Research on Data Integration of Knowledge Management System Based on Web Services

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Keywords: Web Service; Knowledge Management; Data Integration; Resource

Abstract. The concept of Web knowledge service is proposed with regard to the issues on sharing, integration and reuse of heterogeneous distributed Web knowledge resource combined with Web service technology in order to provide an architecture of knowledge management system based on Web knowledge service, which provides a kind of new method and train of thought for knowledge sharing and reuse in knowledge management based on Web and expands knowledge management theory based on Web. The architecture realizes knowledge management based on Web through three layers of service base layer, service application layer and service user layer. It is easy to build knowledge management system based on Web and effectively realizes knowledge sharing and reuse in knowledge management based on Web according to the architecture. Finally, the application of architecture of knowledge management system based on Web knowledge service is described through an example.

Introduction

We live in the ocean of information, but hunger for knowledge; in face of massive information, but disorderly, psoriasis-style online advertising spread in every corner of the network; Internet false information overflows. We do not know how to effectively organize and link, efficiently extract and use the scattered knowledge we already have, which results in energy consumption, waste of information and low efficiency in personal work; the reason is because there is no effective management for personal knowledge.

Personal knowledge management as a new concept and method of knowledge management, is to help individuals to effectively manage the rapidly growing information, transfer a variety of scattered, random information obtained by the individuals into personal knowledge which can be systematically used, and effectively convert personal tacit knowledge into explicit knowledge through computer technology, communication technology and network technology to build a personal knowledge base, so as to facilitate the current and future storage, use and exchange of personal knowledge. The emergence of Web2.0 must require a new form of personal knowledge management. New technology platform also provides the possibility for new personal knowledge management. Personal knowledge management requires that the fragmented and random information is integrated into explicit resources and form a personal knowledge management system to carry out knowledge management operations throughout the system. It maximizes the convenient functions of network and ultimately promotes progress of the people in order to achieve a continuous learning innovation and construction process.

Design of Knowledge Management Space

The common and convenient tools are used for personal knowledge management based on the simple, effective, economical and practical principle in the Thesis. Social software is easy to learn and use, and it is a network platform not dependent on the personal storage space. As long as the Internet tools are provided, the knowledge management can be conducted anytime or anywhere, and the data maintenance is relatively safe. In the Thesis, Web2.0 social thinking, blog, link splicer, SNS and instant chat and other popular network applications are integrated together to give full play to the characteristics of various network applications; and personal network space of knowledge

management targeted, user-friendly, controllable and easy for knowledge accumulation, sharing and exchange is established by the individual efforts and team learning concept through custom features, so as to enhance the learner's efficiency, personal information literacy and core competitiveness, and promote training on learner teamwork and innovation ability.

The platform consists of nine main modules, namely blog, link splicer, QQ, SNS, micro-blog, forum, email, team learning space and collaborative Wiki. Through the design, the platform aims at enhancing the interactivity of the network platform through Ajax technology, achieving automatic push of articles with RSS technology, knowledge map through combination of TAG social function and SVG scalable vector graphics technology, and automatic classification of knowledge through text classification and clustering technology.

Web as a platform

Successful WEB 2.0 site is to use the ability to integrate user collective intelligence through the browser. The more the contents provided by users are, more popular and valuable the WEB2.0 site will be. As the Web is used as a platform rather than the installation of a dedicated client, you do not need to download, install and upgrade, and you can use it convenient and quick through surfing the Internet the Internet anytime or anywhere. The advantage of using WEB as a platform is that as long as there is a terminal that can access the Internet, you can enter the knowledge management space interface anytime or anywhere, record the life and manage personal knowledge management.

The WEB is used as a platform to optimize the combination of social software; first of all, we can generally divide the software for personal knowledge management into four categories based on the function of social software in the process from the information acquisition to knowledge generation by users; the first category is the personal information management software; the second category is the data or content management software; the third category is knowledge incubation software; the fourth category is academic research software.

The first category of software emphasizes the timeliness of information processing and requires quick finding and forwarding information. This kind of software generally has the storage and dispatch ability of personal information which is closely related to the daily life. The new generation of software more emphasizes interconnection with function equipment such as mobile phone, PDA in order to obtain faster information input and output speed to bring greater utility to the users.

The second category of software focuses on collection and centralized management of knowledge, with the goal of establishing personal knowledge base or personal library for personal development needs. This kind of software is generally provided with interface for network data; some of the interfaces can be embedded in the browser to directly save data on browsing and can be used to edit the data.

The third category is mainly used to record the inspiration of users at any time and a lot of reflection after reading.

The fourth category of software mainly faces to academic research groups, and mainly provides better support to academic research activities.

We need to reflect these four kinds of software according to the different characteristics of learners, a certain proportion and function on platform design to fully embody the personalization, humanization and socialization of learners. A variety of network applications can be customized to ensure that learners can quickly and efficiently carry out the accumulation, sharing and communication of knowledge through the platform.

Principle for establishment of the platform

The space platform for personal knowledge management should be of personalization, humanization and socialization of learners. A variety of network applications can be customized to ensure that college students can quickly and efficiently carry out the accumulation, sharing and communication of knowledge through the platform

(1) Firstly, the user interface should be personalized. Secondly, the users can participate in online social activities with the identity of virtual individuals in the pursuit of individuality, so as to fully demonstrate their unique personality.

(2) The value of knowledge is reflected in the exchange of knowledge and collaboration. The function of knowledge sharing is designed on the platform for dissemination and sharing of knowledge between users. The users publish, collect and recommend articles, while they recommend article sharing and determine whether the article will be displayed on the home page through the user's votes. Through knowledge sharing, information with good quality and new opinions can be effectively disseminated to promote communication and communication of knowledge.

(3) In order to better meet the user's operating habits, the blog, link splicer, micro-blog, QQ and other functional modules are used on the platform.

(4) The blog, link splicer, micro-blog, forums and other Internet applications can fully reflect the three principles of knowledge management, namely accumulation, sharing and communication of knowledge.

(5) The other articles related to the content of the article are listed according to the contents, keywords and TAG of the article, so that the search of knowledge can be more effective.

Personalized space, knowledge sharing

The greatest characteristic of this platform is that there is personalized space, and social network has been established for this space, which can provide convenience for users to carry out private collection, classification, and share knowledge with others. By combining personal conditions, users can choose to collect knowledge that they want to treasure up. Besides, users can make operations like reclassification, edit, deletion, and recommendation of their collections. In this thought based on six degrees of separation, knowledge is shared and communicated through friends and contacts to establish study circle and academic circle of users, which can reduce information search time and realize effective use of knowledge; in addition, learners can access this personalized space through different terminals, which can ensure record of small inspirations of users coming out at any time and their reflection after wide reading

The following overall design of system structure is made based on establishment principles and ideas of the above platform.

Main applications of WEB2.0 in knowledge management are included in functional modules of the system; there are 6 main modules which are blog, wiki, link splicer, content syndication as well traditional file management and forum. Tag technology and RSS technology of WEB2.0 are also added in traditional file management and forum modules, which integrates all functional modules, and finally aggregates knowledge in personalized home page of users.

The above is the design of personal knowledge management platform system; in this system, interfaces and all functional modules are preset through the system; but learners are allowed to choose interface design independently and update these interfaces periodically, which can meet demands for interfaces and functional modules of different learners.

Modules in the platform are as follows: blog is a module for staff to record their feelings and experiences as well as daily work; through it, knowledge owned by people can be expressed explicitly. Wiki is a collaborative writing system, through which intelligence and ability of staff can be effectively gathered; besides, repeating modification and improvement of an entry, a rule, or one page of project document can be carried out, thus reaching a relatively consistent opinion at last. Link splicer is a module which can be used to assemble network resources collected by staff; in such way, staff can share and use those resources while not need to “look for a needle in a bottle of hay”—search for information in the sea of Internet, which is efficient, convenient, and fast, and also prevents most repeated thinking and labor. People can chat and make video communication through QQ; QQ has strong e-mail function; besides, people can discuss in different groups, classify and conclude chatting records and also post them in personal knowledge management space. As a supplement of blog space, microblog can be used to record small inspirations of learners coming out at any time in any place; the number of online users of microblog is quite large. Learners can access other modules selectively according to habits. The biggest characteristic of this platform is that real-time communication tool QQ and microblog are combined in it; learners can enter into this platform to set personalized space; there are QQ and microblog modules in this platform; learners

can access this platform through different terminals; in such way, learners can chat and express feelings whenever and wherever possible; besides, learners can also input feelings and experiences as well as chatting records in knowledge management space rapidly.

The design of knowledge acquisition subsystem for learners is as follows:

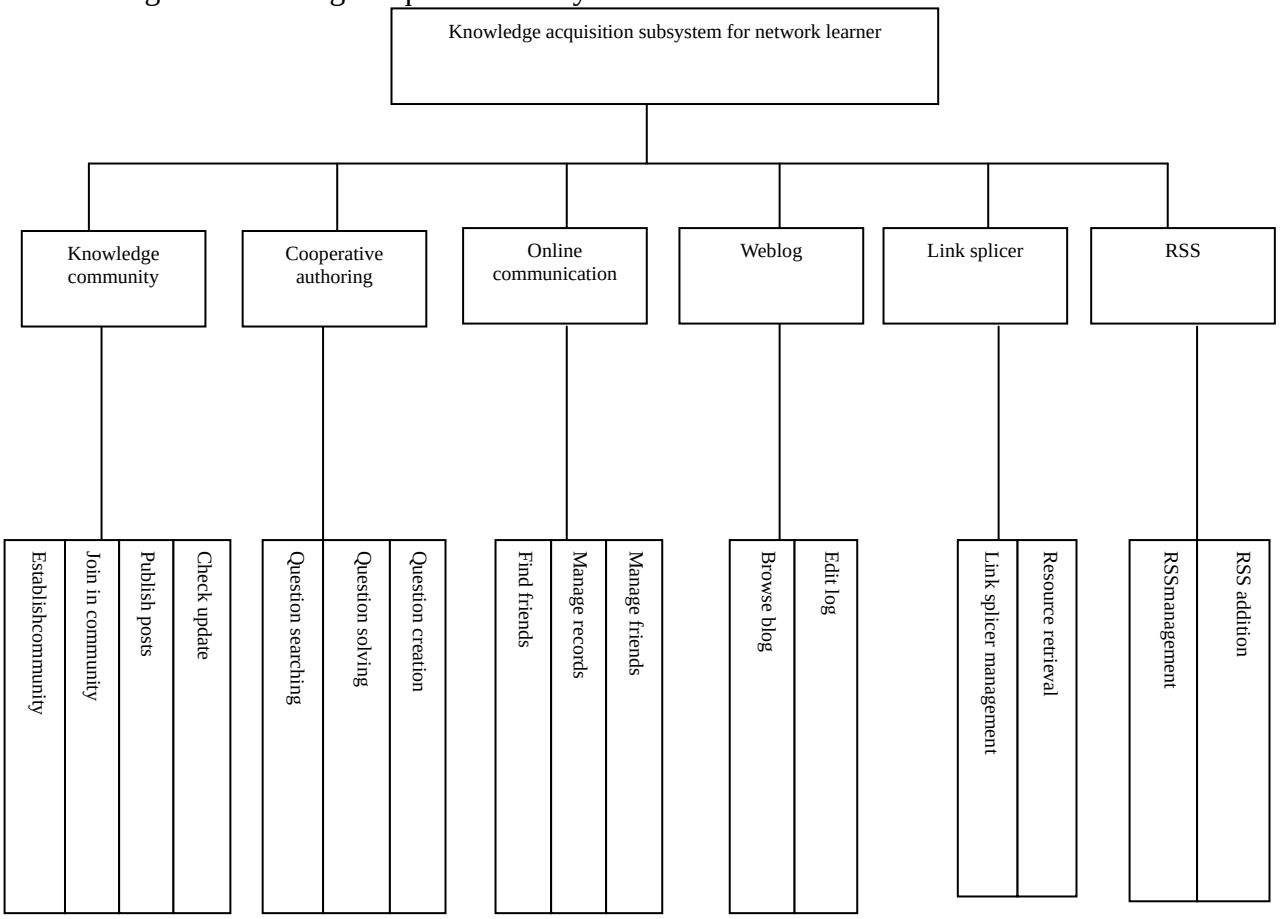

Fig.1. Resource Integration based on Web Servic

This system is a brief diagram showing how learners obtain knowledge; each registered user can own one personalized Blog space; in management interface of all blogs, there are basic system settings, log writing, log management, TAG management, comment management, and import and export of RSS; learners can record their reflection on study through writing Blog or microblog which can be accumulated to form personal knowledge warehouse. During knowledge accumulation process, not only learners' ability of problem analysis and problem solving will be practiced, but also their ability of problem raising, problem analysis, and intensive study of problem will be improved, which will further promote the development of information literacy competency of learners. Through Blog functions of comment, TrackBack, and RSS, learners can share knowledge and communicate with others who follow their Blogs; at the time of posting logs, learners can add TAG defined by them or preset by the system, which will provide convenience for other learners to find knowledge that they need rapidly. According to six degrees of separation, the connection mode of personalized spaces of undergraduates is changed from weak connection to strong connection; in this way, a study circle will be formed around personal space gradually, which can promote wide spread of knowledge.

The following is management subsystem of personal knowledge system of online learners:

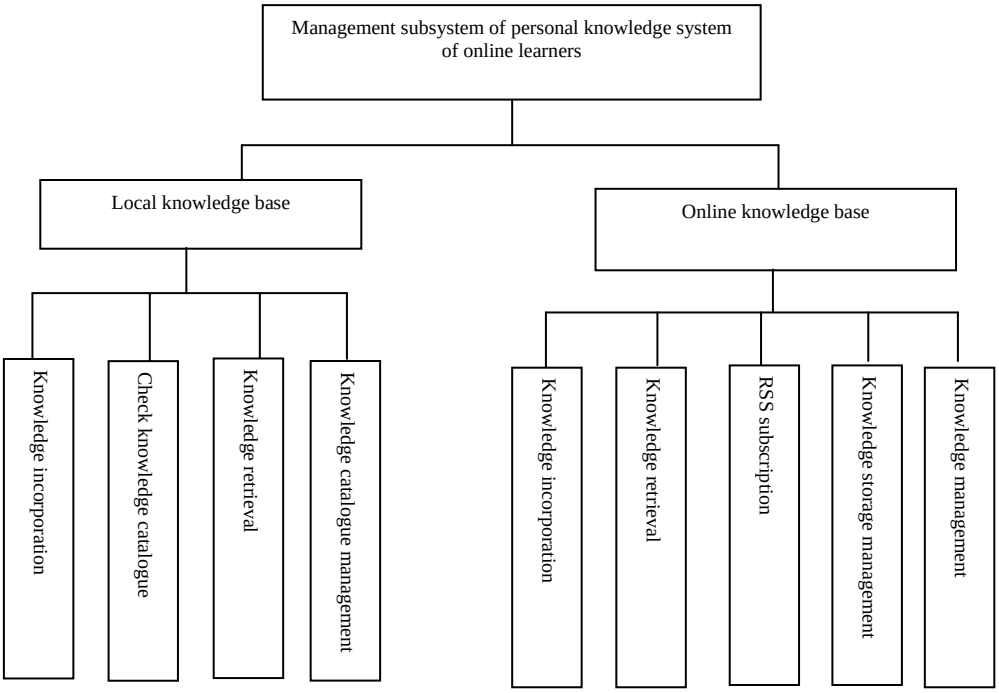

Fig.2. Knowledge management system

This system is a block diagram showing how learners manage their own knowledge system; learners can use the function of knowledge catalogue classification preset in the system, or they can define knowledge catalogue themselves; in short, learners can remold their own knowledge system to make the system accord with the habit and thinking mode of them according to their own willingness.

Conclusion

It is impossible for us to provide a knowledge management space which is suitable for every one; we can only optimize and organize the software and functions which are most commonly used by learners together to stimulate learners, and leave most part of autonomous right to learners to change Internet surfing habits of learners and let learners create, browse, chat freely on this platform and to manage and share their knowledge independently. There are still many deficiencies in this knowledge management space, gradual optimization and improvement are expected to be made in future practice.

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