A Discussion of the Emotive Element in Knowledge Service Practice: An Empirical Study at the Chinese Academy of Sciences

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Abstract

With the arrival of the information age, research activities focused on the practice and approaches of knowledge services are on a marked increase as evidenced in the publications of social sciences. According to a social network analysis on knowledge service related literature, it reveals that information and knowledge workers often fail to take such an important element as the functional role of an emotive engagement into consideration in their study of knowledge services. It has increasingly become an issue of high profile with the rapid development of digital libraries and their web-based knowledge services in China and anywhere else in the world. In order to have a clearer understanding about issues involved in knowledge servicing so as to maximize the effectiveness and efficiency of digital libraries in their knowledge service performance, the author has conducted surveys for seven times on the online information seeking behavior of graduate students at the Chinese Academy of Sciences with such research methods as questionnaires, interviews and natural observations during September 2006-June 2009. The research result has showed the emotive element has an important role in the user' s information seeking behavior and in knowledge services practice. Therefore, knowledge services rendered may be more effective by adding the emotiveness-oriented communication element into such practice. This paper recommends that such an emotiveness-oriented communication approach should be carefully studied and factored into libraries' knowledge services practice.

Full Text

Preamble

A Discussion of the Emotive Element of Knowledge Service Practice: An Empirical Study at the Chinese Academy of Sciences

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Abstract: With the arrival of the information age, research activities focused on the practice and approaches of knowledge services have increased markedly, as evidenced in social sciences publications. According to a social network analysis of knowledge service-related literature, information and knowledge workers often fail to consider the functional role of emotive engagement in their study of knowledge services. This has become an increasingly prominent issue with the rapid development of digital libraries and their web-based knowledge services in China and worldwide. To better understand the issues involved in knowledge servicing and maximize the effectiveness and efficiency of digital libraries' knowledge service performance, the author conducted seven surveys on the online information-seeking behavior of graduate students at the Chinese Academy of Sciences between September 2006 and June 2009, using questionnaires, interviews, and natural observations. The research results demonstrate that the emotive element plays an important role in users' information-seeking behavior and knowledge services practice. Therefore, knowledge services may be rendered more effective by incorporating an emotiveness-oriented communication element into practice. This paper recommends that such an emotiveness-oriented communication approach should be carefully studied and factored into libraries' knowledge services practice.

Keywords: Emotive engagement, Personas, Personnel profile, Information-seeking behavior, Digital library, Knowledge innovation, Knowledge service

1 Introduction

With the advancement of Internet technologies and information science, scientists and engineers increasingly recognize the importance of the knowledge service industry. To support the public' s information demands, library and information science professionals perform value-added information services, including: (1) information organization; (2) information integration; (3) information intelligence analysis; (4) data mining; and (5) knowledge discovery (information connection and representation). These services operate from professionally oriented perspectives such as user-driven service, intelligence-driven service, or knowledge-driven service.

Undeniably, traditional knowledge services that provide intellectual content to users are desirable in many aspects. For example, knowledge services can assist users in retrieving desired information more efficiently, exploring information from a broader perspective, and discovering previously submerged information and knowledge. The logic and rationality of "knowledge services" rendered by library and information professionals appear, at first glance, to be a sound solu-

tion for knowledge discovery and innovation. However, upon closer scrutiny, it becomes doubtful whether the resulting solutions have truly captured the attention of information seekers. One may wonder exactly under what circumstances an information seeker' s learning desire can be aroused, stimulated, and led to the process of knowledge innovation.

It is with such puzzlement that we raise the question of whether current knowledge services have indeed neglected the role of informal information communication. As we confront unprecedented opportunities and challenges in our pursuit of learning and knowledge innovation activities in this information era, we need clearer understanding of what digital libraries can or cannot effectively perform in meeting readers' and researchers' needs. Therefore, a thorough understanding through closer re-examination of end-users' information-seeking behavior seems warranted.

This research project began on September 4, 2006, and concluded on June 30, 2009. It contained three preliminary questionnaires (with systematic and simple sampling), one basic questionnaire (stratified random sampling, with average age bias of 4.358 at 95% confidence interval; Cronbach' s Alpha of 0.883 exceeds the 0.5 testing standard), and three follow-up surveys (purposive sampling with questionnaires, interviews, and natural observations). The goal was to develop a more satisfactory new modus operandi for knowledge services.

2.1 Fundamentals of Knowledge Services

The difference between knowledge service and information service is that the process of knowledge is more important than what knowledge a firm and its employees possess [1]. In other words, knowledge services are not only for accessing knowledge but also for knowledge innovation. In the information age, knowledge reflects exponential changes in social, economic, governmental, career, educational, work, and other life activities [2]. Knowledge innovation is both prevalent and vitally important to the sustainable growth of our society. Therefore, knowledge services have an inherent market share in the arena of information demands and supplies.

On the one hand, knowledge service practice depends on the nature of social demands. Tsai et al. (2005) suggest three dimensions for assessing the knowledge-intensive service industry (KISI): staff' s research capabilities, information-seeking behavior, and performance outcome as basic conceptual building blocks for establishing an integrated framework for knowledge innovation purposes [3]. If knowledge services are independent of the academic scene, then another service industry must provide comprehensive research support and solutions to wide-ranging commercial sectors, such as patent applications, marketing, corporate culture, and strategy.

On the other hand, knowledge services should have autonomy. Gano et al. (2007) support three models in this vein: (1) the engineering model, which focuses on the inevitability of science in advancing knowledge; (2) the socio-organizational

model, which stresses the importance of communication between and among groups as the critical factor in promoting knowledge utilization; and (3) the shield model, which fortifies the objectivity of the two models to resist external political pressures on knowledge production and its transmission or dissemination [4].

Generally speaking, knowledge services are closely associated with human intelligence. Knowledge is a high-end product of people and society, created by individuals' intellectual cognitions and intellectual dialogues among educated people. With the arrival of the information age, the knowledge service industry has become a pivotal force to energize and assist knowledge innovation, providing added assurance for the sustainable development of our knowledge society.

2.2 Knowledge Services in Business

There is growing worldwide awareness of the need for knowledge services. For example, international outsourcing services have been a key managerial focus since the late 1980s and became an area of mature research in international business during the 1990s. This is because the service industry confronted a completely new set of challenges, such as globalization of economic development and/or recession [5]. Owing to increasingly widespread and intensified global competition, the role of social networks and cross-cultural approaches for knowledge innovation has become more important than ever. Rajala et al. (2008) studied knowledge-intensive service activities in software business and summarized that these activities are accomplished via networks to mutually generate or transfer knowledge between companies, customers, subcontractors, or industry authorities. They also emphasized that knowledge itself is not an object of trade [6]. Owing to restrictions on exchanging certain privileged information under law and pertinent rules regulating business intelligence activities, markets for both supplying and demanding knowledge services have become increasingly active and thriving.

Even though relevant research on knowledge services is on the rise, views on this issue vary widely. Doultsinou et al. (2009) described manufacturing industry service issues and the impact of knowledge services on product design [7]. Plumb & Zamfir (2009) considered service quality management to be knowledge-driven, relying on people' s continuous development, network-intensive collaboration (sharing ideas and knowledge), and joint value creation to attain sustainable competitive advantage [8]. Rashman et al. (2009) presented a dynamic model of organizational learning exploring four elements: (1) features of the source organization; (2) features of the recipient organization; (3) characteristics of the relationship between organizations; and (4) the environmental context [9]. Shang et al. (2009) provided evidence that a dynamic force could connect external sources or stimulate internal implementation and fulfillment of internal knowledge management practices [10].

People' s views on knowledge services are divergent; however, it is commonly

believed that the rise of knowledge services is an inevitable result of globalization.

2.3 Digital Library for Knowledge Services

There are at least three approaches through which digital libraries can enhance their efficiency for knowledge services in the information age. Chiu (2005) proposed that library knowledge services, based on document and content resource attributes, should concomitantly factor "disposition," "situation," and "order/scheme" into consideration as additional standards for organizing knowledge resources [11]. Nicholas & Ng (2009) studied virtual teams' attitudes toward sharing knowledge via Web 2.0 approaches and identified positive attitudes toward collaborative learning modes, though beliefs about the true effect of online learning were mixed [12]. Chairatana (2009) introduced the "knowledge, innovation, and service system" (KISS) as an alternative analytical framework including five essential measurement elements: agents, space, scope, practice, and innovation [13].

In summary, these three knowledge service approaches focus on resources, service delivery practice, and outcome assessment systems. How to optimize digital libraries' functions based on the basic theory of knowledge services is indeed an intriguing and thought-provoking issue. It may first appear to be a simple value-added library service idea, but the work is much more complex than initially thought.

2.4 The Lack of "Emotive Element" in Knowledge Services Practice

Published articles about knowledge services in the last three years totaled 1,014 records in the SSCI database (SSCI = topic, keyword, and abstract fields as of December 14, 2009). If keywords contained in those articles represent explicit perceptions about knowledge services, then the social network of those keywords clearly indicates the relationship between main and subordinate concepts of knowledge services.

[Figure 1: see original paper] presents a graphic structure of knowledge services showing the relationship between sub-concepts and their hierarchical relationship to main concepts. An efficient information service system should contain both effectiveness and humanitarianism [14]. A well-executed knowledge/information service should clearly exhibit both technical proficiency and emotive engagement with the task at hand [15].

Figure 1 draws special attention to the fact that knowledge services are concerned only with the effectiveness of managing automated information systems, but not with humane caring or the emotive element of humanity in interactions with people. Knowledge services are meant for human consumption, yet today's conceptualized practice lacks essential emotive elements of humanity, such

as personal feelings, compassion, empathy, satisfaction, sentiment, and holistic perceptiveness.

3 Processes and Procedures of Investigation

The author's investigative study was based on the following premises: Is resource content service good enough to meet user needs? Specifically, is current knowledge service adequate for the information needs of future scholars—postgraduates? It is important to examine current knowledge service practice performed by digital libraries to determine whether they satisfactorily meet information seekers' needs. The ensuing question concerns how information seekers' satisfaction is or is not met and how improvements can be made to achieve more satisfying results for both providers and seekers.

From January 2007 to May 2007, the research project completed a series of surveys: the first examined information user behavior in the Web 2.0 environment; the second studied information seekers' behavior concerning usage and cognition of information; and the third investigated information seekers' and students' perceptions toward libraries and information services across different geographic regions and institutions. These three surveys constituted the preliminary research phase.

As shown in Table 1 , the author surveyed the same samples four additional times during this period. The fourth survey was a basic questionnaire focusing on postgraduate and doctoral students of the Chinese Academy of Sciences in Beijing, using stratified random sampling to systematically investigate twenty types of online information behavior.

The fifth survey employed purposive random sampling to collect responses from both respondents and non-respondents of the fourth questionnaire, adding fifteen closed questions and five open-ended questions about library service innovations. The return proportion showed respondents accounted for 20% and non-respondents 80%.

The sixth survey followed up the fifth questionnaire, also using purposive random sampling to collect handwritten interview data from the same samples, with a 50-50% split between respondents and non-respondents. This survey aimed to understand the reasons and details behind answers from the fourth and fifth questionnaires.

The seventh survey involved natural observation during the six-month period for more detailed understanding of interviewed respondents. These continuous investigations included three in-depth interviews and four email correspondences using a question-answer format.

4 Results

First Survey Finding: More Entertainment Features Than Practical Educational Opportunities in the Web 2.0 Information Environment

Results showed that mobile phones are an important platform for Web 2.0 users. Fifty-five percent of students selected informal methods to obtain desktop software, indicating that free software is more popular than brand-name software. Ninety-one point three percent of students used Instant Messenger for daily communication, and 75% used P2P for entertainment needs. Fifty-one point five percent established personal weblogs to share personal feelings. Some students expected RSS to assist their studies, such as providing academic conference news, but they did not truly understand social bookmarking, though willing to try it. In short, library-created Web 2.0-based services had little effect on students' learning processes or outcomes. Therefore, improvements to digital libraries' knowledge services seemed to lie elsewhere than in advanced information technology environments; in fact, they depend primarily on better understanding users' information-seeking behavior.

Second Survey Finding: The Importance of Informal Communication in Interacting with Information Seekers

Results revealed that most students (91.1%) surf the Internet daily, with two popular methods for accessing academic information: e-journals (35.5%) and search engines (33%). To confirm document reliability, 27.9% relied on common sense or personal knowledge, while 24.6% performed comparative analysis of different documents. When encountering search difficulties, 70.4% opted for more pertinent keywords to continue queries. If unable to access full-text documents, 57.3% stopped searching, 19.3% asked friends for help, and only 8.7% consulted reference librarians. Fifty-two percent used the library building for information retrieval, while 43% obtained desired academic information via search engines. Most disfavored fee-based library services. Thus, informal communication in facilitating knowledge innovation is unexpectedly important in studying users' information-seeking behavior.

Third Survey Finding: Persistence of Stereotypes in Library Information Services Despite Advancements in Digital Library Technologies

The survey found that students across different geographical regions share the same general impressions about bookstores, online bookstores, libraries, and digital libraries: bookstores are for browsing latest books and magazines; online bookstores for purchasing them; libraries for reading newspapers, magazines, books, and journals; and digital libraries for downloading desired articles and seeking relevant topic information.

Fourth Survey Finding: Multifarious Impact of Information Environment on Information Seekers' Behavior

In this survey, the average age bias was 4.358 within the 95% confidence inter-

val, and Cronbach' s Alpha of 0.883 exceeded the 0.5 testing standard. Usage percentages for Email, BBS, Instant Messenger, and P2P exceeded those for Chat-room, Podcast, Social network software, Social Tag, and RSS, with blog usage in the medium range. The main reason for using Instant Messengers was communicating with family and friends; the primary reason for using blogs was discussing entertainment topics or advancing personal popularity, while the least persuasive reason was spreading academic articles, opinions, or ideas. In virtual communities (not "library communities"), library staff may assist users in selecting books, articles, and course materials, but community leaders have stronger influence over professional domains than library staff or reference librarians. Mutual influence among common community members was not remarkable.

Scholar communities were more popular among surveyed students than shopping, entertainment, or chat communities, though a few students showed interest in political communities. Regarding study habits, most surveyed students considered "personalized" service useful or adequate for their information-seeking endeavors. For example, end-users avoided content-listing questionnaires because they included too many non-pertinent details. They would not waste time on lengthy, boring queries without direct perceived benefit.

Therefore, users' information-seeking behavior and needs are multifarious, divergent, and highly individual. Personalized service is a subject-specific content service often not completely suited to individual users' behaviors and needs. Many new channels and approaches for information seeking exist today. Users can employ email (asking friends for help), blogs, remote log-on, and other methods without physically visiting the library. Therefore, libraries must seriously address these emerging competing alternatives and devise new effective ways to cope with this changing information environment, which greatly impacts their professional knowledge service practice.

Fifth Survey Finding: Two-Pronged User Expectations for Value-Added Information Service and Problem-Solving Programs

Chi-square analysis, Pearson correlation coefficient tests, and contingency tables showed no significant correlation for most variables, but revealed two obvious correlations: between "digital library support for experimental data" and "digital library for document download," and between "digital library support for experimental data"and "digital library for problem-solving programs,"with Pearson coefficients of 0.539 and 0.554 respectively (greater than 0.5 but less than 0.1 correlation coefficient tests). Thus, users visit digital libraries with stronger motives for using bibliographic information services. They expect library knowledge services practice to include intelligence analysis and communication service with collaborative communities, with the process factoring mutual interests of information seekers and reference librarians.

Sixth Survey Finding: Creating Persona Profiles to Record Users' Online Search Behavior, Responses, Workflows, and Search Objectives

Results showed that informal communication through digitalization, social networking, group interactions, and other means impacts user behavior. Additionally, instant transmission of academic information has begun appearing in many new forms. These emerging mediums have gradually become accustomed and even indispensable tools for information gathering and dissemination among the younger generation of scientists, engineers, researchers, educators, and scholars who are technologically savvy. Based on sustained tracking from the fourth survey, we established four fictional character types (Personas): (1) information users fond of experimenting with new technologies; (2) information seekers with biased perseverance in using search engines rather than other tools; (3) information users preferring communication via networked virtual communities online; and (4) information users who access documents, articles, books, and databases only by being physically present in a library building.

It is important to develop a good interaction protocol between users and library staff based on personas and their mental activity models. For example, using BBS, Blogs, and Email for library-end-user communication is plausible for avoiding situations where users ignore suitable library knowledge services because transmitted messages are too boring or uninteresting.

Seventh Survey Finding: Using Persona Profile Construction to Support Emotive Communication Demands

The survey found that information users could be juxtaposed into 16 prototypical categories stemming from combinations of items across four psychological factors (tracking, integration, extraction, exploration) and four social element categories (teachers, students, institutions, corporations). However, after further tracking and observation of eight students' information-seeking behavior, we concluded there were four typical categories of information users, each with major different concerns about getting needed knowledge services: "a timely helping hand pointing me in the right direction and a sound strategy for my research work," "discussing with me what other people are doing besides academic research activities," "sharing real-world experience with me," and similar issues. The main finding is that libraries can draw mental maps about their reader clientele to improve knowledge services with greater focus on an emotive modus operandi.

5 Discussion

From the investigative study and analysis, we found that informal communication provides unique features, including advanced discovering opportunities for information gathering and feedback mechanisms, and distinctive characteristics based on value-orientation toward information providers' emotive engagement rather than on information resources' wealth and strength. Knowledge service aims to support not only access to and understanding of intellectual content from selected library resources, but also end-users' self-directed educational abilities in their lifelong learning pursuits. Examining knowledge services practice

across various libraries revealed two major interrelated service dimensions in rendering effective responses to information inquiries. From knowledge service professionals' (or reference librarians') perspective, they must meet end-users' information needs through routine procedures: providing initial information-finding sessions, performing follow-up actions after confirming inquiries, and concluding tasks with information delivery and possibly user-satisfaction questionnaires. From information seekers' perspective, end-users need emotive touch just as much, if not more, than information assistance from library professionals in their daily learning pursuits. An emotive touch by library and information professionals will go far in satisfactorily meeting their clientele' s information needs.

Based on this premise, the author fully developed a model of emotive practice for knowledge services, focusing on establishing mutual understanding and trust between library professionals and end-user clientele. The operational aspect involves four steps: (1) understanding users' personal backgrounds, information-seeking behaviors, and needs; (2) making knowledge services known to potential users; (3) showing mutual respect and appreciation; and (4) establishing personal friendship between service providers and end-users.

At the first step, information providers should adopt informal communication as a basic framework to observe, analyze, and compare all online users' personal profiles, focusing particularly on differences in age, gender, language skills, cultural leanings, subject interests, viewpoints, and perspectives. Creating online user profiles benefits library practitioners by enabling better understanding of the change and persistence in users' information-seeking behaviors in a categorized manner, optimizing knowledge services performance differentiation. User profiles also allow libraries to prioritize knowledge services with sound rationale within institutional constraints of limited material and personnel resources.

The second step requires information service practitioners to engage in emotive communication with end-users. The substance depends on data analysis results accounting for end-users' language skills, mental inclinations, and thought-forming paths in given subject fields. The concern is not service modernization embodied in terms associated with instrumental rationalism such as "paradigm," "paradigm shift," "user-driven," "intelligent-driven," or "knowledge-driven," which have nothing to do with humane caring and compassion. Rather, the ultimate concern rests on the emotive touch element in performing knowledge services, cultivating mutual confidence and trust between practitioners and information seekers. Developing such social and interpersonal networks is made possible through analysis of established personnel profiles and end-user feedback from those receiving library knowledge services.

The third step involves understanding individual end-users' information-seeking behaviors and essential background information, including native origin, language skills, age, gender, cultural learnings, and preferences for daily activities such as frequented places, common activities, conversational topics, and time-management patterns for work and leisure. Knowledge services provided by li-

brary practitioners must be custom-tailored to library users' information-seeking behaviors.

The final step requires library practitioners to change condescending teaching or supporting manners into an "emotive engagement of intellectual dialogue" modus operandi, centered on friendly, informal sessions of social caring juxtaposed with mutual thought-provoking and knowledge sharing. In other words, the emotive element is both a prerequisite for and central to knowledge services, and ought to be vividly exhibited throughout library practitioners' professional lives.

Additionally, knowledge services should not be limited to monolithic delivery methods. Intellectual content delivered to information seekers may be packaged in non-traditional physical formats such as comic books, cartoons, video clips, games, posters, brochures, and online information resources retrieved from cyberspace to attract end-users' interest and attention.

6 Conclusion

This study was prompted by the author' s initial puzzlement over a conceptual map resulting from analysis of knowledge services articles using social network software, which failed to show "emotive element" in its graphic presentation. The study subsequently researched the role of informal information communication and its relationship to end-users' information-seeking behavior. This empirical study concludes that students at the Graduate School of the Chinese Academy of Sciences believe professional library practice should seriously consider the value and desirability of informal communication and emotiveness-driven knowledge services. Such services should emphasize emotive sentiment display rather than merely event processing. This paper recommends developing an emotiveness-driven mechanism for libraries' knowledge service practice to optimize functional effectiveness.

While adding an emotive element to knowledge services may not directly lead to knowledge innovation, it can nonetheless heighten end-users' interest in studying research topics and deepen their devotion to knowledge exploration and/or discovery. It is important for librarians to transmit, in high profile, the notion to information seekers that they now have a most supportive and caring "friend" in their digital library.

Emotiveness-driven knowledge services provided by libraries necessarily rely on highly qualified staff teams to carry them out step by step. This is a labor-intensive proposition that may incur additional financial burden on library operational budgets. However, costs can be somewhat ameliorated with assistance from more pertinent computer programs in the Web-based information environment. The author' s future research will focus on balanced application of these computer-assisted devices and analytical study of differences and similarities in information-seeking behavior as reflected in weblogs compared to social science research instruments. Additionally, cost-effectiveness and work efficiency issues related to the proposed emotiveness-motivated informal communication modus

operandi for libraries' knowledge services, and comparative analysis of similar practices in other service-oriented industries, require further exploration.

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Note: Figure translations are in progress. See original paper for figures.