Reflections on In-depth Knowledge Services of University Libraries in the Knowledge Economy Environment

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Abstract

This paper expounds upon the value positioning, essential connotation, and significance for the transformation of university libraries of knowledge services within the new information and knowledge environment. It analyzes the fundamental distinction between knowledge services and ubiquitous subject services from the perspective of university libraries, as well as the cognitive, theoretical, and practical barriers that must be overcome for university libraries to more deeply develop knowledge services. It proposes that knowledge products represent an important form of knowledge service, and that the quality of knowledge products directly reflects the core value and capability of the library. Furthermore, this paper provides relatively clear and systematic explanations and descriptions of the concept, attributes, types, and production principles of knowledge products from a theoretical perspective.

Full Text

Reflections on Deepening Knowledge Services in University Libraries Under the Knowledge Economy Environment

Abstract

This paper expounds on the value positioning and essential connotation of knowledge services within the new information and knowledge environment, and its significance for the transformation of university libraries. It analyzes the fundamental distinctions between knowledge services and ubiquitous subject services from the perspective of university libraries, as well as the barriers that must be overcome in cognition, theory, and practice to implement knowledge services more deeply. The paper proposes that knowledge products represent an

important form of knowledge service, and that the quality of knowledge products directly reflects the core value and capability of libraries. Furthermore, this article provides a relatively clear and systematic theoretical explanation and description of the concept, attributes, types, and production principles of knowledge products.

Keywords: Research Libraries; Knowledge Product Production; Knowledge Service Capability

1.1 Characteristics of the Current Knowledge Environment

The macro-level social information environment demonstrates that the 21st century is a society where information and knowledge serve as crucial productivity factors. Rapidly developing information technologies and increasingly abundant information resources have completely departed from traditional information environments for libraries. Two prominent features—the diversification of information forms and the openness of information dissemination—have shattered the "indispensability" of much information, accelerating the "disintermediation" of information acquisition and interaction. Particularly, the difficult negotiations between the global academic library community and database vendors have continuously advanced the degree of open access (OA) to academic journal articles. Consequently, knowledge innovation groups' dependence on libraries has gradually weakened, posing severe challenges to the functional positioning and core values of traditional libraries. The trend in library work, both now and in the foreseeable future, involves elevating service content from information-centric to knowledge-centric, and shifting service forms from information consultation to knowledge innovation. The core value of libraries is directly manifested in knowledge service capabilities built upon the acquisition, correlation, mining, analysis, and utilization of knowledge.

1.2 The Rise of Knowledge Services and Their Social Impact

Knowledge Service, which takes knowledge products as its service content, emerged in the 1960s against the backdrop of the rising knowledge economy and knowledge management. Peter Drucker, the father of management studies, once pointed out that "the knowledge society means that the performance of individuals, organizations, industries, and nations in acquiring and applying knowledge will increasingly become a key competitive factor" [1]. Therefore, the earliest knowledge services took the form of knowledge management, popular in knowledge-intensive service industries such as law, consulting, information, and finance to improve work efficiency and elevate industry standards. The field of library and information science possesses both knowledge-intensive and service elements, and knowledge services have become a concern in this field since the 1980s. In 1997, Chinese scholar Wang Xiaomei first introduced this concept to the domestic library community, proposing that "libraries are important places

for providing knowledge services" and that "the development trend of libraries is to attach greater importance to and give full play to knowledge creation functions than ever before" [2]. In 1999, Mr. Ren Junwei pointed out that in the new knowledge-based economic society, knowledge has become a form of capital, and economic growth directly depends on investment in knowledge. The knowledge services provided by libraries will play an important role in all basic links of the knowledge economy, and the function of libraries is for the purpose of knowledge production and reproduction [3]. In 2001, Jiang Yongchang specifically discussed the differences between knowledge services and information services [4].

In 2000, Zhang Xiaolin provided a more explicit interpretation of knowledge services from the perspective of library functions. He argued that knowledge service is based on the knowledge and capability of searching, organizing, analyzing, and reorganizing information and knowledge, and according to users' problems and contexts, it integrates into the process of users' problem-solving to provide services that can effectively support knowledge application and knowledge innovation [5]. This interpretation comprehensively renewed the service philosophy of domestic research institutes and university library and information institutions, and was widely accepted by global colleagues, opening a new stage of theoretical and practical research on non-commercial knowledge services for knowledge innovation-intensive groups.

1.3 Knowledge Services and the Third Functional Transformation of Libraries

In the development of libraries over the past half-century, their functional evolution has undergone three stages: literature collection and organization, information consultation and service, and knowledge organization and service, marking three capability levels of library service. Before the 1970s was the first stage, where library work objects were primarily print literature, and work modes were relatively closed. In the later period of this stage, information resource forms became diversified. With the advent of the digital library era and the emergence of subject librarians as a new role, libraries entered the second stage, shifting their focus from resource collection to literature acquisition, from resource description to literature delivery, and from resource management to consultation services, though the main body of service content remained information. The beginning of this century marked the entry into the third stage—the knowledge service stage—as shown in Table 1 .

Table 1. Three Stages of Library Functions

Period	Work Focus	Role	Service Content	Service Driver	Capability Emphasis
Pre-1970s	Acquisition, Cataloging	Literature Collection & Organization	Paper Literature	Collection Self-construction	Resource Coverage
1970s–Late 20th Century	Digital Resource Construction, Information Retrieval	Information Management, Push & Consultation	Digital Resources, Professional Databases	User Group-driven Demand for Professional Information Access	Technical Support
21st Century–	Knowledge Organization & Reproduction	Knowledge Management, Mining & Delivery	Knowledge Bases, Special Collections, Thematic Knowledge Packages (packages)	Special User-driven Demand for Highly Integrated Specific Knowledge	Knowledge Output

In the knowledge service stage, the positioning, level, methods, and object/value of library services have all changed [6]. Although providing literature services remains an important task for libraries, the core problem that needs to be addressed is the relative abundance of information resources versus the insufficient supply of intelligence. In this stage, the roles libraries undertake, the objects of their work, and their evaluation standards all consciously shift to a knowledge-centered, librarian knowledge innovation capability-centered, and practical problem-solving-centered orientation, as shown in Figure 1 [Figure 1: see original paper]. The focus of library work needs to move away from storing, managing, and revealing large amounts of loosely logically related information resources, and instead concentrate on knowledge organization, mining, integration, and delivery of high-quality, high-density knowledge packages to directly

meet specific needs or decision-making. Knowledge services represent an advanced stage promoted by the rapid development of the knowledge economy, information technology, and the knowledge ecological environment.

2.1 Insufficient Understanding of the Innovation and Value-Added Nature of Knowledge Service Content

It is widely acknowledged that knowledge services represent the development trend for university libraries; however, neglecting the essence of knowledge services will inevitably compromise their effectiveness. Accurately understanding the connotation of knowledge services is essentially like establishing a coordinate system for the practice, theoretical research, and evaluation of knowledge services, which is key to enhancing library knowledge services.

The content of knowledge services can be divided into broad and narrow senses [7]. In the broad sense, knowledge services are services that take knowledge as their content. Knowledge and information are fundamentally different. Information is an attribute of things, an objective reflection of them, manifested through messages, instructions, data, symbols, and other means to represent the motion or change states of things themselves and the relationships and interactions between things. People distinguish different things by acquiring and identifying different information from nature and society. Information has the characteristics of being fragmented, rough, superficial, and existing independently of human cognition. Knowledge, however, is a special kind of information that people have cognized and processed from information in the objective world. Knowledge is more systematic, dense, stable, inheritable, and subjective. In the narrow sense, knowledge services place greater emphasis on the subjective mining and secondary innovation of the value of knowledge itself. They are based on the knowledge and capability of collecting, screening, researching, analyzing, and reorganizing various explicit and implicit information or knowledge elements, seeking to maximize the utilization of knowledge.

2.2 Ambiguous Theoretical Distinction Between Subject Services and Knowledge Services

Vague delineation between subject services and knowledge services will cause knowledge services to lose direction. In the late 20th century, the new role of subject librarians emerged in academic libraries, promoting the shift of library work from resource guarantee services to subject consultation services. Moreover, within just a dozen years, the ubiquity of subject services has continuously increased, with service forms related to subjects constantly emerging. Alongside the strengthening of the "knowledge service"concept, the knowledge connotation in services has gradually improved.

However, when facing today' s rapidly developing information and economic environments, we still feel deeply uneasy. We wonder whether library knowledge services have truly adapted to changes in the knowledge ecological environment.

In fact, university libraries have tremendous room for improvement in the efficiency of knowledge resource utilization and in the secondary appreciation of knowledge. The author believes this situation arises from the long-standing unclear conceptual distinction between "subject services" and "knowledge services" in the industry. Extensive literature research reveals that the concepts of "subject knowledge service" and "knowledge service for subjects" have always been collectively referred to as "subject knowledge service." Subject services indeed require high-level professional knowledge, but are these two concepts truly the same? Lu Xiaobin explicitly pointed out: "Without value-added and innovation, it is not knowledge service" [8]. In this sense, the content of subject services should be broader, allowing for the inclusion of parts without innovative value-added. In other words, resources utilized in subject services can be information resources or original knowledge elements from collections. However, the service content in "knowledge service for subjects" must emphasize that it has undergone secondary processing by librarians or artificial intelligence during the library' s knowledge management process, and is an integrated product of high-density knowledge elements with certain innovative value. Therefore, "subject knowledge service" belongs to the broad definition category of knowledge services, while "knowledge service for subjects" is what the narrow definition of knowledge services aims to achieve.

To break through the barriers of library subject services and achieve true library knowledge services, we must adhere to the narrow interpretation of knowledge services, commit to enhancing the knowledge regeneration value of knowledge service content, and guard against mistakenly taking subject services as knowledge services amid the increasing ubiquity of subject services today, which would cause knowledge services to lose their proper value orientation and affect the transformation process of a research library.

2.3 Knowledge Service Capabilities Lacking Sustainability in Practice

The current trend in the library profession is service based on research and research based on service [8]. Insufficient knowledge innovation capability is also an important related factor in the lack of innovation in library knowledge services. At the 2015 Library Management and Innovation Forum, Wang Xin proposed that "a research library should become the goal pursuit of 985 university libraries" [9]. A research-oriented university library serves a knowledge innovation group with high knowledge density. Services for this group are completely different from knowledge popularization-level services that primarily meet the daily needs of general learning, work, and life; instead, they must aim to meet the needs of first-class academic development and high-standard education. The level of this service directly relates to discipline construction and academic development. Therefore, the modern university library' s knowledge transformation also requires the synchronous transformation of librarians' roles, shifting from a pure service identity that provides information support for knowledge inno-

vation groups to a dual identity that undertakes and participates in knowledge innovation itself. Consequently, the demand for individual librarians' research capabilities represents the most severe challenge in history. For a research library, the importance and urgency of constructing and long-term planning the overall knowledge service capabilities of librarians are becoming increasingly prominent.

As Professor Chu Jingli recently pointed out, "The fundamental problem of library development is a capability problem" [10]. The transformation needs of libraries have strongly called for an update in university libraries' self-positioning cognition, and knowledge innovation capability has become the standard for evaluating new value manifestation in libraries. The present is an era of "intelligence leading the future," and knowledge innovation capability is the core competitiveness of research libraries. If information resources, technology platforms, and librarians' knowledge service capabilities constitute the three core resources of libraries, then librarians' capabilities in information collection, analysis, and processing, their ability to master and output knowledge, and their capacity for scientific research constitute the most important soft power among library capability resources. The level of knowledge services provided by these librarians directly reflects the value of modern libraries, and knowledge products in knowledge services are the window to libraries' hard and soft power.

Furthermore, while consciously strengthening talent reserves, we must also continuously improve talent management mechanisms [11], encouraging librarians' intellectual contributions and promoting craftsmanship in the profession, enabling capable librarians to concentrate on mining and organizing resources at hand, diligently producing more systematic and complete knowledge products with value-added content, enhancing the knowledge connotation of service content, and accelerating the pace of library knowledge services.

2.4 Insufficient Theoretical Support for Knowledge Services

The marginalization of the library industry has become the driving force for library transformation. However, library transformation is a systematic issue. Throughout the entire process from concept to practice, from practice to theory, and from theory back to practice, the work center continuously shifts, ultimately focusing on the most essential issue: pursuing the maximized inheritance of social knowledge. From this perspective, although knowledge service is a very complex proposition with some theoretical definitions still unclear, there is no doubt that knowledge products are one of the important forms of library knowledge services. Starting from knowledge products can make knowledge services more concrete and operable. In other words, using knowledge products as a breakthrough to enhance the knowledge connotation of library services, using knowledge products as a lever to drive library transformation, and making knowledge products the 抓手 (handle) for library knowledge services is a strategy, as shown in Figure 2 [Figure 2: see original paper]. Regrettably, theoretical research on the forms, attributes, and models of knowledge products from the

perspective of library knowledge services is still very rare. Among 1,024 documents found through keyword, title, and subject searches for "knowledge product model," "knowledge product form," and "knowledge product service," only 84 are related to library and information science, of which 10 involve knowledge production and reproduction, showing a lack of sufficient theoretical generalization on the models, forms, and services of knowledge products. This indicates a scarcity of theoretical guidance for the practice of knowledge product services in university libraries.

3.1 The Emergence of New Species in the Knowledge Economy Society

The information environment has submerged people in an ocean of information. The ability to rapidly extract valuable, precise, and needed knowledge from massive amounts of information is both a necessary survival skill for everyone and a new functional requirement for libraries. The impact of the knowledge economy on information services is the direct cause for the emergence of knowledge service products [12]. The information environment, information technology, and commodity economy have collectively pushed knowledge into the marketplace, giving rise to a new batch of knowledge service products designed to alleviate people' s desire for knowledge and selection pressure. The "Dedao" app, founded in 2015 and currently having 30 million users, is an example of this new species of knowledge service product. Such products align with the pace and taste of modern knowledge seekers and are deeply loved by the public at different levels. The successful emergence of various knowledge products with commercial labels has opened a new era for the internet, moving from free information to paid knowledge [13], marking a leap in the quality of knowledge products for knowledge service purposes and in production methods. The commercial model of knowledge products will continue to mature and prosper. This new species not only broadens our initial boundaries of the knowledge service industry and updates our initial understanding of the knowledge economy, but also makes us strongly feel that in today' s society, knowledge is not only a form of capital but also a commodity with tremendous power to generate direct economic benefits. Simultaneously, it intensifies the challenge to library knowledge services.

3.2.1 The Ecological Environment of Knowledge Products

Knowledge products (knowledge packages) are new knowledge achievements produced by leveraging existing information and knowledge resources, presenting their maximum economic and social value through knowledge marketing and knowledge sharing. Knowledge products emphasize knowledge rather than information, and emphasize the integration of logical relationships rather than fragmented element accumulation. The so-called new knowledge achievements here refer not merely to differences in product form, but to whether intellectual labor has been incorporated and whether value-added has been generated during the processing of original information and knowledge elements. The

value-added to original knowledge elements during the production process of knowledge products is realized during their use. The dissemination methods of knowledge products mainly include market transactions, customized delivery, educational dissemination, and promotional media. Through the production and dissemination of knowledge products, society' s ability and efficiency in utilizing knowledge are improved. The production methods, dissemination channels, and product forms of knowledge products constitute the basic ecology of knowledge products.

3.2.2 Classification and Forms of Knowledge Products

Knowledge service products are product forms professionally organized to meet users' specific knowledge needs and thereby obtain certain commercial value [14]. According to the definition of knowledge products in the narrow sense of knowledge services, the non-commercial knowledge product forms currently emerging in the university library community can be summarized into three categories: consultation, intelligence, and knowledge, as shown in Table 2 .

Table 2. Forms of Knowledge Products in University Libraries

Category	Product Form	Knowledge Density	Personalization Degree	Knowledge Value-Added (Intellectual Input)
Consultation	Project Proposal, Sci-tech Novelty Search Reports, Evaluation Reports	Low	High	Professional Perspective
Intelligence	Subject Dynamics Analysis, Research Project Tracking, Domain Monitoring Bulletins	Medium	Medium	Research Support

Category	Product Form	Knowledge Density	Personalization Degree	Knowledge Value-Added (Intellectual Input)
Knowledge	Thematic Knowledge Packaging, Academic Topic Packaging, Professional Knowledge Bases, Special Collections, Subject Portal Modules, APP Knowledge Learning Platforms	High	Low	Systematic Integration

3.2.3 Attribute Characteristics of Knowledge Products

1) They are collections of multiple knowledge elements with high generality and knowledge density;
2) The carrier forms of knowledge content are diverse;
3) Knowledge elements within knowledge products have strong correlation or logical relationships;
4) They have independent positions within the knowledge system of specific disciplines;
5) They have deliverability and can be shared within certain scopes;
6) They have non-wearability and can be reused.

Figure 3 [Figure 3: see original paper] illustrates the properties and character-

istics of knowledge products in university libraries.

3.2.4 Principles of Knowledge Product Production

The production process of knowledge products, which involves mining, analyzing, screening, correlating, reorganizing, and packaging information or knowledge elements, requires adherence to the following main principles, as shown in Figure 4 [Figure 4: see original paper]:

1) **Purposefulness**
The primary purpose of knowledge products is to reduce users' selection pressure from massive original information resources, improve knowledge acquisition efficiency, increase the utilization rate of original information resources, and reduce resource procurement costs. Therefore, before producing each knowledge product, clear objectives must be established based on the special purpose of the activity or users' personalized needs, determining the screening criteria for knowledge factors, organizational logic, and the revelation form of knowledge products.

2) **Value-Added Nature**
The value-added service and innovation of knowledge products are reflected in three aspects: time efficiency value-added, content quality value-added, and knowledge management value-added. Screening and integration improve readers' retrieval efficiency for relevant information, adding value to the satisfaction of rapidly obtaining resources, which can be accomplished by humans and intelligent search engines. Mining, selecting, and reorganizing original information improves the knowledge density and logic of scattered resources, assisting users in efficiently understanding and grasping key points of specific thematic knowledge, adding value to the satisfaction of accurately obtaining knowledge, which requires intellectual labor from librarians with strong professional knowledge. The management and promotion of knowledge products improve the refined management of library resources, allowing for sharing, common awareness, and reuse within a reasonable scope. These three aspects represent not only the proliferation of knowledge production and reproduction but also the embodiment of the library' s overall strength.

3) **Scientific Nature**
The production of knowledge products is undoubtedly a condensation process of artificial intellectual labor, highly dependent on librarians' depth of understanding of professional fields, their own knowledge structure, and intellectual processing by the brain. Any partiality or subjective bias by librarians in knowledge fields may cause content bias or academic flaws in products. Therefore, the principle of scientific nature must be followed in the secondary processing of knowledge factors. First, in content construction, the essence and system of knowledge must be respected, meaning that in the collection, analysis, and screening of product content, attention

must be paid to the scientific nature, logic, generality, and completeness of the knowledge ontology. Second, in the product organization process, scientific methodology must be followed, using scientific methods to guide the entire process of research, refinement, and processing of knowledge objects.

Knowledge service is a proposition. At the 88th annual conference of the American Special Libraries Association in 1997, Bill Gates stated: "Libraries store important information resources, and they will play an unprecedented central role in the information age because timely and useful information is a key factor in competitive success. The responsibility of librarians is to help people select information, evaluate information, and connect with information networks" [15]. Another 20 years have passed, and what has rapidly developed and changed in society is not just the information environment, but the arrival of a society with an even more prosperous knowledge economy triggered by it. In this society, knowledge value will be infinitely manifested. For university libraries to continue developing rooted in the ecology of knowledge innovation groups, their role repositioning should undoubtedly focus on providing innovative knowledge services, enabling them to become capable knowledge managers and inheritors who provide secondary regeneration value of knowledge between knowledge producers and users in the open information environment and knowledge economy society. Only by maximizing the manifestation of knowledge value in society and on university campuses can libraries realize their own value of the era.

The quality of knowledge products is the core embodiment of research library librarians' service capabilities and professional library value. The theoretical interpretation of knowledge products has just begun, as shown in Figure 3, and the exploration of practical models for knowledge services is still in its initial stages. However, we can undoubtedly take knowledge products as a focal point for the transformation of research-oriented university libraries, because a research library must have innovative knowledge output, and a university library should take the research library as its long-term pursuit goal.

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