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Embedded Library Research Support Service: A Knowledge Management Service Framework in Academic Libraries

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Abstract:

Academic libraries are facing challenges of how to effectively engage in academic communities and better support and facilitate new paradigms of teaching, learning and research. Academic libraries shift their service model from information-centered to knowledge-centered services in order to be adapted to the challenged environment. This article proposes an embedded library research support service model based on knowledge management and explains how elements and process of the framework function through a case study in which knowledge management services were delivered by a subject librarian of Xiamen University. The new service model, called embedded service model, is based on a theoretical assumption that library services could be defined as the process of building a community of practice, in which group members, including librarians and researchers, are tied by common interests in a domain. In this model, librarians engage in knowledge sharing within the community and play special roles in knowledge acquisition, organization, sharing, creation and application. This article concludes that knowledge management provides an effective and concrete foundation for librarian to establish relationships among users, technologies and resources in the context of research community.

Keywords: Knowledge Management, Library Research Support Services, Case Studies

Introduction

The emergence of digital technology makes fundamental changes to learning, teaching and research in universities. Students and researchers are overwhelmed with exponential growth of research-based information. How to critically distil deep conceptual knowledge from massive increase of information significantly reshapes the paradigm of knowledge creation, dissemination in academic communities. Academic libraries are changing in a changing environment of scholarly publishing, information delivery models, and technologies as well. They are facing great challenges in such a changing environment. The key challenge is how academic libraries can effectively engage in this new academic community and better support and facilitate new paradigms of learning, teaching, and research. It is evident that librarians can no longer meet the information needs of the university community through the traditional avenue of simply adding to their library collections. This challenge requires academic libraries shift their service model from information-centered to knowledge-centered services. Librarians should extend their information management roles and enhance their knowledge management competencies. This article aims to design a framework through which librarians could deliver services to patrons in the new era, and the service framework is based on knowledge management (KM).

Definition and Applications of KM in Academic Libraries

Knowledge management was first used by Carl Wiig in 1986 at a Swiss conference sponsored by the United Nations—International Labor Organization. Today KM is being widely practiced in various disciplines, and there is a lack of consensus on KM definition. However, managing and leveraging organizational knowledge to improve organization's performance is the common theme all definitions are emphasizing.

The concept of knowledge management draws much attention in library community. IFLA defined KM as “a process of creating (generating, capturing), storing (preserving, organizing, integrating), sharing (communicating), applying (implementing), and reusing (transforming) organizational knowledge to enable an organization to achieve its goals and objectives” (as cited in Ali & Khan, 2015). IFLA further clarifies that “the term knowledge is not limited to published information; it also covers tacit knowledge (expertise), implicit knowledge, explicit knowledge, and procedural knowledge” (as cited in Nazim Mohammad, & Mukherjee Bhaskar, 2016, p.53).

Academic libraries contain vast amounts of organizational knowledge about their users, processes, products and services, as well as knowledge of their employees as key knowledge assets. The aim of KM in academic libraries is to effectively utilize the available knowledge resources to help librarians to manage their tasks efficiently and effectively. In general speaking, KM is the process of community building by connecting people via knowledge capturing, distilling, reusing and creation. For academic library services, the community building focuses on providing opportunities and knowledge for students and researchers to engage in academic community by collecting, processing, utilizing, disseminating, storing and sharing community knowledge.

There are two main streamed opinions in this research area. One is focusing on KM implementation in libraries, with discussions focusing on creating, sharing, using and managing organizational knowledge in libraries. Mohammad Nazim and Bhaskar Mukherjee (2016) examined the functions of different approaches for effectively managing organizational knowledge (both explicit and tacit knowledge in libraries), which are “intellectual capital approach, techno-centric approach, human-centric approach, knowledge

creation and conversion approach, codification approach, personalization approach” and etc. Mohammad and Bhaskar argued that libraries should devise and implement a hybrid KM approach for balancing.

The other streamed opinion which is more relevant to this article, is centered on conducting knowledge management services. Hwa-Wei Lee (2005) emphasized that “the utmost goal of knowledge management is to provide users with a variety of quality services in order to improve the communication, use and creation of knowledge.” Parker, Nitse, and Flowers (2005) proposed providing both knowledge management and competitive intelligence services for small business to enhance libraries as knowledge management centers, and the proposed services were targeted to the small business. They considered that by offering knowledge management services, libraries could be able to provide a vital resource for business community and ensure the continued viability of libraries in a changing environment. As members of academic community, research groups in universities also face the same challenges. Sometimes, they are not able to collect sufficient internal and external knowledge to assist their own research. Delivering KM services to research groups is a solution to fill the library service gap. Bem, Coelho, & Dandolini (2016) proposed a three-module KM framework for university libraries to design and deliver KM services, which are knowledge management coordination, knowledge resources, and learning commons. Townley (2001) opined that librarians can use knowledge management as one way to expand the library’s role to areas where libraries had little impact in the past, in particular, supporting services. Townley further discussed the four types of KM processes, including creating knowledge repositories, improving knowledge access, enhancing the knowledge environment, and managing knowledge as an asset. Above all, KM has been widely discussed in library community since the last two decades. However, there is still a relative lack of case studies on library KM services. This article aims to discuss KM service framework through a KM based library service practice that was embedded into specific research project.

Knowledge Management Service Framework

Service Elements

This article proposes an embedded library research support service model, in which library services are embedded through the whole research lifecycle. New service model is based on a theoretical assumption that library services could be defined as the process of building a community of practice. A community of practice refers to a group of people “who share a concern or a passion for something they do and learn how to do it better as they interact regularly.” Etienne (2015) particularly pointed out that there were three crucial characteristics about a community of practice:

- 1) The domain, a community of practice has a shared domain of interest;
- 2) The community, every member in a community of practice engages in joint activities and knowledge sharing;
- 3) The practice, every member in a community of practice develops a shared repertoire of resources, including knowledge, resources, and tools.

For the library, members in a community of practice consist of librarians and researchers (patrons). The community is tied by common interests in a domain. They pursue for solutions on the same research topic. Librarians and researchers engage in a joint information seeking activities and they share common resources and tools. Therefore, a library service is

composed of five elements, which are shown in Fig. 1: research topics, researchers, librarians, resources and tools. In knowledge management perspective, a library service is a process of managing knowledge in this community, which means a library service is KM process of above five elements.

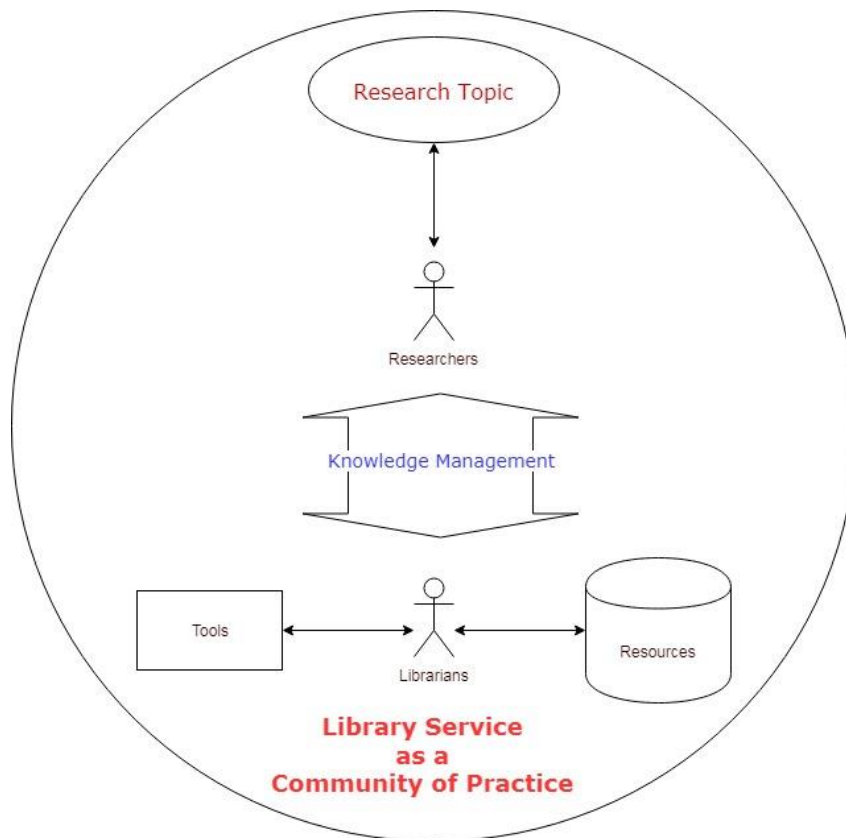


Fig. 1 Elements of a KM-Oriented Library Service

The goal of the embedded library service is to manage the knowledge of the community through a systematically process for acquiring, organizing, applying, sharing and updating as well as recording community members' knowledge about resources and tools.

Service Process

The process of a KM-oriented library service includes the following five steps and is shown in Fig. 2 and Tab. 1:

1) Knowledge acquisition

Knowledge acquisition usually sits in the heart of library KM services. It is the process to obtain knowledge from internal and external sources. In this process, it is very important to ensure the following four types of knowledge are successfully acquired:

i) Knowledge about research topic

The embedded library service intends to facilitate research and teaching projects. The knowledge about research topic obviously plays the key role in a research driven library KM service.

ii) Knowledge about researchers

In particular, information or knowledge needs of researchers are important which may help librarians to figure out which may be useful. The knowledge about relevant research community is also crucial for building more efficient academic cooperation network.

iii) Knowledge about resources related to the research topic

The resources include the resources in the library and external resources, such as library collections, databases, websites, and so on

iv) Knowledge about tools available for searching, collecting and processing information for research

The methods of knowledge acquiring include but not limit to interview, meeting, literature investigation and review, searching and testing. Knowledge acquiring often requires a combination of multiple approaches and data sources.

2) Knowledge organization

Knowledge organization is the process to classify, describe, index, store acquired knowledge. Many traditional information organization technologies and skills could be adapted to organize community knowledge as well. The purpose of knowledge organization is for navigation and retrieval. The knowledge organization also includes assessment and evaluation process that is to make sure the relevance, accuracy and completeness of the acquired knowledge.

3) Knowledge sharing

Knowledge sharing is the process to deliver right knowledge to the right people at right time. It makes community knowledge available to the members of research project who need. The knowledge can be shared by training, meeting, presentation and personal consultation.

4) Knowledge creation

Knowledge creation refers to create community knowledge by developing guidelines, manual, resources guides, catalog and so on. One of the vital knowledge creation tasks is to convert tacit knowledge to explicit knowledge by documentation and recording personal experiences.

5) Knowledge application

Knowledge application is the process to apply knowledge in action to accomplish the goal of services. The typical actions include collection development, document delivery and other library services.

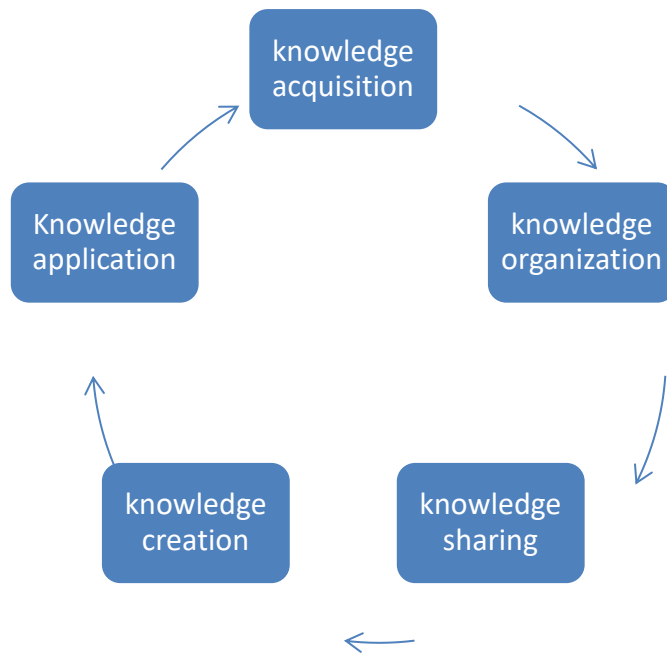


Fig. 2 Lifecycle of Knowledge Management

Tab. 1 Service Process

Process	Objects	Methods
Knowledge acquisition	<ul style="list-style-type: none"> • Research topic; • Researchers; • Relevant resources; • Available tools 	<ul style="list-style-type: none"> • Interview • Meeting • Literature investigation and review • Searching, and Testing
Knowledge organization	Acquired knowledge	<ul style="list-style-type: none"> • Identify • Classify • Describe • Index • Store
Knowledge sharing	Acquired knowledge Community members	<ul style="list-style-type: none"> • Training • Meeting • Presentation • Personal consultation
Knowledge creation	Acquired knowledge	<ul style="list-style-type: none"> • Guidelines • Manual • Resources guides • Catalog • Knowledge base/mapping • FQA
Knowledge application	Acquired knowledge	All actions

Case Study of a KM based Library Service Practice

Over the last decade, the presence of micro-plastics on marine environments has become research front and hot topic in social and scientific community. Minggang Cai, a professor of marine science in Xiamen University of China, focuses on investigating the fate of pollutants, and anthropogenic tracers for oceanic processes in the high-latitude area (especially the Arctic). The pollutants include anthropogenic chemicals (like persistent organic pollutants, POPs), metals and micro-plastics. Currently, he works on the dynamics of POPs in the Arctic air-water-sediment system, and tries to build the mass balance model, under the influence of climate changing.

A subject librarian, Juan Chen, joined professor Cai's research project to provide embedded research support services. Fig. 3 shows five elements in this KM-oriented library service practice.

In the step of knowledge acquisition, the subject librarian gave a priority to acquire knowledge about the research topic by a literature investigation. She interviewed and met with Prof. Cai's research group several times, discussed, tested, and finally confirmed the query strategy to avoid sample bias resulting from inappropriate retrieval terms or conditions. She provided research group an integrated view of the research trends by scientometric method and assists research group in identifying current research trends about micro-plastics pollution in sediment, beach, biology and seawater.

In knowledge organization period, the subject librarian helped to identify research objects relevant to the research project, such as institutions, authors, institutions, funding, and keywords. Working together with the research group, she also needed to further classify clusters through statistical methods, described what each cluster meant and how efficient that classifying method was.

Both subject librarian and research group played an active role in knowledge sharing process. Juan shared her expertise on the tools she used with PhD students in the research group by providing training courses. Professor Cai made a presentation on the 4th international conference on environmental pollution and Health and he particularly acknowledged the contributions of subject librarian to the research. He presented the visualization results (Fig. 4-Fig.7) on the conference, to demonstrate the distributions and measurements of major researchers, institutions subjects and hot topics in this field. He also pointed out the significant research gap between USA and China in this area, which was a result of the literature investigation done by the subject librarian in knowledge acquisition process.

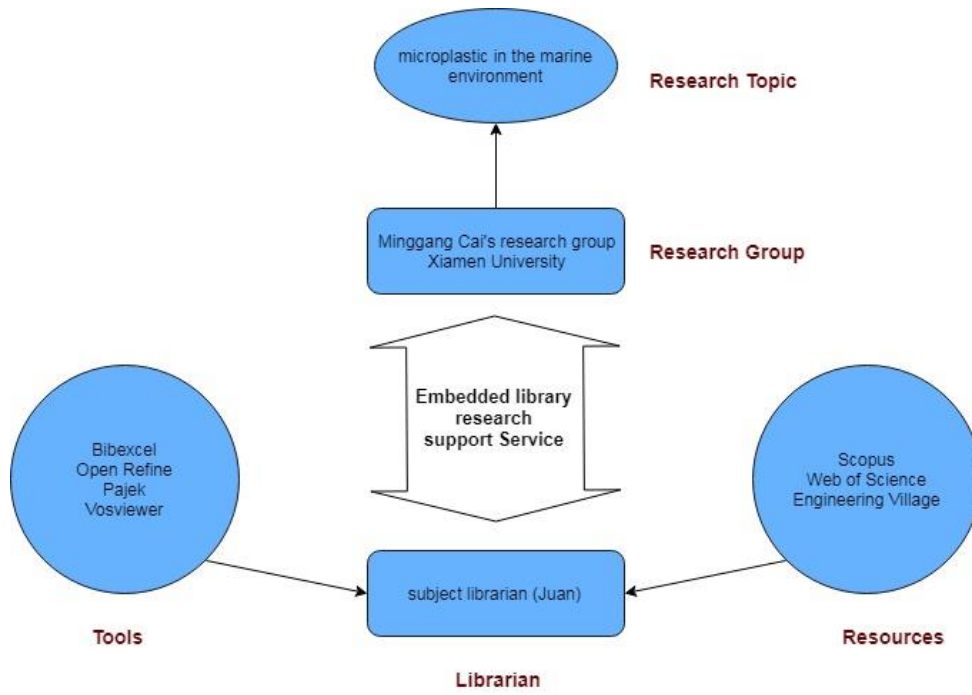


Fig. 3 KM Elements

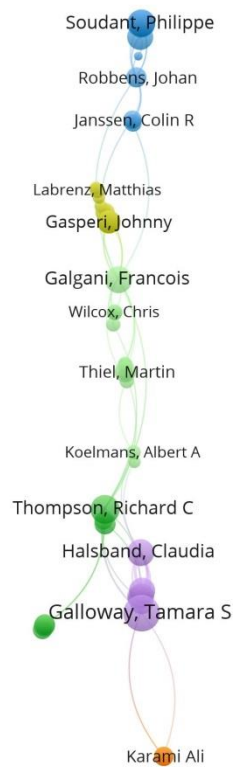


Fig. 4 Co-Author Network of Micro-plastic on Marine Environment Studies

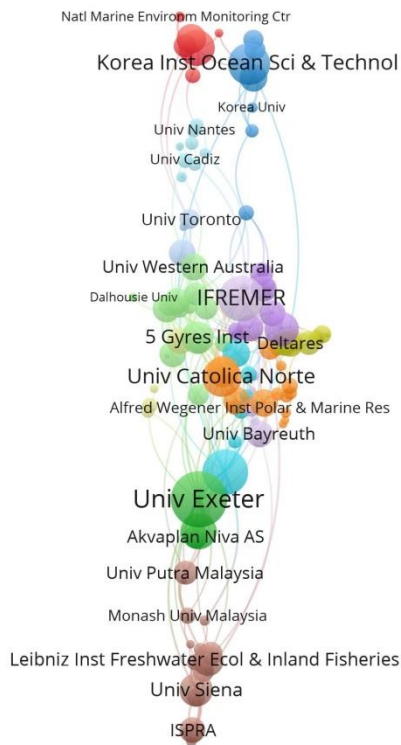


Fig. 5 Co-Institution Network of Micro-plastic on Marine Environment Studies

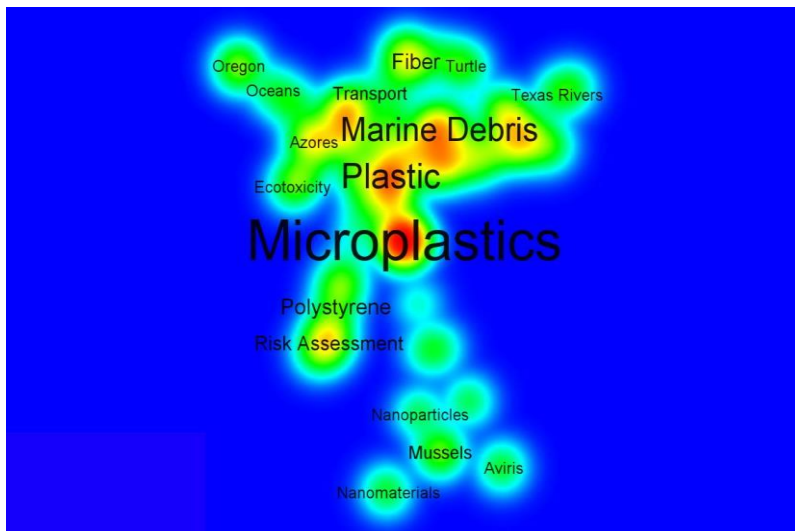


Fig. 6 Co-Keywords Network of Micro-plastic on Marine Environment Studies (USA)

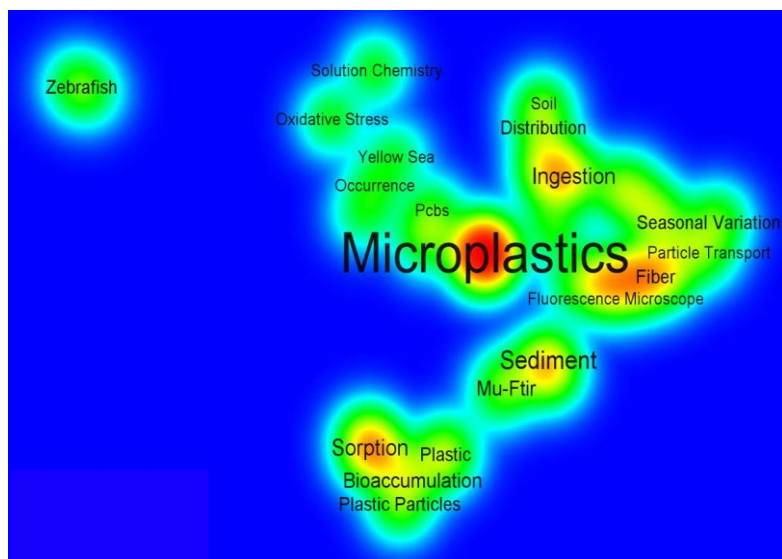


Fig. 7 Co-Keywords Network of Micro-plastic on Marine Environment Studies (China)

Conclusions and Discussions

This article proposed an embedded library research services model, which is a new academic library service model based on knowledge management process. The library knowledge management services focus on the interaction among librarians, researchers (patrons), technologies and library resources. Community knowledge acquiring, organizing, sharing, creating, and application become the main tasks of library services. Knowledge management provides an effective and concrete foundation for librarian to establish relationships among users, technologies and resources in the context of community. The core concept of knowledge management services is to develop a knowledge base for research community to find and develop relevant knowledge, to identify the knowledge that should be shared, and to preserve community knowledge for long time. Based on providing embedded research support services, plus embedded teaching support services, academic library becomes a platform for knowledge collaboration and sharing on the campus.

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