Evolving Role of the Information Center:
Challenges and Directions

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Abstract

The paper provides a critical review of the development of information center through different phases, transformation of the information center in response to the inter-disciplinary imperatives of information and knowledge management, IT imperatives, trends in the areas of content, services, management, and personnel, and future possibilities and prospects. An extensive review of literature was made in order to discern trends and analyze the current situation in pertinent areas focused in this paper. It was noted that the information center has changed through different phases. Information and knowledge management have made a distinct impact on the dynamics of the center. Changes in resources and services, IT applications, user community, and management practices are most evident. These factors have been critical in shaping the identity and substance of the information centers. Based on this analysis, challenges facing the information centers have been elaborated. Best practices in specific areas in the developed nations have been highlighted. Future of the information center is projected to be dynamic, enterprising, and challenging. This review is useful for taking strategic cues for planning and managing the information centers.

Keywords: *Information centers; Knowledge management; Librarianship; Information management; Marketing of LIS; ICT and Information Centers*

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Introduction

Role of special libraries and information centers has constantly been changing during the last hundred years or so. Tracking down these changes can be approached from two angles -- historical and functional. The purpose of this paper is to review the primary developments in the character and identity of the information centre during the last two decades. Additionally, this paper aims at analyzing the trends that have shaped the functioning of the information center in the areas of content, services, management, and personnel. This review is used for analyzing the current state-of-affairs and projecting into the future of the information centers.

In this paper, the term information centre has been used in its generic sense. The term can be used interchangeably with other terms such as special libraries, technical information centre, information resource centre, etc. Since a distinct emphasis is noted on the corporate setting of the information centre in literature, the term *corporate* information centre also figures repeatedly in the paper.

Evolution

First 75 years of special librarianship

If we take the founding of Special Libraries Association in 1909 as the year when special librarianship was formally instituted, we understand that it gave an identity to those who worked in specialized institutions with specialized resources and specialized needs of their specialized clientele. Like the mainstream librarianship, the early decades were more like dignified craftsmanship without much professional touch. As library education moved to universities, we find that a sense of professionalism was gradually infused into the profession. Later, during late 30s, we find an emphasis on micro-reproduction and a

wave of documentation, which paved the way of new indexing, search and retrieval techniques. International conferences of 50s provided a renewed focus on the organization of S&T information and Keyword in context (KWIC), keyword out of context (KWOC), chain indexing, and coordinate indexing. Garfield founded his ISI and issued the pioneering service of Content Pages in diverse fields, giving special librarianship a new rigor. During 1960s, like other libraries, special libraries also flourished, as they received funds generously. Research in retrieval and advances in computing are responsible for the medical database of NLM, followed by ERIC, which were then followed by scores of such products during late 60s. When the American Documentation Institute was renamed American Society for Information Science in 1966, it could be treated as formal induction of information science (Gates, 1997; Lilley and Trice, 1989; Porter, 1997)*.*

Since 1960s, an increasing number of S&T and corporate technical libraries have been re-designated as information centers or technical information centers; a trend that gained momentum in the later years. These changes in Labels reflected a shift of focus on customized services and access. New dynamics of information services prompted fresh approaches for accountability and valuation. The users became keener for desktop delivery of information and documents. Advances in ICT and networking have brought new opportunities and challenges for these information centers (Davis & Rush, 1979; Rubin, 2000; Saracevic, 1970).

From the preceding review, we may infer that the tradition was focused on in-house resources, assistance to users on - demand, emphasis on processing and acquisition, and a self-contained outlook of the professionals. Since 70s the emphasis has been on analysis of user needs, constant dialog with customers, focus on access and delivery, and a new relationship with vendors and other stakeholders. As a result, the professionals had to assume a new role in outreach, public relations, and marketing. The financial hardships of 80s forced these information centers to prove their worth in dollar terms. We also noted many

closures, layoffs, retrenchments, and cutbacks during this period. These centers became aggressive consumers of the latest technology.

Information management (IM) & knowledge management (KM) era

As corporate information centers entered the information management era around mid-80s, they were expected to play a different role. Internet changed the whole scenario of networking, publishing of information, and communication. Other technological advances also supported this major transition. These centers took a lead role in the creation of databases, information systems, digitization of resources, creation of virtual libraries and development of intranets, extranets and portals in their companies. Their professionals had to be well versed with fresh expertise of information architecture. They had to use new techniques of data warehousing and data mining for organization of information. They were also expected to assume a proactive role in packaging of information and its desktop delivery to their users. The exercise required collaboration with other key players in these activities - the IT professionals and those active in the business domain (Cortez, et al. 2004; Rubin, 2000; Tanner, 2001).

Choo (1995) viewed that in order for these information centers to thrive, an intelligent organization had to bridge the knowledge of its domain experts, information content experts, and information technology experts. They had to help steer and shape information policies, structures, processes and systems that nurtured organizational learning. A high order meta-knowledge had to be developed for focusing on different activities and their interrelationship. Henczel (2001) maintained that information audit was the key by which an organization could better understand how the tasks and activities that it supported could contribute to its success.

As KM found its roots around mid 90s, it has increasingly been applied in corporate companies. Corporate information

centers had to respond to this new demand. In recent years, a body of literature has emerged that explicitly addresses knowledge management from the perspective of library and information professionals (Broadbent, 1997; Nicholson, 1997; and Loughridge, 1999; Wilson, 2002). Choo (2000) asserted that if librarians had to manage knowledge in organizations, they had first to understand what knowledge is; what the nature and structure of organizational knowledge is and what makes it distinct from other forms of knowledge. Broadbent (1997) maintained that librarians were generally driven by a desire to provide access to information sources and they matched this desire with values that assumed information sharing as a good thing, quite critical for the practice of knowledge management. However, these are not sufficient. He made a point that no single group, organization, profession or industry had the claim of owning knowledge management. But, if libraries and information centers wished to be the key players in KM, they needed to understand the multitude of perspectives of other players.

A great deal of confusion has prevailed in the library and information science (LIS) community about the relationship of IM to KM (Breen et al., 2002; Davenport & Cronin, 2000; Loughridge, 1999; Oxbrow & Abell, 2002; Southon & Todd, 2001a). Broadbent (1998) clarified that KM enhances the use of organizational knowledge through sound practices of information management and organizational learning. There also exists a considered view that KM is at least partially reincarnation or resurrection of familiar library and information management processes and procedures (Koenig, 1996; Broadbent, 1998). Davenport and Cronin (2000) made a strong case that librarians in general were confused about the transition from IM to KM and they mostly took it as a semantic shift. They emphasized that KM used the approaches of analyzing context and activities with an extended tool kit of ontology construction, activity analysis, interaction design, and genre analysis. Southon and Todd (2001a) also noted that the concept of KM was reasonably familiar to most participants, yet the view was fragmented as most of them focused on explicit pieces of

knowledge and these were also seen in isolation to other functions, processes and personnel. They perceived IM to be well-defined, achievable technical processes, dealing with hard copy or digital resources, and system-based. KM was perceived to be complex, holistic, involving organizational issues and human and social processes. In a subsequent paper, based on the same research, Southon and Todd (2001b) identified what understandings were required if these professionals desired to have an effective KM role. They grouped them as 'knowledge about knowledge, organization, technology, people, and information. Loughridge (1999) holds the view that KM differs significantly from the theory and practice of librarianship, information management, and information resource management. He outlined the new set of skills that are needed for the new role. Koenig (2000) noted that the areas of IT applications, corporate culture, business background, and knowledge organization were most significant for LIS professionals and he developed a checklist for the design of curricular content of LIS. Butler (1998) pointed out that many KM initiatives were seemingly concentrated in the familiar territories of LIS, but had not been initiated by the library professionals.

Abram (1999) challenged the notion that special librarians were neither in the information business nor could they manage knowledge. He argued that only the knowledge environment can be managed and here librarians could play a vital role as a key catalyst in the knowledge continuum. Abell & Oxbrow (2001) linked KM competencies to information management skills and observed that the professionals with information management expertise could add significant value to the creation of KM environment.

Marouf (2004) investigated the perceptions of six leading corporate information managers how they felt about IM and KM and what had been the contribution of their libraries/information centers toward KM initiatives in their parent companies. She noted that majority of them articulated key differences between IM and

KM - IM being largely technical and service oriented while KM having a people-centric approach. They noted that the philosophies and approaches diverged despite a great deal of convergence on infrastructures and technologies. However, she noted that just a couple of these information centers were engaged in hardcore KM activities, making a significant contribution to the overall organizational initiatives. By and large, the others are primarily engaged in IM activities and services.

Confusion prevails whether KM is a fad or it is developing as a bona fide discipline. Oxbrow and Abell (2002) asserted that KM label might fade, yet the practices would be penetrated in organizations and would be embedded in organizational strategies, policies and values. Features like taxonomies, indexing and classification, typically the domains of librarians, are being developed in all types of organizations. Here, the information professionals will have to work in teams with IT, organization development (OD) and human resource (HR) people. McInerney (2002) argued that effective KM in many disciplinary contexts must be based on the understanding of the dynamic nature of knowledge itself. Many of the information managers lacked the capabilities of journalist-like skills of capturing, recording, and reporting new knowledge. Prusak viewed that information professionals had to come up with drastically different understandings and outlook. They must be engaged in human networking, believing in the notion of 'access to right knowledge at the right time.' He noted the technology-centric KM would be a disaster and the notion of virtuality defies relationships and creativity, essence of the social organizations (Cagna, 2001). On the other hand, Wilson (2002) believes that KM is an umbrella for a variety of organizational activities, none of which is concerned with the management of knowledge.

Lamb, manager of the Knowledge Resource Center of the Buckman Laboratories, asserted that librarians needed to serve as infomediaries in organizations with the capability and expertise to connect people with the information they need in order to build a

balanced and sustainable knowledge management program. Information Outlook has contained articles briefing different knowledge sharing strategies that information professionals need to develop. Notable among these are Kahan's (2001) demonstration of the technique of storytelling and strategic guidelines of Lee and Valderrama (2003) for the creation of communities of practice.

Koenig & Srikantaiah (2002) analyzed the development of the field of KM and noted that it was now entering its third stage. The earlier two stages pertained to IT where intellectual capital, intranets, extranets, and Internet were the primary tools. In the second stage, tacit knowledge, communities of practice, organizational culture, and organizational learning were the hallmarks, as pioneered by Nonaka and Senge. As we entered the third stage, content management is becoming the focus. In this stage, LIS community can play a major role, but the corporate world does not recognize their competence in this area. They observed that KM maturation into this third stage might give librarians an opportunity to bridge the gap. Kabadse, et al. (2003) explained that one way of approaching the intellectual analysis of knowledge management and knowledge strategy was the use of knowledge mapping, which itself led to knowledge organization approaches (Stanford, 2002). Perez (2002) maintained that corporate libraries could play a substantial role in KM processes if they move away from old paradigm of information service and delivery. It will involve intensive effort in communication and social interaction throughout an organization, as well as effective methodologies and facilitation in the capture, identification, synthesis, and recording of human knowledge and experience.

If we examine these responses in conjunction with the activities of information centers, discussed in the preceding section, it is obvious that some information centers have assumed new service roles, identities, cross-functional involvement, and infusion of the latest technologies. This has resulted in a higher degree of visibility and appreciation for them, while also bringing

new challenges for their sustenance. There have been widespread applications in the development of knowledge repositories and databases of best practices and lessons learned. Use of Intranets, portals, and sharing technologies is also pervasive. Role of corporate information center has largely been limited to IM applications within KM domain. There are opportunities for their engagement in content organization, a new phase, as Koenig had analyzed. Variations in applications are clearly related to factors such as organizational mission, size, culture, business peculiarities, markets, and management philosophies.

Functional Changes in Roles

Around early 90s, a number of studies and writings commented on the role of the corporate information centers and the future of these centers. Based on a survey of 164 companies, Matarazzo and Prusak (1990) made the following three primary observations: (1) the most valuable service libraries provided was searching; (2) they had no objective means of assessing their value, and (3) few executive perceived them to be 'mission critical.' Walsh (1999) replicated the same study in Australian setting in 1997 and found similar results. One of the findings was that only 47 of the 83 companies among the top-100 had corporate libraries and there was only 8 percent prospect that there might be some funding for library in the following year in the companies that did not have libraries. Around the same time, back in 1990, Matarazzo had picked 13 corporate libraries that had excelled in their operations and contributions. The study indicated that there existed a fit between executive support, leadership quality, staff capacity, and user expectation that created the dynamics of success. Davenport and Prusak (1993) had taken a highly critical stock of the situation of the corporate library. This oft-cited paper 'Blow up Corporate Library' was critical of the marginal role these libraries were playing in corporation. They thought that these libraries operated under the wrong and obsolete conceptual model of a 'warehouse.' They urged that there was a need to transform the corporate library into an 'expertise centre' and a 'network.'

Since these writings appeared, the realities about environment, context and users have changed in a fundamental way. Basic changes in the economic environment, pace of technological advances, and introduction of new organizational approaches such as IM and KM are some of the factors that have retransformation information centers. In the following sections, we review changes in the roles of these centers with regard to distinct operations and services.

Content management

The corporate world has witnessed a major transformation when it comes to the content it has been dealing with. Internet has made the most compelling influence on the medium of content, its organization, and means of access (Gelernter, 2001). Digital and virtual libraries are a natural outcome of the movement of digitization and networking. Companies have increasingly used the technologies of intranets, extranets, and portals for specialized techniques of content management and deployment (Watson, 1999). This information has been put to distinct business advantage by using the techniques of data warehousing, data mining, taxonomies, ontologies, and company-specific knowledge maps (Cheng and Chang, 1998). Lemon (1996) elaborated the use of infomaps for content management at Owens Corning while Bray (2002) stressed the need of using visuals for laying out knowledge maps, which would make search and retrieval much easier and enjoyable. Available visualization technologies need to be employed for this purpose.

Digitization. One of the foremost trends in the corporate information centers was to deal with the diversity of content media they had to contend with. They have spearheaded digitization of their content and development of organization and service strategies. Shaver and Enright (2002) documented their discussion about different aspects of digitization with the corporate information managers of Axelroth & Associates, Wilmington

Information Science, and 3M. 3M initiated digitization of technical report literature as early as in 60s and has been providing desktop access to its users since 80s. From these discussions, we may conclude: (1) digitization is practiced in many companies, yet these organizations keep print substitute for a variety of resources and do not anticipate paperless centers; (2) these centers deal with expert users, yet there is a definite role for the professionals in search and access services; (3) there are technical issues about possible backup; (4) copyright, licensing, and changing patterns of production create complex situations; (5) creation of databases and indexing schemes are posing challenges for search and retrieval; and, (6) integration of externally produced resources and internally digitized resources for awareness services and other purposes.

Stratigos and Strouse (2001) maintained that while moving to a virtual environment, information professionals had to contend with the issues of vendor reticence, technological fragmentation, wavering user preferences, budgetary challenges, and unknown futures. They covered the breadth of the functions and services of a virtual library. Alsmeyer (2001) described the shift they had from physical to digital collection and how it helped them in relating to the changed work context. Pack (2000) described the experience of conversion from a physical entity to a WebLibrary at Compaq in Massachusetts. Important features of this conversion were content integration, user-based system design, and the development of a high degree of synergy between library and IT personnel. Serving a population of 65,000 users, the WebLibrary recorded half a million views in a month. It had created a collection of 1.2 million fully indexed online documents – over 18 gigabytes of data. Twenty vendors had to integrate content with their digital resource in accordance with their technical specifications.

Information centers are now responsible to produce the new content in standard formats for production and organization. Primich and Varnum (1999) reported that the corporate library of the Ford Research Laboratory initiated the process and faced a

number of problems of production, technological applications, and using metadata for their retrieval. Outsell (2003) reported that the pace of going digital was slowing. The shift in spending on electronic vs. print content was lower in 2003 as compared to the previous year.

Use of portals. One real challenge for the companies is to access intelligence data from Internet, intranets, and other electronic resources in an effective and cost-efficient way. Portals have been the software solution sought by most companies as an effective means for content management and delivery. Gallagher (2001) noted that the premium solutions provided by Dialog, Factiva and other similar companies had major cost implications. Public solutions such as Yahoo, Alta Vista, and Northern Light were economical, yet these hybrid solutions failed the company and customer needs in terms of relevance and specificity. Portal development is the result of collaboration and content, an intelligent solution that addresses concerns for individualization, customization, and personalization. These software solutions offer push-pull technologies that transmit information to users through standardized interfaces. They integrate content management, business intelligence, and data warehouse information and have packaged applications that target their content toward a particular function or industry.

Role of vendors. Role of vendors has become crucial in content management. Corporate information centers have to deal with new types of vendors with the issues of pricing, licensing, and copyright. They need to be real astute in their contract negotiation. Duberman (1998) gave the example of EBSCO's Collectanea in supplying periodical content and value-added services by resorting to new media of content and structure. It required a fresh approach on the port of corporate information centers in dealing with vendors. Lemon (1996) also elaborated how subscription to vendors was evolving into a strategic partnership. Outsell (2003) reported that there was a slight increase in the number of vendors

with whom the corporate information centers planned to have contracts during the next year.

Management

Evidently, changes in management policies and practices impact the functioning of the information centers. Management trends indicate that the information centers are undergoing major changes with regard to their strategic planning and decision making, organizational relationships and connections, physical dimensions, fiscal aspects, personnel, valuation and measurement of their processes and services, and marketing and public relations. Heyman (2001) emphasized the need for creating partnership with IT professionals. She noted that today's corporate environment demanded cross-functional teams that could collaborate effectively and resolve business problems. Mutual trust could be cultivated through a demonstrated level of competence, focus on the needs of work processes, and the willingness to acknowledge limitations.

Strategic planning and decision making. Dearstyne (2000) noted that information centers had to assume a new strategic role in managing their affairs, relationships, and services. They had to engage in enlightening the stake-holders; articulating public interest; instituting effective mediation among people, information and technology; using new approaches for solving today's problems; responding to emerging user expectations; networking creatively; improvising; measuring and interpreting the value in an intelligent manner.

Jacobson and Sparks (2001) highlighted the significance of strategic planning for corporate information centers to align their plans along strategic directions of the company, fiscal realities, and technological imperatives. Any plan would entail determining the central value propositions and objectives, conducting opportunity assessment, building strategic maps, and having an implementation and measurement system in place. Willmore

(2001) urged that corporate managers needed to use the technique of scenario planning for their strategic pursuits. He noted that the technique facilitates learning and strategic discussion within organization and they can also check their assumptions about library resources and services.

Marketing and public relations. It has been recognized that if information centers had to survive and prosper, they had to adopt aggressive strategies of marketing and public relations. Chochrek (2000) urged the importance of using a variety of traditional and electronic tools for effective communication, both internally and externally. These managers need to play politics of the organization to ensure that they have a visible status. Stuhlman (2003) argued that a goodwill program ensured positive return on investment. Kassel (2002) cited examples of marketing strategies used in HP, Carr Research Group, and J.J. Keller and Associated and noted the importance of developing institution-specific marketing plans, using outside consultants, creating support alliances within companies, and setting aside finances for these tasks. Dawson (2003) discussed how today company has relied upon networks that harnessed the flow of marketing, customer feedback, and knowledge. The 2003 Outsell report indicated that companies placed little emphasis on marketing.

Steele (1997), reporting the case of her company, stated that while her library faced the threat of extinction, they had developed a strategic transformation model in which 34 staff members were organized into information managers, research analysts and knowledge facilitators. It was through her information networking model that the corporate library strived to attain a strategic visibility and partnership through an aggressive campaign of collaboration and visibility. Kopp (1999) referred to the political dynamics that threatened the creation and funding of the virtual library and posed a serious challenge. These walls could be brought down through political process of discussions, open communication, attitudes, and appropriate levity.

Placement and reporting relationships. Organizational placement and reporting relationships of the information centers are considered to be vital indicators for their access to the top management, visibility, and strategic positioning. Outsell has been conducting research about the prevalent trends in corporate information centers. In 2001, 15% of these centers reported directly to the chief executive of the company while in 2002 the number rose to 28%. However, a reverse trend was reported for the year 2003 when only 8% of them reported directly to executive management and more were positioned in administrative divisions.

Personnel. Outsell (2003) reported that staffing levels were slightly up by 5% during the year 2002-03. The average corporate information center had one staff for 208 actual users. Henczel (2001) noted that the professionals needed to develop expertise to analyze and evaluate the information needs of their organization, identify the information resources that contributed to business objectives, and establish a foundation from which to develop a policy to coordinate and manage their organization's knowledge assets. Abram (1999) perceived knowledge management as an opportunity for information professionals, if they were willing to apply their skills in alliance with information technology professionals. In a research conducted for the UK Library and Information Commission. TFPL noted that LIS profession had developed and changed significantly during the last decade in a way that affected the roles and opportunities for information professionals. They emphasized that KM presented a unique opportunity for LIS professionals, if they recognized the complete picture on which an organization worked and the role of LIS as partners with a number of other stakeholders. Abell and Oxbron (2001) offered the advice to information professionals to change their mindset for having an enterprising outlook and ambitious career aspirations. Goh (2002) observed that knowledge workers had a complex task at hand and they need to adopt a balanced approach.

Oxbrow (2000) had a highly critical view of the role of information professionals in the knowledge economy. He noted that that LIS professionals did not have strategic understanding of business, lacked breadth of experience and mindset, and did not have the ambition needed for risk-taking ability. They were also unprepared to go beyond the realm of explicit knowledge. Gregory (1999) noted that if the professionals had to function as effective team members in a learning organization, they had to proactively work with other members. The real challenge for them is how they packaged knowledge to make it usable by individual knowledge workers and communities of practice. Mosenkis (2002) noted that the bitter economic realities created threat of retrenchment, layovers, and frequent and unpredictable changes of managers and executives. All these factors created a threatening situation for information centers. These centers needed to provide continuous career development opportunities to their personnel who might apply their new capabilities in their work-settings. This might empower both the centers and the professionals in order to cope with these changes. In an interesting scenario-building exercise, Horton Jr. (2000) took cues from the developments during the last 50 years and projected into the impending stages of evolution of the information professional. He outlined these developments through the stages of data analyst, information manager, chief information officer, chief knowledge officer, wisdom administrator, and an executive head. It reflects how the roles have evolved with the passage of time as changes took place in the character, identity, and nomenclature of the information center in the corporate world.

Physical dimension. A number of factors have contributed to diminishing spaces. Availability of electronic resources; digitization of internal documents; connectivity with systems, departments and users; user preferences; new architectural considerations; and economic pressures for cut-downs are driving the information center toward virtuality. Outsell (2003) analyzed that geographic location was less and less important, concomitant with the increased focus on digital content and electronic

deployment. Finnerty (2002) cited a number of examples of corporate information centers where they were forced to move to small quarters, merge with other facilities, and other similar moves. He observed that today's corporate information centers need to have the capacity to function anywhere in its new role of more like a production shop. Skadden Arps, a major law firm, decided to allocate 70% of the library space to other units. Pfizer had to contend with the issue where there was a demand for hard copies, yet no stacking space was available. A number of firms, after 9/11, moved to much smaller quarters and their information centers functioned well in these premises that were more like virtual. Lehman Brothers, Deloitte and Touche, and Merrill Lynch were among these firms.

Financial strategies and budgeting. It is a matter of common knowledge that recession; rising costs, growing demands, and needs for continuous change and development make an extremely difficult financial situation for these centers. It is quite common to face drastic budget cuts. St. Clair and Reich (2002) focused on the concept of knowledge services for developing financial strategies. The first point in the strategy is that the management must buy in the need and justification of these services. These centers have to identify advocates for these services, involving pre-selling, making deals with stakeholders, and accepting the wisdom of those having experience. One crucial strategy could be charging for the services. The centers need to count on the crucial support they can get from consultants. Outsell's 2003 report indicated that during the year 2002-03, the budgets had dipped about 7%. It was further found that there existed a wide variation between industries; large companies and manufacturing have very low per user funding whereas business services have a five time higher spending per user.

Outsourcing. Information centers have been using the strategy of outsourcing for a number of technical processes, content deployment, and maintenance of ICT. SLA commissioned Portugal (1997) to analyze the outsourcing practices of seven

companies; two of which had adopted complete outsourcing. Corporate downsizing and restructuring were the primary motives. Normally subscription services are picked for partial outsourcing. Most of these companies did it with little strategic planning that presented threats to professionals. Lesky (2003) cited a case where 8 of the 9 staff members had been laid off, yet the center excelled through effective outsourcing. Mostly technical services are the first candidate for outsourcing. If used effectively, outsourcing could carry the benefits of better expertise, effective services, and flexibility. Agada (1997) maintained that corporate libraries were threatened for their existence, as all the traditional services were candidates for outsourcing. Now these libraries needed to shift their focus to diagnostic level of service and information counseling on multifunctional project teams, if these had to survive in the new environment. Outsell (2003) reported that corporate information centers continued to outsource activities that they had chosen to offload as non-core or low value during the year 2002-03.

Valuation and measurement. Corporate world takes nothing for granted and allows funding to only those departments that could establish their worth in net dollar terms. During the last few decades, we can find a series of initiatives within corporate information center urging a variety of methods, tools, and strategies that could measure the value of their products and services and prove return on investment (ROI) in definite terms. Marshall (1993) conducted a study during 1991-92 to ascertain the impact of special libraries on decision-making. She collected data from 390 randomly selected corporate managers. The results showed that the managers perceived that the information that they received from libraries had a significant impact on their decisions. Special Libraries Association published two monographs in 1993 and 1994 (Griffiths & King, 1993; Matarazzo, 1994) that had a clear focus on achieving an edge through establishing worth of the library. Both the works laid down conceptual foundations and elaborated on different strategies and techniques that could be used for measurement and evaluation. Koenig (1992) has also

proposed the use of quantitative metrics for the ascertainment of value.

Matthews (2003) reviewed earlier literature on the subject and reiterated the need for using output and process measures for proving ROI. Strouse (2003) emphasized the metrics already proposed, proving worth in the measures of *time saved* and *dollar saved*, need to be applied together with qualitative assessments. These centers had to integrate ROI data collection into their processes. A number of other recent writings have pinpointed different benchmarking measures and strategies that were relevant in different contexts of corporate settings (Deutsch, P. and Silcox, B., 2003; Henczel, S., 2002; Poling, N., 2002). Against this backdrop, we find this trend from Outsell findings that there are few who track return on investment and report on the value to decision makers though half of them have business plans and strategies, a large number having them formalized.

Users and services

The nature and complexion of the user community of have also been changing. User empowerment and literacy are looked upon from a new angle. Most significant changes are in relation to the location of the user, new access modes, networked functioning, and desktop delivery. It has resulted in remote access of information resources, services, and products. User demands and expectations are also changing fast and the information center has to respond to them by using fresh approaches of alliance-creation and partnerships. They have to adopt new roles of diagnosis of service and information counseling on multifunctional project teams (Agada, 1997). Today, these centers are typically offering services that have little to do with the traditions that were found till 80s. Searching, which had been the most significant prerogative of information centers, has largely been taken over by end-users. Now, there are diverse demands for packaging and desktop delivery of information. Information centers have to deal with internal and informal knowledge by using new technologies

and approaches. We will be discussing some of the significant changes in the following section.

Competitive intelligence. Design of a competitive intelligence system for a company requires discrete planning and execution at both strategic and tactical levels. Shelfer and Verner (2001) drew a roadmap for the design of an indigenous intelligence system. Keiser (2002)) outlined a strategy for the conduct of competitive intelligence. It entailed the following steps: identify competitors, select criteria to benchmark operations against the competitor, employ a variety of methods for collection of data about the competitors, assign responsibilities for data collection and analysis, analyze data and build a comprehensive profile of each competitor, conduct your own information audit, have constant and open discussion with staff, revise your plan by making adjustments, communicate results to management and other stakeholders, and continuously monitor the competition's actions.

Hohhof and Chitwood (2000) observed that few information professionals had moved to positions of intelligence analyst. They addressed the question why many corporate information centers were not active in providing this service. The results of this research indicated that the key characteristics for the analyst included intellectual curiosity, balance in an environment that contains chaos and uncertainty, intuitive thinking, diplomacy and confidence, self-direction, focus on problem solving, logical skills, understanding of business issues, strong oral and written communication skills, and persistence.

Customer focus. Today's corporate information centers are expected to focus on the needs and expectations of their diverse customers. Konieczko and Powell (2003a) described how two leading corporate information centers had created their portal and Web utilities by focusing on what the customers needed for their research and professional and managerial needs. At MITRE 'knowledge zones' provide a customer-oriented method of

categorizing elements for research portals for internal and external content. The BlueCross BlueShield of Florida intranet has a research portal that is organized by channels to meet the information needs of each major client group. The National Institute of Standards and Technology (NIST) research library analyzes user needs and perspectives as part of their performance assessment exercise. Silcox and Deutsch (2003) reported the findings of the analysis of 528 respondents. The Center noted user dissatisfaction in a number of areas and came up with marketing strategies to address a number of issues that surfaced in the survey. Nielsen (2003) profiled the transformation strategy he used at Hazen and Swayer by focusing on establishing patterns of communication and services, applying foresight in getting ahead of the curve, and applying the risk-taking outlook in exceeding user expectations. Pack (2000) described how Compaq's WebLibrary was using actual users for testing any innovative service they were introducing. They also used search logs and survey using JavaScripts and continuous analysis of user needs. Against this backdrop, it is worthwhile to note that a significant trend reported by Outsell (2003) was that during 2002, the average number of actual users had dropped about 21% while they had a potential user estimate drop by a whopping 35% for the following year.

Empowering customers through literacy. Literacy, typically the domain of academic institutions, has gained a new momentum since KM has placed a great emphasis on empowering employees in intelligent use of knowledge. It serves as an underpinning for both KM and learning organization initiatives. Many information centers have attempted to capitalize on these initiatives. Oman (2001) reviewed different areas in which these employees needed to develop skills, which are: information infrastructure of the organization, availability and access to external and internal content and integration of these competencies to their work. The employees need to be empowered about the construction and leveraging of personal and corporate knowledge bases. Vine (2001) maintained that the users lacked retrieval skills that could

help them in extracting needed resources. They needed to develop a mental sense of the Web. Most of them are also clueless about research and information gathering process. An appreciation of these facts might help the information center in coming up with strategies for cultivating literacy skills among users.

Future Prospects

Future of the information center is predicated on a number of factors, including organizational plans and needs, ever-evolving user expectations and demands, technological imperatives, industrial and economic pressures, and budgetary parameters.

Best practices

Konieczko and Powell (2003), mandated by TFPL, studied the following six corporate information centers in various contexts that were perceived to be most innovative: The Baltimore Sun in Maryland, BlueCross Blue Shield of Florida, Franklin Templeton Investments of California, Freddie Mac in Virginia, MITRE Corporation of Virginia, and National Association of Home Builders in Washington, D.C. Some of the strategies these centers had used were reported as follows: MITE developed a system for constant user input and feedback; Franklin Templeton established a clear case of ROI and had a three million dollar saving through consolidation of accounts; MITRE's empowered its users by allowing them to order their own subscriptions and publications, BlueCross and BlueShield introduced Lunch and Learn session series; National Housing Resource Center used annual show of 71,000 builders as a venue for reaching out its builder-members; and, BCBSF applied the novel ideas for handling corporate archives. HP, a corporate giant and the most innovative leader of KM, also provided description of the way it had achieved a cutting edge. The central library is the main hub of a decentralized system of 28 other international libraries. Its main web site hosts 215 gigabytes of information with more than 5 electronic newsletters

and databases. There is a constant decline in the traditional service and they are placing greater emphasis on creating alliances with others for KM initiatives.

Marouf (2004) collected data from six leading companies. She found that one of these companies was involved in taxonomy building, use of intranet for networking staff from 76 countries, creation of hundreds of portals, development of best practice database, design of new search tools, and emphasis on virtual library. Another major office automation company had a greater emphasis on literacy programs, extensive search services, variety of activities for information architecture, creation and maintenance of a knowledge repository, design of research portal, and development of a comprehensive directory. Boeing center was engaged in taxonomy and ontology, development of an in-house thesaurus, use of intranet, in-depth searches, creation of databases, user training, and initiatives of virtual library. A company specializing in design placed emphasis on creativity in design by using their 'design' web site, involvement in ongoing research and conduct of specialized searches, placement of visual resources on intranet, literacy programs, and conducting exhibitions for promoting creativity and innovation.

What does the future hold?

The future is uncertain and ambiguous. However, there can be no denying that the future is shaped through today's thought and action. What we find in today's trends is an objective pointer to the possibilities of future. Newman, et al. (2001) predicted that no profession would undergo more radical changes between 2000 and 2010 than will be the information profession. They discerned four trends, most significant for the corporate information center and the professional: search potential of knowledge content increasing by leaps and ten time more search results expected in as many years, number of information staff remaining more or less constant, new software tools emerging to meet the challenge of abundance, and new forms of information

resulting from searches that would add intrinsic value for users. They came up with this formula:

More information + new tools + heightened demand = challenges and opportunities

Lettis (2000) asserted that the paradigm for today's information centers has shifted from a mode of gathering, collecting, and protecting data to the modes of choosing, evaluating, organizing, and distributing information for maximum sharing potential. In this transition, the information centers need to be more businesslike, cultivating partnerships with business colleagues and IT professionals; capitalizing on innovation for growth and expansion; adding value to information through filtering, synthesizing, messaging, and packaging; and, using business metrics for proving value and worth. There are a number of compelling influences and a thrust on digitization that will affect the place, content, use, and access in the information center. This would carry implications for organizations, vendors, and content deployers (information professionals). Outsell, in its 2004 TrendAlert, made the following predictions about the future, which are summarized as follows:

- IT industry has started dealing with content and it would be increasingly bogged down in aggregation, packaging, and pricing activities.
- Content from different sources and vendors will be blended into one mega-offering accessible from the user's digital workplace. Internally generated information would be integrated with commercially available data. Then taxonomy, search, browse, and other tools would be layered on to make it possible for users to access the content they need. Technology will evolve role-based and contextually aware models for content integration and deployment in order to meet users' needs. These influences will compel redefinition of the library of tomorrow.

- The future digital library will provide a single, concept-based search capability across all relevant data sources and types, translating search terms across disciplines, eliminating the need for users to know where to look or how to search within a particular domain.
- The corporate virtual libraries are converging into larger information portals, which serve as gateways to internal and external resources and may also provide a collaborative or community environment.
- Users are overwhelmed and overloaded by the sheer amount of information and they seek simplicity in access and retrieval through integration. In this context, screen and information would become increasingly indistinguishable.
- Economic pressure to downsize physical assets would further accelerate the closing of corporate physical libraries or will result in their reincarnation as shared workplaces, meeting points, or areas used for other communal purposes.
- Future information professionals will become business analysts, students of their organizations, who understand what the business processes are and connect this understanding to their knowledge of content. They must understand intimately information needs in the context of myriad roles and responsibilities in the organization and translate the working and information behaviors of the customers.
- Vendors will have to come up with creative solutions that would simplify content deployment, access, and use.
- Information literacy and need-driven training of the user will be essential for tomorrow's efficient consumer of information.

Konieczko and Powell (2003) identified that the corporate information centers faced the following challenges: maintaining or even expanding products and services with fewer resources;

ensuring continued perceived value of the information center despite increased end-user access to research and KM tools; staying up-to-date about KM tools and the accompanying technological advances; developing and maintaining a corporate intranet in additional to normal work; transforming corporate archives from hard copy to electronic, from physical to virtual; and expanding service delivery from a single location to multiple offices nationally or internationally.

Three major forces affect the information center's role in organizations across industry lines: (1) the current economic downturn, (2) the overall economic trend toward globalization, and (3) dizzying technological advance in KM. Only those corporate information centers are expected to prosper that will assume an effective role in IM and KM initiatives. They need to be aggressive in market segmentation, developing an understanding of the corporate business, becoming strategic partners in decision making, and transforming their operations in accord with today's realities. The corporate information centers need to engage in strategic planning, demonstration of ROI, virtual information exchange, and accurate and current information from external and internal resources with sensitivity to deadlines and economics.

Ideal Services in an Information Center

Could there be an ideal service model that each corporate information center might emulate? The answer cannot be in affirmative. These are the environmental, organizational, financial, technological, and many other local variables that might prescribe what an information center should offer in a specific setting. However, in this paper we have tried to identify a set of general criteria that any center might consider while designing its strategic and operational directions.

What wish-list can we formulate for the purpose? We can envision an information center serving at the heart of the company in terms of its organizational placement and strategic value. It

should have active relationships with its diverse internal and external partners, meaning that it should build cross-organizational partnerships and alliances. It should integrate IM, KM, and learning organization perspectives and deploy the latest approaches and technologies. It should market its services rigorously and respond to the needs of its users proactively. It should be integrated with the projects, plans, and teams within the organization. This information center needs to have financial viability and the company management should feel comfortable in investing in it as they are aware that each dollar spent on it would ensure profit and value-added service. It must have a competent and forward-looking workforce, having the right blend of expertise. It should be recognized as the central information knowledge connection in the organization, serving as the central hub in the organizational network. The high-class knowledge services that such a center needs to offer might include expertise database, community of practice database, repository of best practices, and intranets and portals. It should assume the responsibility of knowledge mapping, taxonomies, ontologies and other appropriate organizational techniques. The center should provide an appropriate balance between the needs of digitization and print resources, depending on customers' needs. It should ensure virtual access to its users and desktop delivery, both on an ongoing basis and mission-specific. It should serve as the focal point for development of literacy and learning skills among employees. The center must be integrated with the business vision and schemes of the company.

This Outsell observation is worth quoting, serving well the purpose of a concluding remark:

> Corporate information centers have adapted and survived – even thrived, in many cases – in the face of a roller coaster economy, rapid-fire technological advances, and the emergence of myriad alternatives for information users, among other challenges. Given their historical ability to ride the

prevailing currents, Outsell believes corporate information centers will continue to lead the information acquisition, management and deployment efforts for their organizations well into the future. Innovative librarians never die; they just adapt to the newest reality and press on.

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