Journal of Applied Science and Engineering Innovation, Vol.3 No.5, 2016, pp. 152-156
ISSN (Print): 2331-9062
ISSN (Online): 2331-9070

A Knowledge Service Oriented Information Management Platform

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Abstract: Knowledge service oriented information management platform is a mandatory requirement in information obtained applications. In this paper, knowledge service and its realization process is introduced, a knowledge service description model is proposed, the function of the knowledge service oriented information management platform is analyzed, and its basic structure is discussed. In view of Web applications background, the framework of knowledge service oriented information management platform is proved, and the platform is developed. The actual application can be satisfied with using the information management platform.

Keywords knowledge service; knowledge service model; information management platform; knowledge object

INTRODUCTION

With the rapid development of information technology and the improvement of productivity, the society has entered the era of knowledge-driven economy. Knowledge and information are becoming the most important factor of production replacing the traditional material resources. Knowledge is one of the most valuable times resource in the nowadays, the function of which appears in each aspect. People expects to acquire the knowledge content of one's own needs from the numerous information urgently with the aim of forming the decision-making, therefore, knowledge services[Li.2014] just emerges at the historic moment. Knowledge service also becomes the urgent need to develop knowledge economy and realize knowledge innovation. Information platform [Kou *et al.*, 2015,] [Muhammad *et al.*, 2015] general refers to the aggregate with the complete function collecting, storing, handling and spreading various information. Information platforms are plays an irreplaceable role in many aspects such as real life, government management, enterprise experience management, etc. This paper tries to apply the knowledge service to information management platform, which overcomes the deficiencies in personalized, adaptive and intelligent service.

KNOWLEDGE SERVICE LIMITATIONS

Knowledge service integrates the related knowledge resources distributed according to the content or the requirement, and seals to a series of service forms adapting to the various kind of task demands and knowledge demands. It shields the difference between the different platforms, the different systematic, the different language, the different model, which makes the knowledge resources in organization get better sharing and reuse. Knowledge Service is a service process to meet customer different kinds of knowledge demands, which process is that knowledge service provider relies on the high specialized knowledge, on the basis of full mining customer needs, combined with the information and knowledge of internal or external to the organization collecting and arranging, carries on the knowledge innovation, and in the process of interaction with customers draws support from the suitable method and mean to help customers gain knowledge, improve customers problem-solving ability, help customers make rational decision, or directly help customers solve problems. Knowledge service has the characteristics of purposiveness, timeliness, and planning and resource reusability and so on. General flow of knowledge service includes five aspects such as requirements analysis, information gathering and storage, information analysis and information integration, information intellectualizing, knowledge application and feedback and so on [Li *et al.*, 2015,] [Li *et al.*, 2014].

(1) Demand information searching

Grasps accurately customer explicit and implicit requirements by the investigation methods etc., formulates service plan according to customer requirements and their ability, and establishes special database.

(2) Information analysis and integration

The knowledge service experts carry on screening, classification, analysis and reorganization and so on preliminary process to the related requirements information collected, forms the useful information

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for intellectualizing. These methods include discarding the dross and selecting the essential, eliminating the false and retaining the true, system classification and so on.

(3) Information intellectualizing

The information intellectualizing is the core link of the whole knowledge service process, is also the key link of the final service products formed the core part. Knowledge service experts with the professional knowledge and experience, deep card and refine the formed information resources, to find the contained deeper information, after undergoing the further refinement and innovation, form the knowledge service product to satisfy the client's requirement.

(4) Knowledge application

According to the characteristics and requirements of clients, knowledge service experts design highly individualistic knowledge service products, and help the target client to realize the knowledge application and innovation.

(5) Knowledge service feedback

According to the union condition of new knowledge and actual requirements, the user feeds back the use condition of new knowledge to the knowledge Service organization.

KNOWLEDGE SERVICE MODEL

The realization method of knowledge service is in various forms, the choice of the realization way directly affects the quality of knowledge service provided. In general, knowledge service consists of two parts: interface part and content part. Carrying on the analysis and modeling from knowledge itself and mode of action of knowledge in the system or in the organization and other aspects, a knowledge service model can be expressed as a five-tuple: KSM = <Meta_info，Input，Output，Taxonomy, Contents>.

Where:

Meta_info (meta-information) is used to define the basic information about a service, such as service name, creator, subject, introduction, creation date and so on.

Input and 0utput expresses the service interfaces, which is the corresponding part of the interface with Web service description. Input is used to define the set of service access and running required input parameters and type; Output is the set of service output result and style, the form of the output may be specific information, may also be an implementation plan or other type.

Taxonomy (classification) is used to set the service category and service level. It can customize according to the custom-made template of user preference and so on, the description of template is optional.

Contents are used to define the service context, service semantics, knowledge and inference and knowledge function, etc.

FUNCTION OF KNOWLEDGE SERVICE INFORMATION MANAGEMENT PLATFORM

As an intangible production activity, knowledge service needs a perfect management tools which are used for storing and retrieving the information resources of knowledge service process. As an independent management tool, information management platform can realize arranging, processing, storing, searching the new information in the process of knowledge service, etc. By analyzing the demands of knowledge service oriented information management platform, we may discover that it has the following function to the knowledge service:

(1) Provides a "system environment" for the knowledge service main body and improves the service efficiency and management level to reduce the management cost;

(2) Provides a platform for the knowledge service providers and alleviates the burden of knowledge service personnel to improve work efficiency;

(3) Provides a management and control platform for the knowledge service management personnel and enhances the management and control ability to improve the transparency through the "routing" operation of information management platform;

(4) Provides a knowledge platform for knowledge service users to provide them with knowledge of the various decision-making needed.

On the other hand, knowledge service has also special requirements to information management platform, needs a detailed analysis of the business process of the specific knowledge service main body, and to be unified with the information system function.

We say that the information management platform based on knowledge service is stronger pertinence than the common information management platform.

KNOWLEDGE SERVICE ORIENTED INFORMATION MANAGEMENT PLATFORM

Basic Structure of Knowledge Service oriented Information Management Platform

The basic structure of knowledge service oriented information management platform is made up of intelligent search discovery, knowledge management, intelligent information push, personnel management, system management, knowledge service engine, and knowledge base and system database. Figure 1 shows the basic structure.

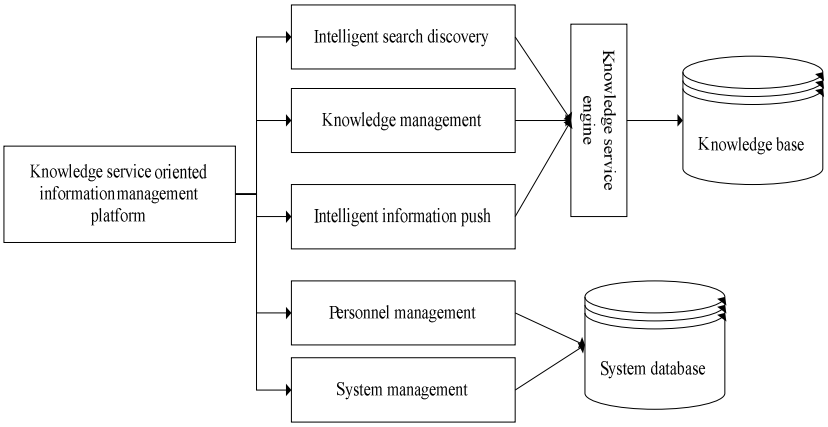

Figure 1. Basic structure of knowledge service oriented information management platform

(1) Intelligent search discovery

We obtain the knowledge products which accord with user's information demands through intelligent inquiring to the unified information resources space and unearth those implicit, ambiguous information and knowledge to satisfy the consumer needs much better in the field of recall ratio and precision ratio.

(2) Knowledge management

Constructs the knowledge base of information system, put to the numerous and complicated knowledge contents (scheme, planning, system, etc.) and forms (picture, word, excel, ppt, pdf, etc.) into different categories for administration.

Carries on the reorganization processing to the source materials, forms the rudimentary knowledge, carries on the appraisal, the judgment, the verification and the consummation to the preliminary knowledge, forms the formal knowledge.

(3) Intelligent information push

According to user's fondness, realizes the hot spot information, key information present and RSS management and the timing information gathering and updating and so on.

(4) Personnel management

Realizes information management such as system user's real name, gender, login name, login password, department, staff type and access control. The different user has the different access authority according to the authorization, which realizes the nimble access authority control.

(5) System management

Realizes administration such as system configuration, data back-up, data recovery, and data storing equipment, provides the safeguard for system's stable safe operation.

(6) Knowledge service engine

Knowledge service engine is the core of knowledge working of knowledge service-oriented information system. It is responsible for cooperative work between the man-machine and the knowledge, and processes system personnel's knowledge demands in time and feedbacks the handling result to this personnel.

(7) Knowledge base

Knowledge and information resource is the basis of intelligent search discovery and intelligent information push. Knowledge is a repository to store and manage the knowledge object, which supports various granularities of information objects storage, access and query.

(8) System database

System database is a database to store user information, user permissions, system configuration information, department information, category information and other data information system, etc., which realizes the effective storage of the system basic data.

Knowledge Object in Information Management Platform

Judging from knowledge level, the knowledge object in information management platform includes domain background knowledge, learning knowledge point and learning knowledge content carrier.

(1) Domain background knowledge

Concept is used as the basic unit of organizing knowledge, is the node composing and binding with knowledge. Concept reflects the peculiar essential attribute of object, phenomenon and process, the network structure composed of multiple relationships between the concept and the concept constitutes the basic framework of the knowledge system.

(2) Information knowledge point

Knowledge spot is the basic unit of teaching knowledge organized, is also the basic unit of learning resources attached. The knowledge spot is generally regarded as a knowledge object that can exist independently and cannot be subdivided again.

(3) Information knowledge content carrier

Information knowledge content carrier is the smallest carrier having the information supplying function. It is of many types, can be used to describe with metadata to facilitate its retrieval and reuse. It not only need to describe physical properties such as name, storage, media formats and file size, still need

to describe knowledge content attributes such as theme, term, description, form and content etc.

DESIGN AND IMPLEMENTATION OF INFORMATION MANAGEMETN PLATFORM

The main function of the information management platform is to get the information resources from information resources repository, track the user's personal interest, and carry on the filtration to the information resources according to user's personalized interest characteristic, and help users quickly and accurately retrieve and recommend the interested resources in mass information resources. Figure 2 illustrates the framework of knowledge service oriented information management platform.

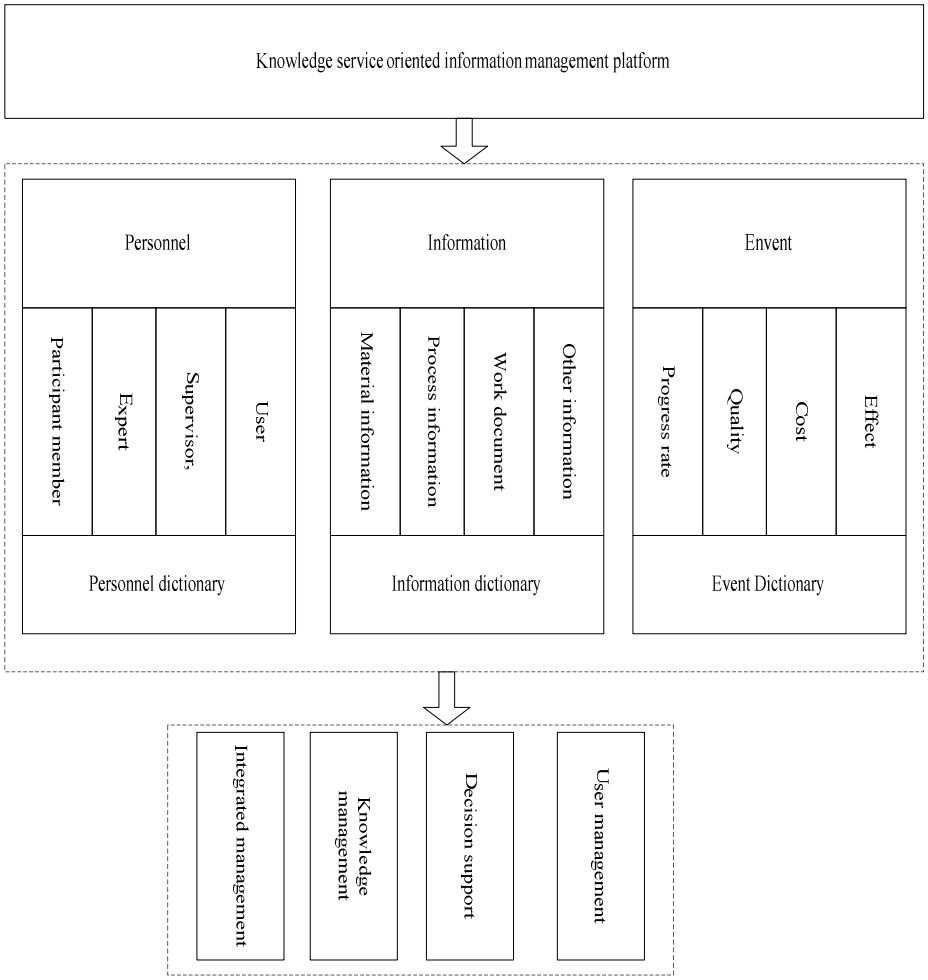

Figure 2. Framework of knowledge service oriented information management platform

Knowledge service oriented information management platform utilizes data dictionary to regulate three aspects data of events, people, and information. Each dictionary tables can be defined by the user. The system can be applied to different types of information to form information to their unique workflow, different information, and different events, with one person can have multiple roles and identity in the dictionary.

Event Dictionary: each process of project management process is considered as the event, each process is regulated to form the dictionary;

Information dictionary: The information is defined according to the category, the documents attribute and so on. It provides the corresponding model for painting;

Personnel dictionary: It regulates the information of the personnel in the process such as the role, the status (participant member, expert, supervisor, user, etc.) and so on.

It realizes the integrated management, the user management, the knowledge management and the decision support function after information is counted, analyzed, searched, organized, and refined.

The system knowledge service mainly includes personalized filtration, personalized recommendation, and personalized retrieval, self-adapting presenting for knowledge, etc. Service configuration determines to provide the necessary hardware and software

environment for the knowledge service. Service means choice type generally has three selection modes of voluntary offer, system default and customization. Service delivery mode changes with the service type, user type, user preferences vary. Relationship with other services common has cooperation, call, parallel, preorder, follow-up, replacement and include and so on.

Using Microsoft Visual Studio c #.net as development tools, combined with the framework and based on B/S model, we developed the knowledge service oriented information management platform.

CONCLUSION

As the knowledge-economy time is coming and information management platform technique gradually matures, knowledge service oriented information management platform has received more and more attention. Information management platform has the formidable support function to knowledge service. The practical reasonable information management platform naturally becomes the carrier for knowledge service.

In this paper, on the basis of studying and analyzing knowledge service, we discussed the knowledge service model, analyzed the function that the information management platform serve to knowledge, presented the basic structure of knowledge service oriented information management platform and the knowledge object, given the basic structure of the system. At present, the developed information management platform has been widely applied. The application result shows that the platform can meet the requirement that the information management platform offers knowledge service, has certain practical value.

ACKNOWLEDGMENT

This work is supported by Natural Science Foundation for Young of Henan Polytechnic University (No. 13A510325) and Science and Technology Program of JiaoZuo (No. 2014400023).

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