'Guiding' the World to Canada's Museums: the yellow brick road or the straight and narrow?

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Abstract

Over two years after launching The Guide to Canadian Museums and Galleries, the Canadian Heritage Information Network (CHIN) initiated the redesign of this collaborative, online resource dedicated to promoting Canadian museums. This project involved more than a simple facelift. It involved interdisciplinary research to define the user interface redesign that might transform the Guide into a significantly more functional, comprehensive, evolving and intuitive resource for the growing range of today's web users. It was also about investigating the new opportunities offered by the WWW to increase the visibility of Canadian cultural institutions; testing and creating contexts for partnerships; and about offering incentives to enhance collaboration. This paper will examine how the research on developing a collaborative service in a dynamic environment impacted the application architecture and interface.

Introduction

The Guide to Canadian Museums and Galleries – renamed The Great Canadian Guide: Your premier Internet connection to Canadian museums, galleries and other attractions! provides a single focal point for many heritage resources, an evolving link across Canada, across time, across cultures.

The Canadian Heritage Information Network (CHIN) initiated the redesign of this collaborative resource to increase connectivity and accessibility to online information dedicated to promoting Canadian heritage institutions. The project involved more than a simple facelift. It was about interdisciplinary research to define the users' needs in order to transform the Guide into a significantly more functional, comprehensive, evolving and intuitive resource for the growing range of today's Web users. It was also about investigating the new opportunities offered by the WWW to increase the visibility of Canadian museums, galleries, zoos, forts and more; testing and creating contexts for partnerships; and about offering incentives to encourage collaboration. This paper will examine the ways in which the research on developing a collaborative service in a dynamic environment affected the vision and the application's architecture and interface.

The Vision

The redesign of the *Guide* is not the result of a single cause but is due to the convergence, integration and interdependence of many factors. We usually stress communication and technological progress as the impetus for change. But we must admit that it is impossible to dissociate these elements from others, such as ecological, economic and human factors. The new vision of the *Guide* is based on logic of association and complementarity, leading to the emergence of associative values that foster understanding, and respect for various ideas and cultures.

The new *Guide* is based on many principles, including participation, openness, decentralization of responsibilities, co-operation, sharing of interests and resources, and group ethics. The main challenge for the *Guide* is to achieve an organic synthesis, integrating diversity. This involves finding ways to reconcile a collective presence on the Web and individual identities, maintaining and enhancing the visibility of all participants while seizing the opportunity afforded by the growing complexity, evolution of knowledge and integration of knowledge from different heritage disciplines. The new *Guide* moves away from the central resource model that has been characterized by a coherent collection of information gathered from distributed resources, registered and accessible from one central point. It now adheres to a metacenter (*Meta*, a prefix meaning "changed in position", "beyond", "on a higher level", "transcending") model, i.e., a body of knowledge about bodies of knowledge or about fields of study.

The metacenter is not a centralized collection of information but a conceptual integration – by means of metadata – of the accessible or available information. It is the integrated state of rela-

tionships established among multiple and distributed information objects through metadata. A metacenter is intimately linked to a group of resources, in continuous communication.

By definition, the metacenter is responsible for two main components: integration and expression.

As a guide for travellers, in the real world and cyberspace, who are seeking information and experiences, the metacenter is designated to be an efficient monitor for quality, integrity, manageability, organization and interoperability. It provides a Web presence and increased visibility for all participants. It is a gateway to cross-disciplinary realms and networks.

The *Guide* acts as the floating centre of an evolving network of knowledge. It monitors the increasing complexity expressed by the growing number of connections, similarities and differences in heritage on-line resources. It provides an effective, efficient and enjoyable journey. In essence, 'Guiding' the world to Canada's museums through "The yellow brick road or the straight and narrow": as connected and networked as the "yellow brick road" or as "straight" and as "narrow" or as short and as direct the user chooses.

I. Architecture

Initially, the architecture of the *Guide* was viewed as a relatively static and isolated implementation. The architecture was developed as a repository of information created by a virtual community of heritage professionals who worked together to increase the profile of Canadian museums, nationally and internationally. The goal was to increase audience awareness of the Canadian cultural heritage through access to heritage information on the Internet.

The new version of the *Guide* – "The Great Canadian Guide" – reveals changes in the role of repositories. A repository of information is no longer considered an isolated container of information but an integrator of resources.

Integration produces changes in the architectural components: building blocks, behavior and context. The building blocks are no longer fixed. They are evolving, increasing in complexity. Behavior is based on openness, communication, collaboration and trust. The contexts are expanding and condensing spaces and times.

The new architectural attributes have produced significant changes in the role of participants. They are no longer viewed as simple contributors or recipients of information but as involved team players, building on information resources by adding to them or by creating new combinations of data.

The initial architecture of the *Guide* was developed to function in a known environment where interactions among the information objects and the environment were viewed as fully determined and controlled. The challenge for the new *Guide* has been to develop architecture for an environment that is growing and changing in a way that has never before been encountered.

> "The building metaphor has outlived its usefulness. It is time to change again. If as I believe, the conceptual structures we construct today are too complicated to beaccurately specified in advance, and too complex to be built faultlessly, then we must take a radically different approach ... Let us turn to nature and study complexity in living things ... The brain alone is intricate beyond mapping, powerful beyond imitation, rich in diversity, self-protecting,self-renewing. The secret is that it is grown, not built" (Brooks, 1995).

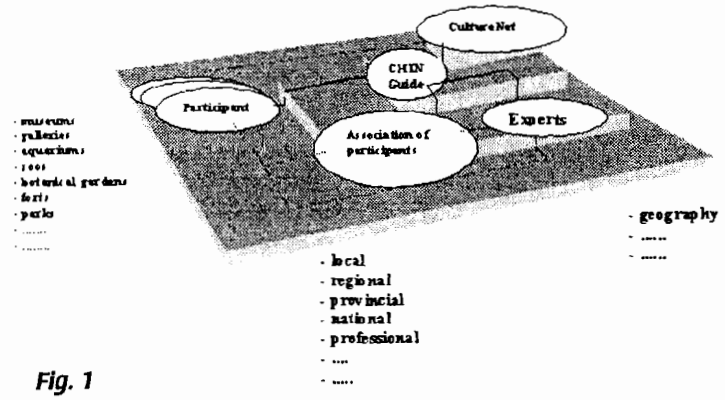


Fig. 1

The main idea behind the new *Guide's* architecture is to ensure significant Web presence and visibility for the participants. The research on architecture attributes in today's Web reality and construction facilities required the architectural design to focus on growth, integration, expression and communication. Growth and integration are based on: decentralized components; personalized spaces; adaptive generation of a keywords paradigm and structure; and evolving complexity. Expression and communication are based on: searches across multiple information resources with different perspectives; use of discovery/selection device; an active environment, recommendation of topics; and openness and visibility.

Growth and integration

I.1. Decentralized Components

Decentralization occurs vertically and horizontally. Vertical and horizontal decentralization can be expressed by the metaphors, Carl Lagoze cited in a recent *ABC's of Metadata Seminar* (Lagoze, 1999). The "Lego Model" could express the horizontal decentralization while the Ukrainian Doll Model could express the vertical one. For example, horizontally, the Guide connects the decentralized information collected by current or potential participants such as museums, galleries, zoos, etc. It links to information put together by various associations and groups of participants, ensuring incremental access to information, minimizing duplication of effort, redundancy and information overload. Vertically, decentralization occurs through the distribution of responsibilities for collecting and updating different levels of information by different sources. It also involves analysis and definition of rules for the creation/extraction of data about collections, about groups and individual objects.

The process of interconnecting different levels of metadata is defined by linking the *Guide's - About the Museum Collection* container to the description of individual objects in Artefacts Canada - a resource with over twenty million information items, collectively built by the Canadian museum community, over the past 25 years. Another example is the *Guide's* connection to CultureNet. CultureNet manages cultural events; CHIN's *Guide* collects information on museum events, various museum associations build their calendars of events and each museum publishes its own events. These resources differ in terms of their comprehensiveness and extensibility. The metacentre's role is to ensure communication among these resources and eliminate redundancy offering access to the right resource based on the user's point of view and information needs.

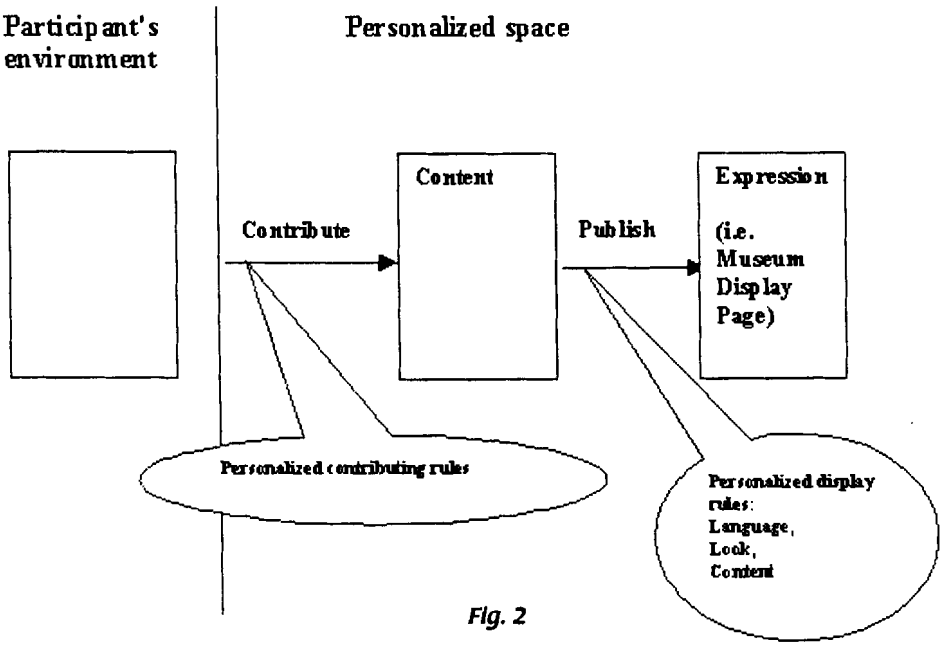


Fig. 2

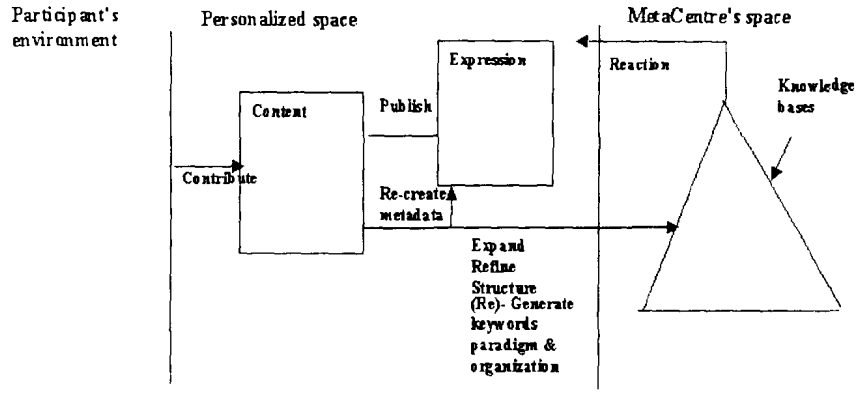


Fig 3

I.2. Personalized Space

Personalized space includes adaptive contribution and publishing methods. These methods enable participants to define the content, the language and the look according to their views or needs. Participants who have Web sites can contribute information on access points, thereby substantially increasing the visibility and the traffic to their site. Participants who have no on-line information gain Web-presence through contribution.

I.3. Adaptive Generation of Keywords Paradigm and Structure

Any action taken by the participant to contribute or update information starts a chain of methods: Contribute, Publish, (Re)Create Metadata, (Re)Generate keywords paradigm, Integrate. Identity and look issues are dealt by the Publish method, correct integration is ensured by the Expand, Refine and Structure functions and the organization of the keywords is adapted to the new situation.

I.4. Evolving Complexity

Distinction and connection determine the two dimensions characterizing complexity. Distinction corresponds to variety, to heterogeneity, to the fact that different participants behave differently. They may contribute in English and/or in French, contribute images or not, etc. Connection corresponds to rules, to the fact that different items of information are not independent, the fact that the knowledge of one part allows the determination of features of the other parts. Complexity increases during expansion and refinement. Expansion increases variety and distinction. Structure increases dependency and the number of connections. Expansion is differentiation, the expression of identities. Creation of structures may be viewed as integration (Heylighen, 1996).

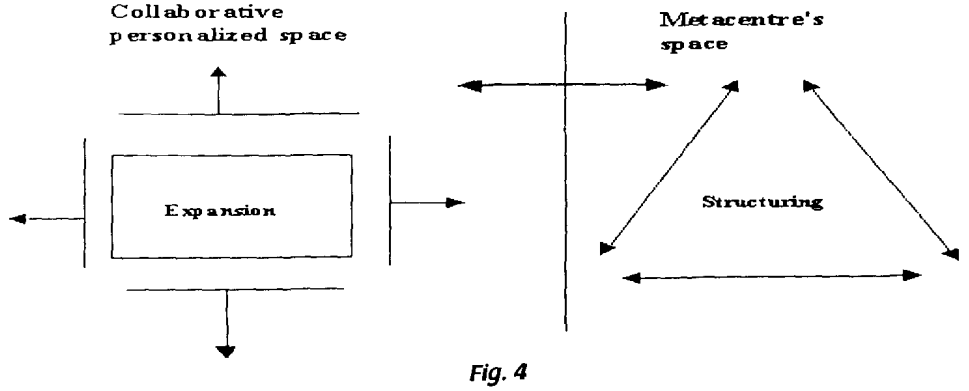


Fig. 4

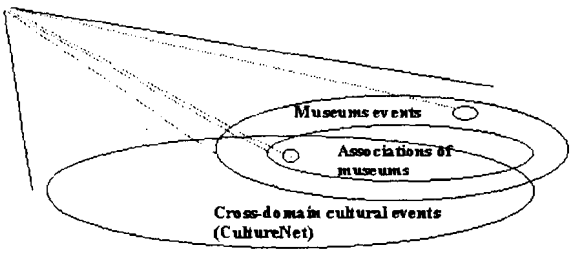


Fig. 5

Expression and Communication

I.5. Searches Across Multiple Information Resources with Different Perspectives

Perspective is adaptable. The users can focus their searches to the area and the level of granularity that they wish.

I.6. Use of Discovery/Selection Device

An adaptable discovery/selection device guides the searcher through the environment. The discovery/selection device is based on the what, where, when and who concepts. The device has to adapt to the space in which it is operational and to the specific needs of the user. It will be described below in more detail.

I.7. An Active Environment, Recommendation of Topics

The plan is to develop a mechanism to identify topics of the greatest interest to users. Presently the discovery/selection device offers access through topics grouped together under a heading in question form. The question is the connector between the user's goals and the discovery/selection device's knowledge. To begin with, only factual questions are considered. They are used to communicate to the searchers the basic facts in

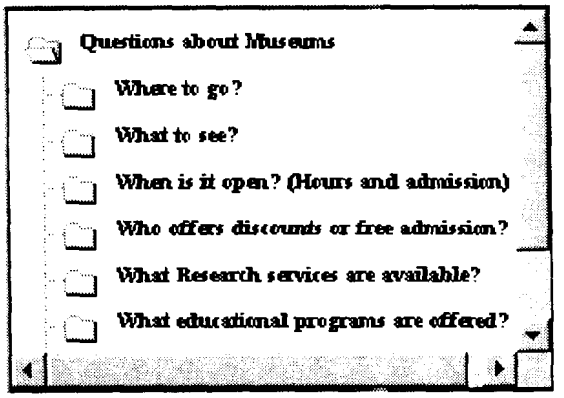


Fig. 6

order to enable them to carry out searches by concepts. They include what, where, when, who questions. For example: "Where to go?" Research is conducted on the possibility of adding, in the future, explicitly broadening questions ("What is the relationship between...").

I.8. Openness and Visibility

The architecture is open. It enables evolution: extension, refinement and communication. Through a metadata generation process the information about each museum can be retrieved directly by any search engine on the web. Information can be accessed through CHIN's specialized discovery/selection device - the Remote Control. Using the Remote Control enables grouping, refining and sorting of results. Heritage information is visible from different perspectives: all cultural events, museum events, only art exhibitions, highlighted events, nature trails, etc. The keyword paradigm and structured information can communicate with any standard access to distributed databases (such as Z39.50).

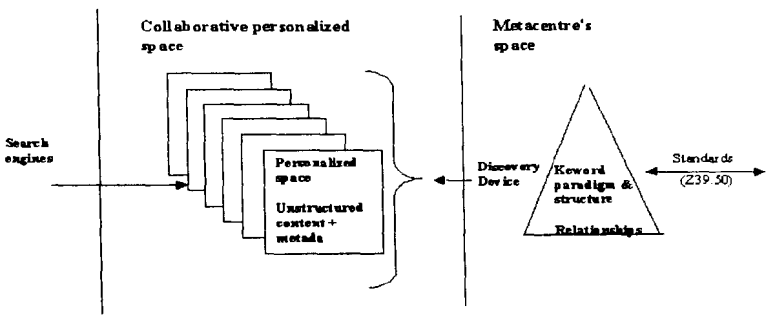


Fig 7

II. Interface

The interface goals cover cognitive and affective aspects. The interface design looks at ways to improve consistency, predictability, control, mastery and to increase satisfaction and responsibility.

The input devices and strategies concept provides a tool to monitor quality, integrity, manageability, organization and interoperability in a collaborative information space. Specific user-needs include: adaptability to individual expectations regarding content, language and look, full control by users regarding publishing, updating and withdrawing the information, reconciliation of identity and integration issues through creation of personalized spaces, adaptive generation of metadata and adaptive generation of keywords.

The concept for the output devices and formats provides a tool to ensure effective and enjoyable access to heritage information in a distributed environment and to increase the visibility of the participating institutions.

Specific user-needs include:

1. Quick access expressed by a reduced number of clicks
2. Adaptability to individual preferences expressed by various access scenarios and points of view
3. Process orientation expressed by the user's increasing involvement and responsibility in the discovery/selection usage
4. Discovery/selection viewed as experience
5. Smooth crossover through gateways
6. Interesting and challenging content

II.1. Quick access expressed by a reduced number of clicks

Separation of actions can reduce the number of clicks necessary to attain a goal. Actions can be grouped into two interacting spaces: the discovery/selection space and the acquisition of information or learning/enjoying space. Any action taken in the discovery/selection space can be reflected in the learning/enjoyment space. The discovery/selection space can function within, next to, in front of, or behind the learning/enjoyment space. It can be imagined as totally detached, functioning as a Remote Control device. This Remote Control is imagined as a specialized device incorporating knowledge answering to individual requests and adapting to the known environment. In the known environment, in the space dedicated to information on Canadian museums knowledge and the Remote Control can assist the interested public more efficiently than other general access tools. It can coexist and collaborate with commercial search engines that function on different levels.

The concept is a reflection of the research conducted by Alex Pentland, at the M.I.T Media laboratory: "Roughly it is making machines know who, what, where, when and why, so that the devices that are surrounding us can respond more appro-

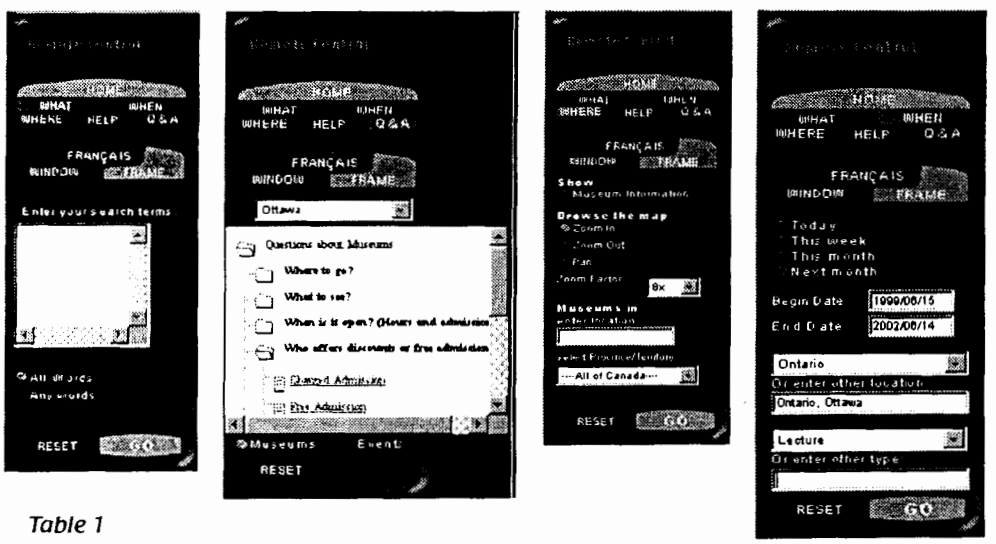
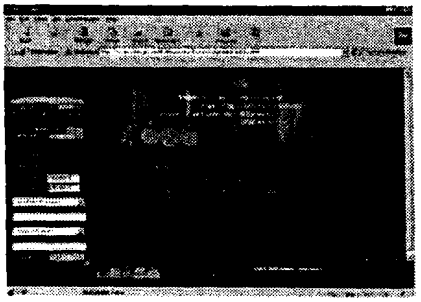
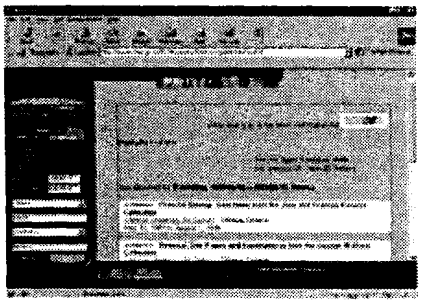


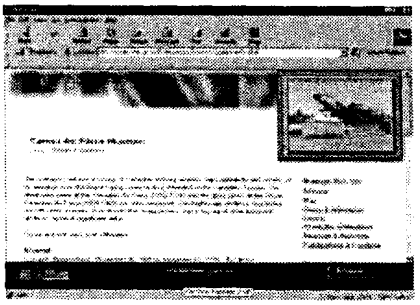
Table 1

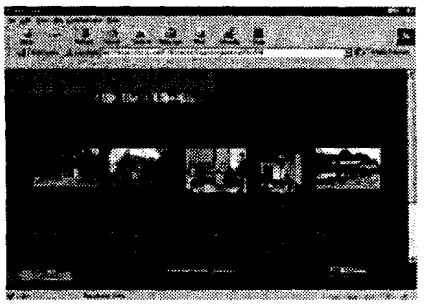
What **Where** **When**





Discovery/selection example





Learning/enjoyment example

Table 2

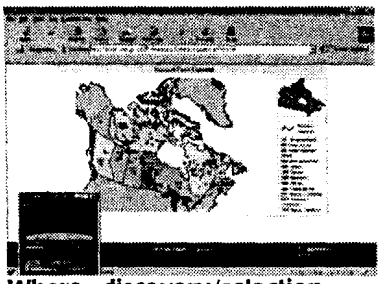
priately and helpfully" (Pentland, n.d.). It is a simplified and reduced design of this concept described above, implemented in the current Web, and having as target general users. The learning and enjoyment space emphasizes the interaction with content during the information acquisition, learning process or creation of new links. The "what", "where", "when" concepts for access points are questions, encouraging dialogue and not doubtful assertions. These concepts are cross-cultural and easy to translate.

II.2. Adaptability to individual preferences expressed by various access scenarios and points of view

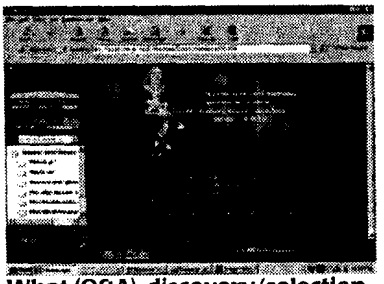
Each selection option is doubled by free text entry, conferring the choice between selection and expression or the combination of selection and expression of the search criteria. Adding/refining or deleting/ broadening search terms create new associations, new groups of objects. This demonstrates progress and is a way to enhance creativity. The more flexible the discovery/selection device, the more unexpected grouping or organization of information can be attained.

II.3. Process orientation expressed by the user's increasing involvement and responsibility in the discovery/selection usage

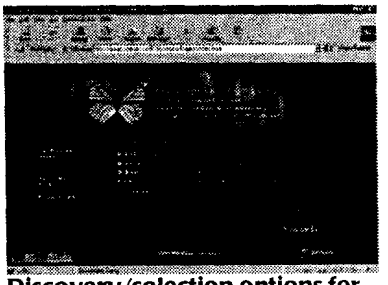
One of the aspects that has become increasingly obvious in the usage of the WWW is a shift in emphasis from the objects to the processes. The objects are the static description of items in data-



Where - discovery/selection device, in a window



What (Q&A)-discovery/selection device framed



Discovery/selection options for first-comers, frequent users can activate discovery/selection device

Table 3

bases. Processes are the actions to discover, select and learn about a set of items grouped together, dynamically, by goals stated by the user, for example, planning a visit to a museum or doing a school project. Processes can be driven by the user or by the system. Processes can lead to new organizations of information, for example new stories or histories or new items. Processes enhance creativity.

> "The burden of making relationships among the parts of the work has been shifted from author to viewer... In my work there is always a fixed database of material to be traversed in various ways determinable by the viewer and this results in a temporally non-linear representation playing against the linear time of the viewer's experience. Digitization allows the formation of new materials by the user. It is a very different concept of interactivity - it gives the user tools or an environment in which to work, an environment that generates materials according to rules described in advance by the maker. Now we are not exploring an already existent data-space ... no, here we are in a world in which the user, in collaboration with the maker, creates something which the maker may have not predicted" (Weinbren, 1997).

The medium, now, is not only the message but also the tool to create new messages!

Focus groups and tests have demonstrated that users react to the freedom offered by the discovery/selection tool in two almost complementary ways. Some enjoy the dialogue during the discover/selection phase and the potential for serendipitous discovery, they like the provocative aspect of the discovery tool. Some of the users prefer to go directly to and navigate through content.

II.4. Discovery/selection viewed as experience

Experience refers to information obtained externally by means of the senses and internally through emotion. Experience is not a single impression at a moment in time. It involves a series of information acquisition/learning events from the past which are actually in memory and are included in the present situation. The searcher is engaged in the process of forming and posing questions so that his or her creative skills and current understanding are challenged. Discovery/selection tools can assist in constructing complex searches or provide the opportunity for dialogue while respecting the point of view of the searcher and presenting the results within the desired context and interest level.

II.5. Smooth crossover through gateways

One of the roles of the metacenter is to provide orientation tools as the user navigates through multiple resources: concept maps, spatial maps or timelines. Smooth passage through the gateway is ensured in the *Guide* by keeping in parallel, for a while, both ends of the gate open and visible, launching two browsers in parallel.

II.6. Interesting and challenging content

A Web product, no matter how sophisticated, no matter how technologically cutting-edge, no matter how beautifully designed, and no matter how architecturally complex, is nothing without substance. Without a high level of interesting and stimulating content the structure is just a shell, soon to be forgotten as other more exciting and dynamic Internet sites take its place.

The content for *The Great Canadian Guide* has at its core, fundamental museum information, i.e., name and address, hours of operation and admission, description of the collection(s), and services offered. In partnership with the Canadian Museums Association (CMA), the new Guide will offer this type of information for more than 2400 museums, galleries, zoos and more, all across Canada. This degree of comprehensiveness is unsurpassed in today's World Wide Web. Add to this the ability to map all 2400+ institutions and to customize down to street level and a truly superior product has been created. A partnership with the federal government department, Statistics Canada, has allowed this functionality to be added to the *Guide*.

In addition to fundamental museum information, many entries show images and events information. These represent CHIN member institutions – currently numbering over 500. CHIN members are given an institution-unique Guide ID and password that is used by a designated person within the institution to enter detailed museum information, using easy-to-use, on-line input forms. This information includes not only all basic museum information such as name and address, hours of operation, institution and collection descriptions, and services offered, but also product highlights, links to specific URLs within the institution's own Web site, external links to local tourism, and coupons. CHIN members can also enhance their information with the inclusion of images and events infor-

mation. Audiences searching for these museum-related events will also have the ability to retrieve other cultural events (e.g. concerts, theatrical performances, dance) in a selected city or province via a link to CultureNet. A resource drawing on this many partners is also highly variable in respect of quality or level of interesting material, creating a real challenge to the metacenter to enable enrichment and evolution over time.

Separately, all of the partners in *The Great Canadian Guide* can provide useful information to the surfing public, but, together they provide information that is not only useful, but truly paints the bigger picture of Canada's diverse, yet unique heritage!

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