategy. The *Japan Window* information content strategy is, therefore, structured to address these problems by investigating alternative approaches directly with US users. We aim to attract the casual browser of Japan-information, as well as the more serious, repeat user who frequently needs in-depth information in one or more subject areas.

Our content strategy mixes daily dynamic information with relatively static information, so as to appeal to a broad base of users with varying Japan-information needs. The casual user will be more likely to access *Japan Window* for the daily updates; once at the site, he/she might be inclined to check out the government or other subject area sections.

As presently conceived, *Japan Window* information content will focus in the following major information categories and features:

Current Subject Areas

- Japanese Government information
- Japanese Science and Technology
- Japanese Business, Economics, Finance
- Travel, Living and Working in Japan
- Daily Updates
  - NTT What's New, News items and numeric indicators
- *Kid's Window*: fun things for K-12 children to browse
- Bi-lingual (English-Japanese) presentation

Japanese Government. English-language Japanese government information is among the first major subject areas released by *Japan Window*. The government collection covers not only central government information but also local government information, including selected prefecture pages and city pages. Notable here is the first Experimental Web Site of Japan's National Diet, House of Councillors, made available to *Japan Window* under a separate Stanford-Diet research relationship.

In each area, users can find background descriptions of various government organizations along with its current activities and policies. To encourage these regional activities further, we are planning to identify sister state-prefecture and city-city relationships between the US and Japan.

Current information providers here include the Japanese National Diet - House of Councillors (via Stanford), the Osaka Prefectural Government, and the Japan National Tourist Office (via NTT) (Figure 3).

Japanese Science and Technology. Japanese science and technology information, in English and Japanese, will be an important *Japan Window* subject area. Domain and discipline areas currently under long term development include Japanese manufacturing, environmental and energy technologies, biotechnology, and telecommunications and computer networking R&D information.

It is our hope that US and Japanese governments and companies will support and use this section as we seek to develop and open up the exchange of Japanese technical information.

Japanese Business and Finance. Japanese business, economics and financial info is a third important subject area currently under development. Many users comments received to date include a strong desire for this class of information. Ideas under discussion include daily news features, economic forecasts and performance reports, and Japanese company profiles. It is intended to be a useful information source for persons interested in finding out how to invest in Tokyo stocks or how to set up a computer software firm in the Kansai region, for example. We hope our research will build a foundation for balanced US-Japan international commerce on the Internet.

Travel, Living and Working. The "Travel, Living and Working in Japan" section includes practical and useful information for Americans who plan to go to Japan. At present, visitor information is provided for Tokyo, Osaka, Kyoto and Nara. In addition to general information, *Japan Window* will provide detailed maps and guides to important regions in Japan. Whenever practical, we hope to assist users with the preparation of overseas travel by indicating how to fill out official forms, and how to "get around" once landed.

Current information providers here include the Japan National Tourist Office (via NTT), and the Osaka Prefectural Government.

Kid's Window. *Kid's Window* is designed for non-Japanese children to learn about Japanese culture, and language, and to become friends with each other. Many images, such as illustrations and photographs, are used with visual effects to attract children and keep them interested.

Analysis of two months users' access statistics shows that *Kid's Window* is a very popular site both for children and adults. By browsing this window, children will be exposed to a world very different from their own. As the children explore, they may discover that children in Japan share similar interests, dreams, etc. The purpose of *Kid's Window* is to serve as a communication bridge between children in America and in Japan. It is expected to promote understanding and appreciation of each other.

A. Yamazaki and K. Kada originated the *Kid's Window* site. Current information providers include Stone Bridge Press of Oakland, CA.

Daily Updates. User comments strongly indicate that daily news features, provided in several formats, are essential to satisfying *Japan Window* members' and other users' desire for current and timely information from original news sources. The NTT "What's New" pages, mirrored daily from the NTT-Tokyo Web site (provided courtesy of NTT), are the first of several such critical information resources updated on a 24-hour basis. A keyword search capability is added for all news information at *Japan Window*, which is now one of the most useful functions for daily users. We are also examining mechanisms to receive news feeds from various information provider organizations on an automated basis.

Bi-lingual Content.*Japan Window* will be bi-lingual (English-Japanese) whenever practical. Although our primary focus audience is the US user community, current access statistics (see Fig. 2) show one third of user accesses come from Japan, demonstrating a strong need for Japanese language content. Original Japanese-language sources are not easily available in electronic form, however, which oftentimes severely inhibits placing Japanese text on-line.

5 Research Objectives

Japan Window seeks to investigate the following issues of particular interest to the US-Japan and WWW/Internet communities:

- Web Site Automation
- User Interfaces
- Content Standards for Japan Information
- Bi-lingual Computing
- US User Community Market Research
- Japanese Technology Management
- Japan-US Intellectual Property Practices

Web Site Automation. Automation of Web site maintenance for system administrators and information providers is essential. Our objective is to off load much of the daily and repetitive administrative burdens from system operators, but also to give *Japan Window* content providers a secure mechanism for directly customizing and managing their own information from remote locations (see also Section 6.0).

User Interfaces. Human-computer interface (HCI) research objectives are aimed at developing new user features to 1) improve Web site utility and efficiency per client visit, and 2) maintain user interest over the long term. These features include database and Web site search and retrieval, cartographic map-based navigation, bi-lingual information display, database update/display for different user groups, interactive forms, secure pages, daily utilities and updates (such as Yen rate and graphics swapping), user-specific features, and shopping/electronic commerce.

Content Standards for Information. The project seeks to encourage and develop minimum standards and benchmarks for the dissemination of publicly-available information by Japanese organizations to US and other users. We have adopted "homepage templates" in an effort to encourage Japanese organizations (particularly companies and government ministries, agencies and related organizations) to provide information in important content areas, user-friendly formats and access methods suitable for US and other non-Japanese speaking users (see Figure 3). Early cooperation with leading Japanese organizations during their Web site design is essential to the success of this initiative.

Graphics by J. Hong, Stanford University

Figure 3: Government Ministries Page

Bi-lingual Computing. The integration and maintenance of large bi-lingual databases is an important area of on-going investigation. American users and companies also need to be educated in the use, dissemination and benefits of multi-lingual information. NTT's main Web site (http://www.ntt.jp) is bi-lingual, and provides an experiential basis for expanded US applications here.

US Market Research. Relatively little is known about the US market for Internet-based dissemination of Japan information. The project is collecting detailed user statistics, and will analyze these on a regular basis to determine patterns of usage to assist in on-going site design and expansion. Certain statistics will be furnished to eligible information providers in Japan. Such market analysis is essential if we are to understand how content and format is best presented to US users for their maximum benefit.

Japanese Technology Management. Building and maintaining this dynamic Web site provides an excellent platform for the investigation of important Japanese technology management research issues: the impact of the Internet on technology management practices in Japanese government and industry; information, computing and networking usage patterns in Japanese organizations; and Japanese national information infrastructure (NII) management and development.

Intellectual Property Rights-Japan. Ongoing discussions with many different types of Japanese information providers raise fundamental questions regarding the treatment of intellectual property under Japanese law and business practice. Copyright limitations on Japanese government publications content and their translations, for example, are generally much more restrictive than in the United States. Publishing of government information is frequently carried out by small private publishing houses closely associated with a particular ministry; agreements to put such information on the Internet must thus take into account not only the ministry's position, but also the copyright and profit positions of the firm. Copyright issues, the diverse structure of the Japanese publishing industry, and attitudes regarding the open dissemination of information are a rich domain for legal research, and pose ongoing challenges to the project Team's efforts to develop new information sources.

6 Technical Approach

The INET conference presentation will demonstrate technical innovations which the *Japan Window* Team is presently developing. These include some of the following:

Major Technical Features

- Community-serviceable databases modifiable by *Japan Window* users
  - Japan Events Calendar
  - Jobs Board
- Multi-Server Coordination
- *Japan Window* "Cockpit": Web site automation for:
  - System Administrators
  - Information Content Providers
- Database Management System (DBMS) infrastructure
- Custom User Interfaces
- On-line Discussions

Community-Serviceable Databases. *Japan Window*'s research and development of community-serviceable databases - via the Japan Events Calendar - has been highly successful, and now provides an important US-Japan community service. Based on positive user inputs, we expect to build on this paradigm to expand the variety and functionality of these self-maintaining on-line community "bulletin boards".

Japan Window attracts a large number of organizations and members who wish to share their monthly activities with the larger US-Japan community. Ongoing management of such new and dynamic information quickly becomes a challenge for site administration staff, however, such that *Japan Window* has turned to community-serviceable databases as a possible solution. This approach is also being taken at Stanford's Mechanical Engineering Department for vendor information management [3].

The Japan Events Calendar. The Calendar lists Japan-related events in Japan and the US, and includes information on the event date, time, location, contact info, and a short description. Users can search the events database by keyword, date, sponsor location and/or location.

Our current prototype is implemented as a custom CGI-database using TclX. The interface model for the calendar is that of a filtered list which allows screening of events by date, information source, and location. WAIS search is also possible via a calendar script which automatically generates HTML files/ To deal with the dynamic nature of event information, all calendar pages and input forms are "virtual" pages generated on the fly.

New Services. We anticipate that there are several classes of information amenable to the application of community-serviceable databases, and which can be offered with a relatively simple port of code from the existing Events Calendar. A "Japan Jobs Wanted/Offered Board" comes to mind here as a potentially useful expansion of such community services, for which there exists strong and broad-based demand by US and Japanese users.

Access Modes and Maintenance. Viewing of calendar events is accessible to the general public. Editing of calendar events, however, is restricted to *Japan Window* members, through password access. New members can sign up and set their passwords through an auxiliary forms interface. Once a member logs in, they are only allowed to edit events sponsored by themselves. In this manner, everyone can contribute to the database without accidentally jeopardizing another party's information.

In spite of our intentions to have the community maintain this database as a shared resource, problems are bound to happen, and a Web-based backdoor has been provided for carte blanche staff editing. A "staff" interface has been implemented as a third mode of access for the *Japan Window* Calendar.

Multi-Server Coordination. Several sites in Japan are exploring concepts somewhat similar to *Japan Window* in the area of dissemination of general Japan information. The Japan Center for

Intercultural Communications (JCIC) (http://www.jcic.or.jp/) and "The Kaleidoscope of Japan" (http://www.aist.go.jp/Htmls/JPIHome.html) are good examples of active servers in this regard.

As Web servers carrying general Japan information proliferate, we can expect much information to be redundant and perhaps not well-categorized; this can be inconvenient for users. Multi-server coordination technology thus becomes increasingly important for growing a Japan-related information network. Such Web sites must be partners of *Japan Window*, and not competitors.

One way to coordinate across multiple, distributed servers is to utilize a "relaying server" which stands between the information provider servers and clients, in a proxy and delegate relationship. The relaying server takes charge of common functionality, such as language translation, character conversion and search capability, such that the "main" servers may then concentrate on providing information content. This architecture can be advantageous in offering users common interface formats and functions; information providers, in turn, can focus on putting their content on-line without duplicating costly interfaces.

Web Site Automation. *Japan Window* is migrating its underlying technical infrastructure to support a high degree of automated interactions with information providers, member users, and system administrators. This is essential to off loading much of the daily and repetitive administrative burdens from system operators, but also provides content providers and users with interesting possibilities for customizing their Japan Window interactions.

The *Japan Window* "Cockpit" page, presently accessible only to authorized *Japan Window* site administrators, provides a single point-of-entry and centralized control board for running site operations such as database updates, status reports, question and comments answering, user access statistics, WAIS administration, mirror arrangements, etc.. Eventually, we anticipate that system administrators will use the Cockpit interface to perform additional functions, such as sponsor account creation and maintenance, for example.

The "Information Providers Cockpit", once fully developed, will permit the individual content provider to directly control and monitor usage of its remotely-archived content. Intermediate scripts provide this functionality, but screen all providers from any direct interaction with Japan Window site directories, files, or the operating system, thereby ensuring that system administrators maintain a controlled, uniform and reliable systems environment.

Each provider will log-in to its own proprietary Cockpit homepage, and then select/specify appropriate administrative functions to execute at specified intervals. This might include: uploading new files into the proper *Japan Window* directories, specification of access control restrictions on particular files, and running of site statistics on the new pages. This arrangement reduces support staffing required at the main *Japan Window* office, and gives the content provider a high level of continuous interaction with the *Japan Window* project.

We recommend that Web sites with complex information content, and multiple providers, adopt this approach and automate as much as possible of their operations. Secure Web servers, and document management database systems are needed to implement these "Cockpit" concepts.

Database Management Systems. *Japan Window* presently utilizes flat files for management of its Events Calendar and other databases. Long-term growth and maintenance of large-record community databases, however, strongly suggests that our Web sites migrate to coordinated relational or object-oriented database management systems (DBMS). The DBMS platform offers additional reliability, system and records size expandability, and increased flexibility in the design and integration of new user services. We also consider bi-lingual database management an important area for future Internet/WWW technology development and research.

Custom User Interfaces. Since *Japan Window* is aiming at the high end user, with a high level of repeat usage, we are currently considering the benefits of "customized" pages for particular users. Once the user has registered, *Japan Window* would provide pages and links which match best with that user's interests. For future "logons", *Japan Window* recognizes the domain name, provides a welcome message and indicates what's new on the system since the user last visited. This increases the efficiency with which the user can obtain information.

On-Line Discussions. On-line "chat" forums promote user-to-user interactions around Japan-oriented subjects, at very little additional cost in time or resources to system administrators. *Japan Window* currently offers a general discussion group, based upon the "Webchat" technology developed by Michael Fremont at the Internet Roundtable Society. Over 200 people have accessed this unique area to meet people interested in similar topics and carry on discussions related to Japan. There is no limit to the number of people who can participate at the same time, and people can even include photographs of themselves and links to other pages to provide extra information instantaneously on topics of discussion. In addition, people can choose to write in both English and Japanese.

In the future, we hope to allow *Japan Window* users to add a picture to our "registry" so that users can conveniently visualize with whom they are speaking. As demand grows, different chat areas will be created for technology, travel, or children-only groups. Finally, our goal is provide users the opportunity to virtually meet and chat with distinguished guests such as famous authors, scientists or business persons.

7 Conclusions and Future Work

The *Japan Window* Team expects to announce several new developments during the second half of 1995. Stay tuned to the *Japan Window* Web sites, and the Yahoo, NTT, NCSA and CERN "What's New" lists for formal announcements.

Organizations interested in learning more about the *Japan Window* project should contact either Stanford University or NTT as follows:

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Japan Window was co-founded by Atsuhiro Goto, Burton Lee, Michael Bayle, and Yasuhisa Sakamoto.

Acknowledgments

The Stanford authors wish to thank and acknowledge the US-Japan Technology Management Center for its support of this research. The Center is a member of the US Japan Industry and Technology Management Program.

Thanks also to Ms. Ayako Yamazaki, *Japan Window* staff, for her valuable assistance in the preparation of associated site user statistics pie charts for this paper. Mr. Jack Hong designed the *Japan Window* graphics shown.

References

[1] Lee, B., Bayle, M., "Internet X-Guide to Japan Information Exchange," in Proceedings of the Workshop on Technical Requirements of Accessing Japanese Information: Problems and Solutions, Library of Congress, Washington D.C., March 18, 1994.

[2] Bayle, M., Lee, B., Goto, A., Sakamoto, Y. et. al., "Japan Window: A US-Japan WWW Collaboration for Japan Information," in Proceedings of the 2nd International WWW Conference, Chicago, IL, 1994.

[3] Hong, J., Toye, G. and Leifer, L., "Using the World-Wide Web for an Engineering Design-Team Class," Proceedings of the 2nd International WWW Conference, Chicago, IL, 1994.

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