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**Designing of cultural knowledge portal:
a South Asian experiment**

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INTRODUCTION:

The south Asian region has a long history. Ancient civilizations developed in the Indus River Valley. The peoples of the region possess several distinguishing features that set them apart anthropologically from the rest of Asia and the world, the dominant peoples and cultures are Indo-Aryan and Dravidian, and have a great affinity with the peoples of Iranian Plateau and the Caucasus particularly in the north west region of South Asia encompassing the modern states of Pakistan and Afghanistan. Persian, Arab and Turkish cultural traditions from the west also form an integral part of Islamic South Asian culture, but have been adapted to form a Muslim culture distinct from what is found in the Middle East. The region was far more prosperous before the 18th century. Subsequently, European encroachments, initially by Portugal and the Netherlands, and later by France and British colonialism, led to political destabilization of the region, leading finally to almost complete occupation and rule by the British. Most of the region gained independence from Europe by the late 1940s, when these colonial powers were weakened by the World War II and could neither control the people of the region nor satisfy their aspirations.

Since 1947, most of the countries of South Asia have achieved tremendous progress in all spheres. Most notable achievements are in the fields of education; industry; health care; information technology and services based on its applications; research in the fields of cutting edge sciences and technologies; defence related self-reliance projects; international/global trade and business enterprises and outsourcing of human resources. In all these areas, Republic of India is leading the south Asian nations.

South Asia, which consists of the nations of India, Pakistan, Afghanistan, Bangladesh, Myanmar, Nepal, Sri Lanka, Bhutan, and the Maldives, is ethnically diverse, with more than

2,000 ethnic entities with populations ranging from the hundreds of millions to small tribal groups. The amalgamation of Dravidian, Indo-Aryan and local tribal cultures over the centuries created common culture, traditions and beliefs. The Vedic Sanskrit language and Vedic religion combined Indo-Aryan, Dravidian and local tribal beliefs to give rise to the Indian religions, including Hinduism, Buddhism, Jainism and Sikhism. As a consequence, they share many similar cultural practices, festivals, and traditions. The largest spoken language in this region is Hindi, numbering almost 300 million.

In south Asia majority of population belongs to Hindu, Muslim, Buddhist, Christian, Sikh and Jain religion. While analyzing the percentage wise distribution of the followers of different religions in South Asian countries, it is as follows. In Afghanistan Muslim (99%), In Bangladesh Muslim (82.8%), Hindu (14.2%), Buddhist (1.6%), Christian (1.3%), in Bhutan Buddhist (75%), Hindu (25%), in India Hindu (80.5%), Muslim (13.4%), Christian (2.3%), Sikh (1.9%), Buddhist (0.8%), Jain (0.4%), in Maldives Muslim (almost 99%), in Nepal Hindu (80.6%), Buddhist (10.7%), Muslim (4.2%), Kirat (3.6%), in Pakistan Muslim (96.28%), Christian (1.59%), Hindu (0.25%) and in Sri Lanka Buddhist (70.42%), Hindu (10.89%), Muslim (8.78%), Christian (9%). The enticing unity represented by the people of India who display a wide range of religions, culture, customs and languages. The rich and varied heritage happens to be one of the many sources of pride of the nation.

The culture of India has been shaped by the long history of India, its unique geography and the absorption of customs, traditions and ideas from both immigrants and invaders, while preserving its ancient heritage from the Indus Valley Civilization. India's great diversity of cultural practices, languages, customs, and traditions are examples of this unique co-mingling over the past five millennia. India is also the birth place of several religious systems such as Hinduism, Jainism, Buddhism, and Sikhism, which have had a great influence not only over India but also over the rest of the world. Various religions and the multi-hued traditions of India that was created with those amalgamations have influenced South East Asia and other different parts of the world. The great number of languages in India has historically created diverse cultures and traditions at both regional and national levels.

Hinduism is the oldest and most popular religion in South Asia today. The most ancient scriptures of Hinduism are the Vedas, which explain the ideas and mythologies of the Aryan people, who migrated into India from the North around 1500 B.C.. The four Vedas are the Rig Veda, the Yajur Veda, the Sama Veda, and the Atharva Veda. Each Veda consists of multiple parts, including the Samhitas, the Brahmanas, the Aranyakas, and the Upanisads, the famous philosophical portions of the Vedas. The religious texts of Hinduism can be divided into two classes, Sruti and Smriti. Sruti texts are those that are supposedly of divine origin, revealed directly to people from God. The Vedas comprise the Sruti texts. Smriti texts, on the other hand, are secondary scriptures, serving as commentary and elaboration on Sruti texts. The Smriti texts of Hinduism include the Smritis, the Itihasas (like Ramayana and Mahabharata, which contains the well-known Bhagavad-Gita), the Puranas, the Agamas, and the Darsanas. Similarly a number of religious scriptures of various religions of south Asian origin forms the back bone of the culture of respective group/society and gives a chance to learn about the respective culture, society.

The specialty of the culture and cultural resources of various south Asian countries varies as per their religious belief, language, climatic conditions, economy and the effect of external groups and societies. It is identified that we should examine a number of elements of the concern society for understanding their culture. These elements are religion, language, literature, sculpture, architecture, food, festivals, music, drama etc. As I have stated earlier that most of these countries have achieved enormous growth and development after first half of 19th century. Some of the south Asian countries are lagging behind; it is due to various reasons as low quality of research, limited economic and natural resources etc. For achieving fascinating growth in all walks of life of all south Asian countries, it is essential to explore rich treasure of past through manuscripts, religious scriptures, beliefs, traditions etc. and to utilize all of it for achieving better research results. In other words we must know and experience our glittering past and should try to conduct research while utilizing it.

Being information professional, we can reassemble this rich treasure and provide all those services which promote its usage for producing quality research in different areas of life. After an extensive study, it is identified that for promoting the usage of cultural resources, we should deliver desired information based service at the desk of user. And also we will have to take care of the environment though which we are going to cater the cultural resources. We should take care of the nature, complexities, limitations and specialties of the information/information sources/cultural elements. Finally it is identified that digital storage and delivery of these information elements will best suited for the dissemination of culture based information to all identifiable/unidentifiable user group of the region. For the above mentioned requirements, it is identifies that a portal might be a best suitable tool for catering culture based information to a large number of users.

WEB PORTAL TO CULTURAL KNOWLEDGE PORTAL:

For understanding the concept and its present status, various abstracting tools have been searched. There after relevant full text documents have been checked to know about the complete view of the author. Various scholars have described the concept of portal in different ways. They have presented varied nomenclature as per the features and the services, as: **Boss (2006)** defines a portal as “a single user interface for access to a wide variety of electronic resources both within and outside the library.” **Zhou (2003)** traces the history of web portals, which originated in the business sector in the early 1990s. **Savarese (2005)** describes the various stages of development from the card catalog to the library portal and how the mission of the library and the purpose of the catalog changed along with it. **Morgan (2000)** presented his view of “user-customizable library portals”. **Cox (2003)** lists various functions of the portal. **Thomas (2000)** stresses that instead of striving for comprehensiveness, the goal of the catalog as portal must be to increase the ability of a community of users to meet their information needs by doing as much “one-stop shopping” as possible. **Mckeen and Parent (2000)** claim that catalog users of the new millennium wish “to have (in the catalog record) a convenience of finding not only reference to an item or article but almost instant access to the item itself.” **Ramsden (2003)** provides a good review of several of the known products. **Cox and Yeates (2003)** review library portal solutions provided by library management system suppliers. **Sadeh and Walker (2003)** reviews individual products, such as MetaLib. **Myhill (2005)** reviews Ex Libris by and Millennium Access Plus (MAP) from Innovative Interfaces Inc. **Carden (2004)** clarifies the distinction between library portals and enterprise portals. **Deltor et al. (2003)** find variations in the literature on the agreement over what constitutes a library portal.

The web portal, considered as an earlier stage of a portal, was first adopted by libraries in 1998 when mylibrary portal was introduced at the North Carolina State University Libraries (**Morgan and Reade, 2000**). Since, then the library portal has been considered as a super discovery tool that accumulates high-quality content and thus it was designated as the dream portal (**Jackson 2002**). It has been found as a fast and powerful, searches across formats and resources and returns results that are deduped and relevancy ranked, delivers full text or information objects whenever available, integrates appropriate applications, and supports authentication and permits customization and personalization.

The European Library Automation Group (ELAG) defined a library portal as an application which allows one-stop-shop access/searching and discovery via a unified single-point interface to organised heterogeneous resources and enabling services to a pre-defined community (**European Library Automation Group, 2002**). The portal is the interface, the place where information exchange and knowledge transfer takes place, but it is only one component of successful KM (**Cloete and Snyman, 2003**). The most important functions of a library portal are typically resource discovery, federated metadata-based searching, and direct access to content (**Davies, 2006**). It can enhance resource discovery through eliminating the confusion in the name of databases and their contents by giving more detailed explanations of what type of material resources contained, knowing how to get to full text; and maximizing use of print holdings (**Groenewegen and Huggard, 2003**). Portal can bring too much information to the users (**Boss 2002**), though he suggests that solutions to that problem are relevancy ranking, filtering for relevancy and ranking the search results according to predetermined criteria. Such portals are becoming invaluable in supporting learning and teaching in the traditional and the online environment.

Various services or applications which can be performed through portals as one can submitting online reference questions; submitting ILL requests; can request retrieval of local material to be held for users at a library service point; can access remote, fee-based services; request retrieval of local material to be delivered to users; can request photocopies to be made and delivered to users, via the web; may be useful in accessing e-mail; can provide access of institutional services; and access of full-text journals and e-books (**Wetzel and Jackson, 2002**).

In addition to accessing the online catalogue and subscription databases, users at workstations should have access to such software clients as e-mail, word processing, PowerPoint, and provide easy access to course information and class syllabi (**Gerrity et al., 2002**). Library portals are a subset of Web portals and serve library based specific academic research communities. Libraries – digital libraries in particular – are important memory organizations that form a keystone for the development of the semantic Web (**Miller, 2001**). The integrated, cross-database searching through a wide range of resources will be the core feature of library portals as they become more entrenched (**Jackson, 2002**). A portal should include elements of value adding, customization and personalization functions (**Van Brakel 2003**), and further he suggests that two broad categories of portals as horizontal or public portals and vertical (corporate or enterprise) portals. Classification of various types of portals is primarily based on the environment within which a portal operates is an effective point for classification process. Dias distinguishes Public environment and Corporate (and academic) environment (**Dias, 2001**). Strauss also divides environments into two basic groups as Horizontal enterprise portals and Vertical enterprise portals (**Strauss, 2002**) and Looney and

Lyman use another set of terms to depict different categories of portals namely Consumer portals and Community portals (**Looney and Lyman, 2000**).

Dias provides an excellent list and interpretation of definitions from a number of authors, showing the diversity of opinion between the years 1999 and 2000. Based on these, Dias consequently identified various categories of portals, suggesting through this process that decision support and management information systems were the precursor of portals (**Dias, 2001**).

In any organization (research or institution), user requires internal and external information sources, and portal based services reduces costs and also it seems to be good information delivery point, but this does not make a portal unique when compared with the functionality of a good intranet directory or a hub of links to digital information resources. It is surprising how many times the term portal is being used to describe a static Web site environment (**Brakel, 2003**). In this regard a comment from the **Meta Group (2002)** is worth mentioning, namely that (enterprise) portals are replacing first-generation intranet Web sites as a more effective, efficient and flexible means of managing and delivering applications and information to diverse sets of users. Connolly identifies three generations of Web environments as Internet Web site, Intranet Web, and on the other hand a portal, a gateway to the Web that allows the plethora of information on Internet and intranet Web sites to be organised and customised through a single entry point (**Connolly, 2000**). Later on Jafari confirms the Connolly's approach **Jafari (2003)**.

Katz and Goldstein are of the same opinion, specifying that portals constitute a critical layer of middleware that enable users to customize, personalize and tailor resources and services according to their unique needs and preferences (**Katz and Goldstein, 2002**). Portals offer active and dynamic services as compared to the mostly passive services provided by traditional Web sites (**Jafari, 2003**). **Fleischman's (2001)** lists following elements are essential for a campus portal: Single access point, Internet tools, Collaboration tools, User customization, Channel information, Pushed information. According to Brakel out of Fleischman's list last three elements are essential building blocks of any portal (**Brakel, 2003**). Fleischman have not included the personalization as essential element. In the context of information portal Brakel added one more element as personalization and thus suggested four building blocks (channeled information, pushed information, customization and personalization) of information dissemination (**Brakel,2003**).

(**Dias, 2001**) has grouped vertical portals into three broad areas, each one further subdivided according to their more specific functions:

- Portals with emphasis on decision support: Information or Content Portals, Business Portals, and Decision Processing Portals
- Portals with emphasis on collaborative processing: Collaborative Portals, and Expertise Portals.
- Decision support and collaborative processing portals (a combination): Knowledge Management Portals, and Enterprise Information Portals.

In view of the arguments discussed so far, it could be categorically stated that Dias' description of the nature of an information or content portal does not effectively describe what an information portal should be able to accomplish, that is, support or contain one or more of the essential information-based building blocks: pushed information, channel information, customization and personalization.

JISC defines a portal as being, technically, a network service that brings together content from diverse distributed resources using technologies such as cross-searching, harvesting, and alerting, and collates this into an amalgamated form for presentation to the user (**Powell, 2003**). This presentation is usually via a Web browser, though other means may also be possible. For users, a portal is defined as an often personalized, common point of access where searching can be carried out across one or more than one resource and the amalgamated results viewed. Information may also be presented via other means through a portal.

All portals being developed within the JISC IE need to conform with a Base-line Portal Specification (**UKOLN, 2003**) that will provide the necessary functionality to allow interoperability and access across different content providers. However Awre has broadly categorized various types of portal (**Awre, 2003**) as: Subject Portals, Data Format Portals, User community Portals and Institutional portals.

Several portals focus on a specific application or area, realizing that they do not have the resources or desire to cover all portal areas. The major types of portals include horizontal, vertical and corporate (**Issacs, 1999**):

As several authors have presented varied views for defining and representing the concept of portal, none of them has explained its culture based applications and to utilize it as a tool for developing a collaborative environment for catering knowledge to wide range of societies. **Cultural Knowledge Portal** can become an excellent medium for bridging the gap between rich cultural heritage and research community. It will provide information on various cultural aspects like religion, literature, language, traditions, music, drama, architecture, sculpture, painting, sports and many others. It will connect the rich past of any community to the present and will assist in building prosperous future.

DESIGNING CULTURAL KNOWLEDGE PORTAL:

Portal is the most powerful tool for the delivery of customized data to the end-user. Information professionals are now empowered to deliver information to the right person at the right time, and, more importantly, create a virtual environment where individuals can collaborate, communicate, conduct research, and plan activities based on a common interest.

Portal development is a complex and costly endeavor that requires meticulous planning and design. It must consolidate and prioritize all the requirements representing the culture. The decision to develop a cultural knowledge portal is based on the desire to expand the scope and capabilities of various cultural resources as well as to provide a user friendly environment for exploring diversified cultural information of a number of societies, communities and countries. The primary objective in creating a cultural knowledge portal is

to provide a seamless view of different cultures collectively, which logically presents information by interest groups with enhanced delivery. The cultural knowledge portal would provide the ability to connect end-users to a single gateway of customized, personalized, consolidated, integrated, and enhanced information. It would also provide the ability to incorporate external data from outside of the knowledge management system to provide for the most comprehensive access possible to needed information. This new knowledge management based environment will also provide the opportunity to add new resources representing different society. It will provide various sources of information which might be of importance for tourists, academicians, administrators, planners and researchers that currently are not published on any of the official or popular web site. It is true that various content providers publish and disseminate such information on a daily basis but they do not collectively provide comprehensive information over a common platform for the purpose of education, research, policy making and societal development.

For its success, it must have a comprehensive knowledge management system as its foundation. The cultural knowledge portal is the tool that links the various silos of knowledge management (internally and externally), in a meaningful way, into one unified source to facilitate policy making and decision making.

For developing a cultural knowledge portal we will have to proceed in a systematic manner. In other words we will have to start right from the portal document and end on the implementation of the portal. A portal-definition document is the blueprint that outlines the overall portal structure; consolidate and prioritize all the requirements and includes the following components:

- Draft of theoretical layout;
- Content Creation and Content Management strategy;
- Managerial aspects; and

The document must of the portal. The draft must answer the issues related to the objectives, prospective users, variety of content and the usage pattern. The document should also outline the benefits and return against the endeavor. It will help the developers to focus on the major objectives and to facilitate critical decision making during the definition and development processes. It should accumulate various elements as **(Augustyniak, 2005)**: mission statement; objectives; needs; assessment; creative layout; benefits; and funding.

The mission statement is a general statement of purpose and scope and should address about the prospective users, proposed information sources/services and issues related to delivery etc.

The Cultural Knowledge Portal will transform the way end-users access valuable information about different south Asian countries. For example, from any Internet-connected device, Visitors (or guest users) will have access to general knowledge based information on different south Asian countries at the same time registered users will be able to access information about various digital resources like manuscripts in full or abstract form. Besides

a portal may provide access to tools such as calendars, links, publications, federated search engines, etc., that allow users to create and organize the information.

The cultural knowledge portal will enable two way information deliveries to all of the universities research centers and sponsored research of the region to populate itself with relevant data in real time. This symbiotic relationship will help all groups accomplish the goal of promoting research by creating a unified foundation for distributing information to thousands of potential users throughout the world (**Augustyniak, 2005**).

Although there are many possible objectives for cultural knowledge portal, it is important that they support user as well as community goals. While setting objectives, it must be remembered that an integrated work space is far more valuable than simply aggregating content.

The objectives for the Cultural Knowledge Portal are as follows:

- promote and publicize cultural resources of the region;
- promote research activities and opportunities;
- collect and aggregate resources;
- provide value-added information;
- implement a robust and effective content-management strategy;
- deliver relevant and up-to-date information through user-defined filters;
- provide easy, reliable access to a variety of disparate information services;
- create opportunities for collaboration;
- facilitate community building based on cultural and research interests; and
- provide an environment where users can create, store, and share information.

While designing a cultural knowledge portal, it is essential to determine the needs of the target users. The tools for determining user needs are the same ones used for conducting a needs assessment for any user-centered product, such as surveys, interviews, and questionnaires. Understanding the needs of the end-users is paramount to the success of the said portal. All web-based applications are dynamic and require continuous evaluation and enhancement. Integrating quick and easy feedback mechanisms within the portal provides real-time assessment in order to monitor trends, activities, and functionality requirements.

A creative layout is a powerful and essential tool for helping developers to conceptualize the end product and its purpose. The creative layout is often helpful in identifying useful information that was not identified in the needs-assessment process. It is not a fully functional prototype. A full prototype should be created before cultural knowledge portal start functioning in order to avoid confusion and disappointment in the design and functionality of the end product. The final layout may be achieved after several continuous changes, modification in design and implantations against user survey and feedbacks. Outlining the benefits is an important strategy in promoting and gaining acceptance of any new idea or product.

Fiscal support is a critical and most important issue for the success of any project. For taking up such an ambitious project, national and international agencies should come forward. Government of various participating countries, cultural organizations, NGOs and other international agencies working for the development of societies and culture like UNESCO, International Development and Research Centre (IDRC) etc can play a major role in mobilizing fiscal requirements.

The successful retrieval of relevant content through the portal is the result of the Content Management strategy. Here we will discuss content inventory, content Analysis, Content Acquisition, Access Structure, Metadata Standard and Classification based issues. Identifying content-related issues in detail is the most labor intensive and critical step in defining such strategy for the portal.

The purpose of a content inventory is to determine various issues related to data, its storage and the content value. A content inventory will help identify gaps and shape the content plan as well as pinpoint duplicative data and data that are no longer of value. Basically there are three basic steps in the content inventory process these steps are Survey for high level review of content/sources (**Fraser, 2001**). While performing the content inventory process, it is essential to determine the type of information for collection, creating data fields; and developing a database.

After completing the inventory process, the analysis process starts. Analysis helps in establishing content patterns and relationships. It also assists in identifying and understanding various types of content that need to be reconciled in the content management strategy.

On the basis of the content inventory and analysis, a content acquisition strategy can be developed. Content acquisition is the process of gathering information for the CM system. The format of the content will affect the acquisition strategy as well. The content may be provided in a readily usable form (electronic file, metadata); otherwise the content may require extensive processing and restructuring. Participating countries will have to provide the core content for cultural knowledge portal. This content will be high-quality, structured data.

Access structures are the means of organizing content in order to find it easily and reliably (**Boiko, 2002**). Access structures need to be considered from both the perspective of the end-user as well as that of the portal management. A cultural knowledge portal requires multiple access structures, depending on tasks and users. Some examples of access structures are confined to the regional communities in terms of languages, architecture, sculpture,

religion, painting, music, drama, literature, manuscripts and sports etc. In terms of literature, manuscripts and other items of literary value the access structure are tables of content, keyword indexes, subject descriptors, and hyperlinks. Boiko identifies four types of access structures: hierarchies, indexes, cross-references, and sequences. He further describes as a hierarchy is a “system of phrases that classifies and sub-classifies information” (**Boiko, 2002**).

One of the purposes of a portal is to provide one-stop access by seamlessly integrating content from disparate and external systems. In order to do this, there needs to be a common language and rules. In the world of portals, extensible markup language is the language standard and Dublin Core is the standard set of rules.

“Classification (taxonomy, categorization) is to content as mapping is to geography” (**McGovern, 2001**). Classification is an essential tool for quick and efficient navigation and search. One of the largest hurdles in developing an effective cultural knowledge portal that provides customized data delivery is an effective classification strategy. Successful development of a CKP requires the marriage of information management and information technology.

For the purpose of cultural knowledge portal taxonomy of broader categories (for areas like literature, religion language, sculpture etc.) is required to design. Besides this separate taxonomies may be developed for each category. It may be a simple list of hierarchical items. Finally the cultural knowledge portal needs a unified taxonomy with multiple tiers as the actual replacement.

For developing the content creation and content management strategy for the cultural knowledge portal, we will have to consider the specific issues as to customized content filtering based expanded searching; storage and searching facility of varied categories of cultural importance. This may include a number of formats for data storage and also serve various facilities for protecting cultural interests through news, awards, events, e-forums, blogs, chats, and links; develop several categories of users depending on their registration as guest, citizen, research scholar, institutional users, free liance cultural social group or any other, and to create information search facility having sophisticated content filtering as provided to the specific category;

In the universe of portal planning, a comprehensive framework must be provided with coherent approach for organizing the strategic and operational components for the implementation and ongoing management of portal services and applications. The portal administrative framework acts as the plan for mission command and control.

Portal governance “is all about an enduring set of rules and practices; roles and organizations to support them.” (**IBM Business Consulting Services, 2004**). Portal governance deals with establishing and administering the processes and systems necessary to ensure the ongoing viability of the portal. The governance model represents the strategic arm of the administrative framework. It encompasses the decision-making units that provide direction, accountability and leadership. It may include advisory council, steering committees, participating organizations, sponsoring bodies, chief executive and other key executive staff. These governing units are responsible for establishing and maintaining goals,

objectives, roles, policies and procedures necessary for the ongoing maintenance and operation of the cultural knowledge portal.

Technological advancements have changed the overall library scenario; presently we have adopted all of these developments and changed the library practice for best user services. We are not leaving any stone unturned in exploring best information for fulfilling the research based requirements. This contribution performs well in producing quality research and finally it can be observed in the form of societal development. Cultural Knowledge Portal is a relatively new concept, as I have discussed it may become a valuable tool for producing better research results while utilizing a huge amount of unexplored knowledge of the past.

REFERENCES:

Boss, R.W. (2006), "Library portals", available at: www.ala.org/ala/pla/plapubs/technotes/librarywebportals.htm (accessed May 2, 2008).

Zhou, J. (2003), "A history of web portals and their development in libraries", *Information Technology and Libraries*, Vol. 22 No.3, pp.119-28.

Savarese, J. (2005), "Library portals and what's next campus technology", available at: www.campus-technology.com/article.asp?id=11087 (accessed May 1, 2008),

Morgan, K., Reade, T. (2000), "Pioneering portals: MyLibrary@NCState", *Information Technology and Libraries*, Vol. 19 No.4, pp.191-8.

Cox, A., Yeates, R. (2003), "Library portal solutions", *Aslib Proceedings*, Vol. 55 No.3, pp.155-65.

Thomas, S.E. (2000), "The catalog as portal to the internet", available at: www.loc.gov/catdir/bibcontrol/thomas_paper.html (accessed May 2, 2008),

Mckeen, L., Parent, I. (2000), "The national library of canada: organizing information for the new millennium", *Cataloging & Classification Quarterly*, Vol. 30 No.1, pp.33.

Ramsden, A. (2003), "The library portal marketplace", *Vine*, Vol. 33 No.1, pp.17-24.

Cox, A., Yeates, R. (2003), "Library portal solutions", *Aslib Proceedings*, Vol. 55 No.3, pp.155-65.

Sadeh, T., Walker, J. (2003), "Library portals: toward the semantic web", *New Library World*, Vol. 104 No.1184/1185, pp.11-19.

Myhill, M. (2005), "A MAP for the library portal: through the library labyrinth of online information sources", *Online Information Review*, Vol. 29 No.1, pp.5-17.

Jackson, M.E. (2002), "The advent of portals", *Library Journal*, Vol. 127 No.15, pp.36-9.

- Carden, M. (2004), "Library information within the enterprise portal", available at: www.elag2004.no/papers/Carden.pdf (accessed May 1, 2008), .
- Deltor, B., Ruhi, U., Polland, C., Hanna, D., Cocosila, M., Zheng, W., Fu, E., Jiang, T., Syros, D. (2003), "Fostering robust library portals: an assessment of the McMaster University library gateway", available at: www.business.mcmaster.ca/msis/profs/detlorb/Working_Paper_4.pdf .
- Morgan, K., Reade, T. (2000), "Pioneering portals: MyLibrary@NCState", *Information Technology and Libraries*, Vol. 19 No.4, pp.191-8.
- Jackson, M.E. (2002), "The advent of portals", *Library Journal*, Vol. 127 No.15, pp.36-9.
- European Library Automation Group (2002), "Report of the Portal Workshop of the European Library Automation Group Meeting, Rome, Italy, 17-19 April 2002", available at: www.ifnet.it/elag2002/workshop.html.
- Davies, R. (2006), "Library portals", in Cox, A. (Eds), *Portals: People, Technology, Processes*, Facet, London, .
- Groenewegen, D., Huggard, S. (2003), "The answer to all our problems? Trialling a library portal", *Library Review*, Vol. 52 No.9, pp.452-9.
- Boss, R.W. (2002), "Library web portals", available at: www.ala.org/ala/pla/plapubs/technotes/librarywebportals.htm, (accessed May 3, 2008).
- Wetzel, K.A., Jackson, M.E. (2002), "Portal functionality provided by ARL Libraries: results of an ARL survey", available at: www.arl.org/newsltr/222/portalsurvey.html, (accessed May 3, 2008).
- Gerrity, B., Lyman, T., Tallent, E. (2002), "Blurring services and resources: Boston College's implementation of MetaLib and SFX", *Reference Services Review*, Vol. 30 No.3, pp.229-41.
- Miller, E. (2001), "Digital Libraries and the semantic Web", presentation by Eric Miller, at European Conf. on Research & Advanced Technology for Digital Libraries, Sept. 4-9, Darmstadt, Germany, .
- Jackson, M. (2002), "The advent of portals", *Library Journal*, libraryjournal.reviewsnews.com/index.asp?layout=articleArchive&articleid=CA242296,
- Van Brakel, P. (2003), "Information portals: a strategy for importing external content", *Electronic Library*, Vol. 21 No.6, pp.591-600.
- Dias, C. (2001), "Corporate portals: a literature review of a new concept in information management", *International Journal of Information Management*, Vol. 21 No.4, pp.269-87.
- Strauss, H. (2002), "All about Web portals: a home page doth not a portal make", in Katz, R.N. (Eds), *Web Portals and Higher Education: Technologies to Make IT Personal*, Jossey-Bass, San Francisco, CA, pp.33-40.
- Looney, M., Lyman, P. (2000), "Portals in higher education", *Educause review*, available at: www.educause.edu/pub/er/erm00/articles004/looney.pdf, pp.28-36.

- Meta Group (2002), "Portal market evaluation will force framework decisions", available at: www.metagroup.com/cgi-bin/inetcgi/jsp/displayArticle.do?oid=28664
- Connolly, C.G. (2000), "From static Web site to portal", *Educause Quarterly*, available at: www.educause.edu/ir/library/pdf/eq/a002/eqm0024.pdf, (accessed May 3, 2008), No.2, pp.38-43.
- Jafari, A. (2003), "Designing campus portals", in Jafari, A., Sheehan, M. (Eds), *Designing Portals: Opportunities and Challenges*, Information Science Publishing, Hershey, PA, pp.7-27.
- Katz, R.N., Goldstein, L. (2002), "Portals: summing up", in Katz, R.N. (Eds), *Web Portals and Higher Education: Technologies to Make IT Personal*, Jossey-Bass, San Francisco, CA, pp.155-62.
- Fleischman, J. (2001), "Portals for education: build or buy?", *Converge Magazine*, Sept, pp.38-40.
- Van Brakel, P. (2003), "Information portals: a strategy for importing external content", *Electronic Library*, Vol. 21 No.6, pp.591-600
- UKOLN (2003), "Base-line portal specification – JISC IE architecture", www.ukoln.ac.uk/distributed-systems/jisc-ie/arch/portal/spec/, (accessed May 3, 2008).
- Awre, C. (2003), "Portals: enabling discovery for all in higher and further education", *VINE*, Vol. 33 No.1, pp.5-10
- Issacs, N. (1999), "Looking at Web portals", <http://www.builder.com/Business/Portal/index.html>.
- Augustyniak, R.H., Agüero, D.B., Finley, A.M. (2005), "The IP's guide to the galaxy of portal planning", *Online Information Review*, Vol. 29 No.3, pp.283-295
- Cloete, M., Snyman, R. (2003), "The enterprise portal – is it knowledge management?", *Aslib Proceedings*, Vol. 55 No.4, pp.234-42.
- Raol, J.M., Koong, K.S., Liu, L.C., Yu, C.S. (2003), "An identification and classification of enterprise portal functions and features", *Industrial Management & Data Systems*, Vol. 103 No.9, pp.693-702.
- Fraser, J.C. (2001), *Taking a Content Inventory*, available at: www.webtechniques.com/archives/2001/10/fraser/, (accessed May 3, 2008).
- Boiko, B. (2002), *Content Management Bible*, Wiley Publishing, New York, NY, .
- McGovern, G. (2001), "Web classification is essential", *New Thinking*, available at: www.gerrymcgovern.com/nt/2001/nt_2001_11_26_classify.htm, No.November 26, .
- IBM Business Consulting Services (2004), "Implementing a governance policy for on demand workplace success", available at: www-03.ibm.com/industries/consumerproducts/doc/content/bin/imp_gov_on_demand.pdf, (accessed May 3, 2008).