# A Framework for Ontology-Based Knowledge Management System Case Study of Faculty of Business Administration of Rajamangala University of Technology ISAN

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## ABSTRACT

The objective of this study was to develop ontology-based Knowledge Management System (KMS) of Research Case Study of Business Administration Faculty of Rajamangala University of Technology ISAN. This research used Research and Development Methodology based on the principle of the Knowledge Management System Development Life Cycle. The development tools was Hozo-ontology Editor . Hozo-ontology Editor used to develop ontology-based and created relationship between 16 domains 46 nodes. The ontology-based KMS was evaluated by experts. This study present ontology-based KMS design and development that will be used by the system. The main of domain are research project. The system disseminates and utilize knowledge of research of Faculty of Business Administration Rajamangala University of Technology ISAN.

Keyword: Ontology-based, Knowledge Management System

## 1. INTRODUCTION

Nowadays, it is the Knowledge-based economy era which is affected by the increasing use of information technology. It is based on the production, distribution and use of knowledge and information [1]. Knowledge management (KM) is a crucial activity in organizations since knowledge is considered the most important asset that enables sustainable competitive advantage in very dynamic and competitiveness advantage. KM has become one of the most important developments in the new business environment [2,3]. KM is observed that many organizations either have a KM in place or are planning to develop one. Most industries try to use available information to gain more competitive advantages than others. According to the analyst business IDC (International Data Corporation), business spending on KM could rise US$101 billion in 2015, increase of 4.4% compared to 2014, with rigorous investments in technologies to boost efficiencies and innovation as well as in knowledge management. [4]


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Even though firms have deployed KM, with mixed success, for employees to access, share and apply knowledge using Knowledge Management System (KMS), it is understandable, when confronted with a new problem that they look to new decision-making methods for guidance. Many members(employees) have tried using KMS to improve their tasks [5]. The development of effective KMS has become an important issue n applied domains.

The goal of a general KMS is to collect, manipulate and provide the right knowledge to the right people at the right time and in the right format. The KMS users can access and utilize the rich sources of information and knowledge stored in difference resources and forms. The KMS facilitate people sharing knowledge and creating new knowledge. The KMS are based on the existing information repositories. The knowledge discovering of traditional KMS, users submit quires and receive knowledge by keyword match. The keyword-based cannot understand the meaning of data and information. They are inflexible and stifle for knowledge or innovation creation.

Fortunately, the emerging ontology-based KMSs can fine the content-oriented knowledge that people really want due to the fact that the domain ontology is powerful in knowledge representation and associated inference. Ontologies are meant to provide an understanding of the explicit domain knowledge that facilitates knowledge collect, manipulate, retrieval, store, sharing and dissemination. Ontology can be regarded as the classification of knowledge [6]. It defines shared for facilitating knowledge collect, communication, store, searching and sharing in KMS.

In the study, we propose A Framework for Ontology-Based Knowledge Management System case study of Faculty of Business Administration of Rajamangala University of Technology ISAN that mainly focused on analysis and synthesis knowledge about research of Faculty of Business Administration of Rajamangala University of Technology ISAN. The researches are research project, research paper, thesis, individual study and senior project.

## 2. THE PURPOSE OF RESEARCH

2.1 To analysis and synthesis knowledge about research of Faculty of Business Administration of Rajamangala University of Technology ISAN.

2.2 To develop ontology-based KMS about research of Faculty of Business Administration of Rajamangala University of Technology ISAN.

## 3. MATERIALS AND METHODS

The study was conducted in two phases. The first phase was to analysis and synthesis knowledge about research of Faculty of Business Administration of Rajamangala University of Technology ISAN. The second phase was to develop ontology-based KMS about research of Faculty of Business Administration of Rajamangala University of Technology ISAN. Our proposed methodology divided ontology into three types: generic ontology, domain ontology and task ontology. The


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approach to implement ontology-based KMS, we used the ontology-editor. The ontology-editor is Hozo Ontology editor.

***The Sample***

The first phase, analysis and synthesis knowledge about research. The researches are research project, research paper, thesis, individual study and senior project. They were 250 items from repositories of Faculty of Business Administration of Rajamangala University of Technology ISAN. And the second phase, three experts from both inside and outside of Rajamangala University of Technology ISAN took review the ontology-based KMS.

***Instrument***

The instruments used in this study was Hozo-ontology editor. The Hozo-ontology editor developed by Osaka University. It is Java-based graphical editor especially created to produce heavy-weight and well thought out ontologies. The research program Hozo-Ontology Editor as a tool in the development of the concepts and relations of knowledge about research of Faculty of Business Administration of Rajamangala University of Technology ISAN.

***Data Analysis***

The data, information and knowledge about research of of Faculty of Business Administration of Rajamangala University of Technology ISAN collected were refined. We used concept map analysis and synthesis knowledge about research of Faculty of Business Administration of Rajamangala University of Technology ISAN to represent knowledge about research domain and node. We adopt Hozo-ontology editor to build our domain ontologies.

## 4. RESULTS AND DISCUSSION

### 4.1 The ontology-based KMS of Faculty of Business Administration of Rajamangala University of Technology ISAN

Ontology building: we adopt Hozo-ontology editor. Hozo-Ontology Editor used to develop ontology-based KMS and created relationship between 16 domains 46 nodes as shown in figure 1.


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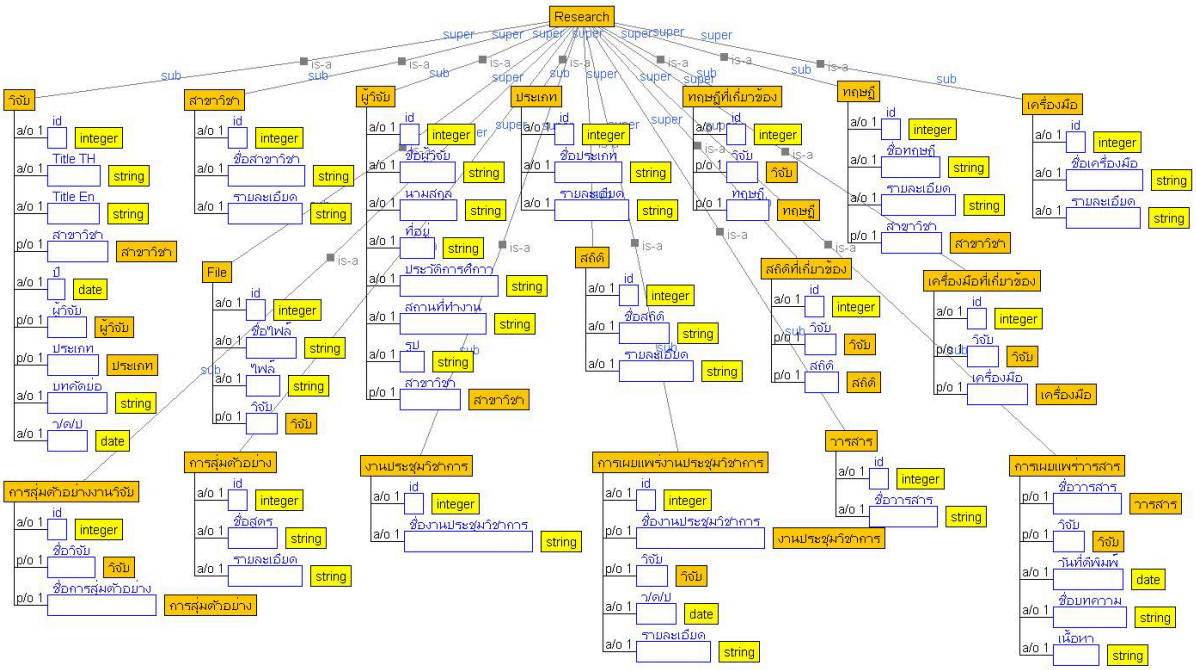


**Figure 1** The ontology-based KMS of Faculty of Business Administration of Rajamangala University of Technology ISAN

Our ontology-based KMS include ontology domain: research, typeresearch, researcher, department, theory, theories, tool, relationtool, stat, relationstat, randomsampling, conference, conferencepresent, journal, journalpublished and file.

Our ontology-based KMS of Faculty of Business Administration of Rajamangala University of Technology ISAN used Client server architecture are used to prevent data loss. The architecture of KMS are shown in Figure 2.

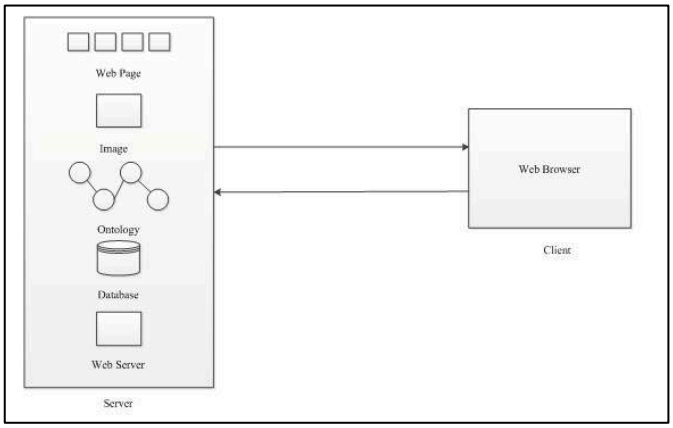


**Figure 2** The architecture of ontology-based KMS


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Based on the event Table above, the next step is design systems functionality by using use case diagram. The use case diagram divided into two parts, first is knowledge creator access and the second is user access as shown in figure 3, in each use case within use case diagram reflects KMS function.

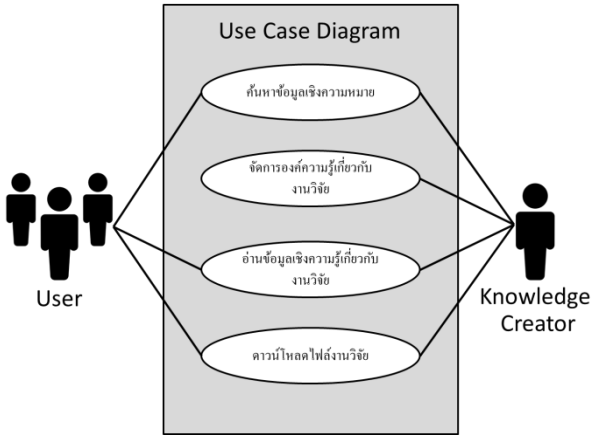


**Figure 3** The use-case diagram of ontology-based KMS

## 5.RESULTS

This study presents the prototype ontology-based KMS and architecture of Faculty of Business Administration of Rajamangala University of Technology ISAN. It adopts a three-stage life cycle for the ontology design and a Hozo-ontology editor for create knowledge domain and relationship. Through the successful create ontology-based KMS, it has been proposed to address limitations of current ontology-based KMS research that only focus on managing organization knowledge. The most important role of ontology-based in KMS is to enable and to enhance knowledge sharing and reusing. However, the difficulties of ontology-based creation are claimed in most literature. Thus, this study focuses on creating ontology by adopting the knowledge management methodology which provides tools to support us for structuring knowledge. Thus, ontology-based was applied to help KMS for the faculty to achieve their goals.

## 6. CONCLUSIONS

In this study, we present the ontology-based KMS of Faculty of Business Administration of Rajamangala University of Technology ISAN. The result of study contributes to the broader literature on knowledge management system. The result form the above analysis and synthesis shows that the ontology-based KMS. The ontology-based KMS must be able to support the existing knowledge management cycle in the organization, when the knowledge that has been collected, manipulated,


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stored, shared, and the otherwise made available is put to actual to use. It is expected that systems design model can be implemented by other universities which want to implement KMS.

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