



Research Article

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Design and development of knowledge management platform for SMEs

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ABSTRACT

knowledge economy and information economy under the guidance of the global economy has developed into the center of the economy, the world has entered a new era of knowledge economy, so the knowledge management as a core part of the enterprise survival, in order to improve the competitiveness of the enterprises, the role of enterprise knowledge management platform cannot be ignored. In this paper, it is under the support of this theory to establish the model of small and medium-sized enterprises knowledge management platform, and has carried on the system for the model of fuzzy evaluation, put forward the main influence factor, respectively is the enterprise knowledge base, knowledge workers, system platform and enterprise management. CAI self-study the five general users, by using fuzzy evaluation after finally got the evaluation result for the better level, to prove the rationality of this model, but also proved in this paper, the established design and development of small and medium-sized enterprise knowledge management platform will play a role for future research.

Key words: enterprise knowledge management model, CAI self-study platform, Fuzzy comprehensive evaluation

INTRODUCTION

As early as in the ninety's, "Knowledge management" has received wide attention in the field of business, the human by the 20th century into the 21st century, the development of computer and information technology, improvement in the competitive global economy makes the emergence of a new climax, at the same time, technology and product update also accelerated, so that the knowledge management has become the center in the care of enterprises, so the design and development of enterprise knowledge management platform cannot be ignored [1-3].

Research on knowledge management platform, predecessors have made a lot of efforts and achieved fruitful results, such as: he also has in the influence factors of knowledge management through the research and combined with their own experience for some enterprises are studied, and eventually determines the effect of knowledge management of five factors, then through the investigation, it is concluded that the main influencing factors are respectively, infrastructure, human resources, organizational culture and leadership support, and for the above four factors are expounded respectively, finally got a knowledge management model suitable for the development of small and medium-sized enterprises [4-6]; Zhang huan in the study of knowledge management implementation model based on enterprise business process to build the knowledge platform, formed a system of knowledge map, and then set up the various functions of knowledge management to realize the whole process of knowledge management to run smoothly [7-9].

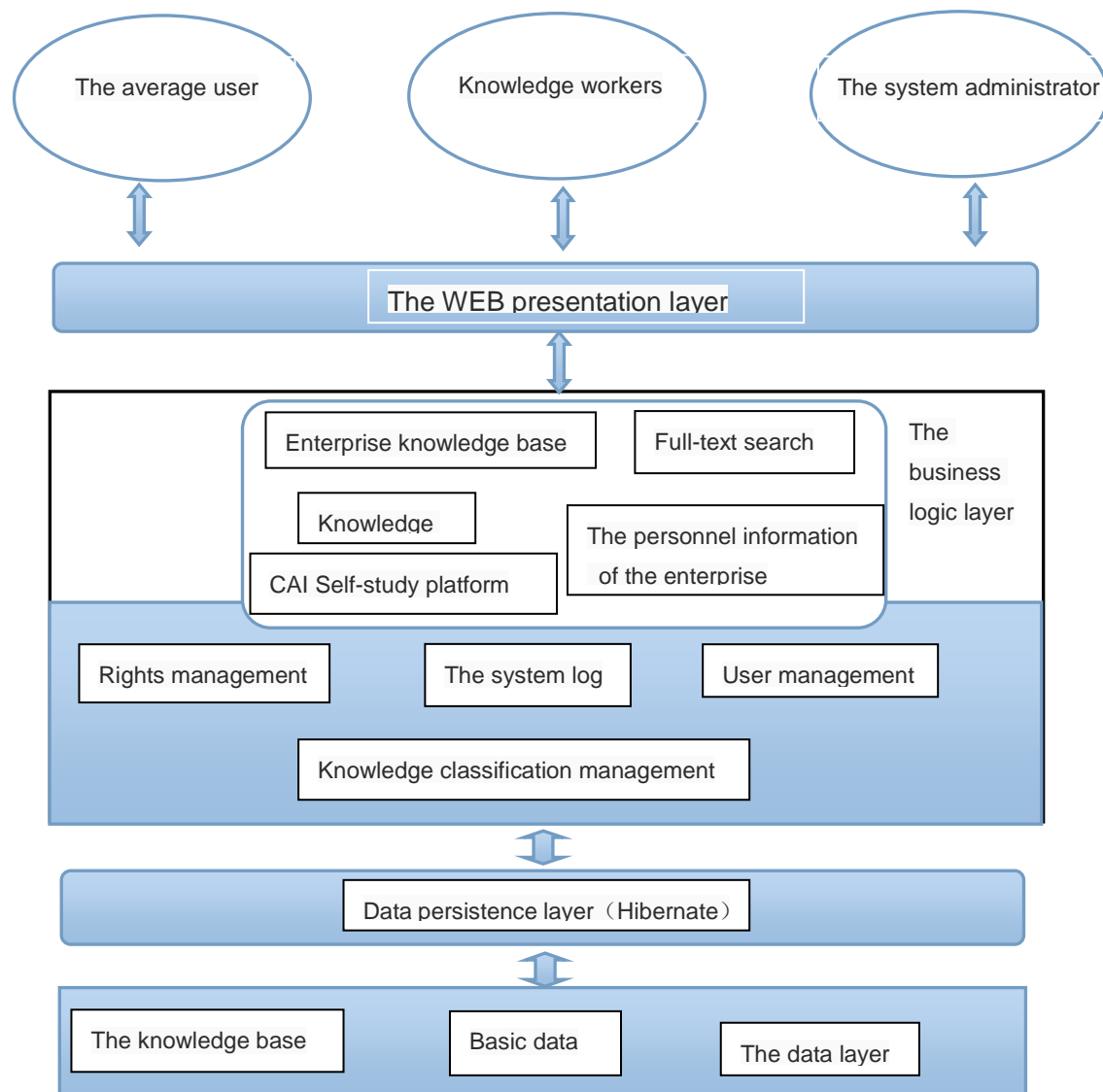
This article is on the basis of predecessors' research knowledge management platform for small and medium enterprises to do the further research, in today's knowledge economy era, it has more knowledge means more opportunities, thus to build a good platform for the knowledge management to improve the competitiveness of small and medium-sized enterprises, creativity, and promotes the development of small and medium-sized enterprises better.

THE DESIGN AND ANALYSIS OF ENTERPRISE KNOWLEDGE MANAGEMENT PLATFORM

SME knowledge management platform designed primarily Knowledge management is the process of design, mainly the transfer of knowledge sharing and application of knowledge, access to knowledge storage and knowledge. Throughout the design process must follow the design principles, in particular the security is particularly important.

Enterprise knowledge management platform model

In this paper, according to the above process, the use of stable performance SQL Server2005 database to improve data calculation using Spring + Hibernate technical route, the establishment of a knowledge management platform for SMEs, the corresponding overall architecture is shown below:



Select some indicators from the framework of the total units of knowledge management platform to study the figure, the following will be discussed.

ENTERPRISE KNOWLEDGE MANAGEMENT PLATFORM TECHNOLOGY ANALYSIS AND MANAGEMENT SYSTEM DEVELOPMENT PLATFORM***Lucene full-text search technology***

When the use of Lucene full-text search, you need to do on the basis of its corresponding secondary development to achieve the desired effect. Lucene search process includes two key technical points, indexing, search technology. In this study, full-text search technology for use Lucene full-text search and keyword search knowledge management platform, and thus facilitate knowledge staff inquiries, while knowledge map is located in full-text search capabilities provide fast position of knowledge.

A knowledge map program

The knowledge management platform needs to establish a clear knowledge map showing the relationship between knowledge; quickly locate the types of knowledge; demonstrate specific knowledge of the title, author, keyword information on the knowledge map; simple and clear user interface, avoiding complex message.

3.3, Enterprise knowledge management platform database design

Database system should be designed in accordance with business requirements, processes, conceptual model database design, take full account of the association between the tables, a reasonable set of primary keys, foreign keys and other attributes.

Development, knowledge management platform system management

Includes: rights management, user management, system logs, knowledge classification management functions. Permissions can be controlled by the user's browser type of knowledge, download range of knowledge; system logging the user during the operation, including login, download, edit knowledge; knowledge management classification used by knowledge workers can all classifications of Knowledge editing, knowledge of the control structure as a whole.

THE COMPREHENSIVE EVALUATION OF KNOWLEDGE MANAGEMENT PLATFORM FOR SMES**Fuzzy evaluation theory**

In order to show a more intuitive built above the reasonableness of knowledge management platform, the paper chose the fuzzy mathematics method to determine reasonable, concrete steps are as follows:

- (1) Establish the factors set $U, U = (U_1 \ U_2 \ \dots \ U_k)$
- (2) Establish evaluation set $V, V = (v_1, v_2, L, v_n)$
- (3) Fuzzy relations fuzzy evaluation matrix from U to V mapping, and thus can be obtained as follows:

$$R = \begin{bmatrix} r_{11} & r_{12} & \dots & r_{1n} \\ r_{21} & r_{22} & \dots & r_{2n} \\ \vdots & \vdots & & \vdots \\ r_{m1} & r_{m2} & \dots & r_{mn} \end{bmatrix}$$

- (4) Establish weight set, $A = (a_1, a_2, \dots, a_n)$, Satisfies the condition: $\sum_{i=1}^n a_i = 1 \ (0 \leq a_i \leq 1)$

(5) Each line fuzzy relation R, reflects the degree of influence factors on the line to determine the object, while each column of R, reflects the degree of influence factors on the object of the line judge.

$$\sum_{i=1}^n r_{ij} \quad j = 1, 2, 3, \dots, m$$

$$B = A \circ R$$

$$= (a_1, a_2, a_3, \dots, a_n) \circ \begin{bmatrix} r_{11} & r_{12} & L & r_{1n} \\ r_{21} & r_{22} & L & r_{2n} \\ M & M & & M \\ r_{m1} & r_{m2} & L & r_{mn} \end{bmatrix}$$

$$= (b_1, b_2, b_3, \dots, b_n)$$

V is the combination of fuzzy evaluation set B , here fuzzy operator is represented by \circ , and b_j represents the state of the corresponding B is a subset of v_j state membership, after the normalization processing. There is $\sum = b_1, b_2, b_3, \dots, b_n$, Then there are: $B' = (b_1 / \sum b_2 / L b_n / \sum) = (b'_1, b'_2, L b'_n)$

Based on the principle of maximum degree were selected, using the theory of fuzzy evaluation of selected elements of knowledge management platform for SMEs to evaluate the size of the final evaluation value to determine the merits of the build platform.

The application of fuzzy evaluation

Knowledge management platform system by the SMEs in part by word selected for analysis, as follows:

Table 1: Factors knowledge management platform for SMEs

Knowledge management platform for SMEs factor (U)	Enterprise Knowledge (U ₁)	Download attachments(U ₁₁)
		Browse Knowledge(U ₁₂)
		Knowledge Management(U ₁₃)
		Knowledge Management Category(U ₁₄)
	Knowledge Workers (U ₂)	CAI Learning Content Management(U ₂₁)
		Knowledge Management Category(U ₂₂)
		Knowledge Audit(U ₂₃)
		Enterprise Information Management Talent(U ₂₄)
		Knowledge Management(U ₂₅)
	System Management (U ₃)	System Log(U ₃₁)
		System privileges(U ₃₂)
		User Management(U ₃₃)
	CAI self-learning platform(U ₄)	Attachment Download(U ₄₁)
		Attachment Content Management(U ₄₂)
	Corporate general users(U ₅)	Full-text search queries(U ₅₁)
Knowledge Map View(U ₅₂)		
Manuscript mailbox management(U ₅₃)		
Talent View(U ₅₄)		
CAI learning and training(U ₅₅)		

Establish evaluation set by the theory that:

$$V = \{v_1, v_2, v_3, v_4, v_5\}$$

= {Very good, Good, General, Poor, Very poor}

Thereafter, for each of the above factors determine, at the same time giving AHP weights, you can get the corresponding judgment matrix, using the above theory corresponding weights can be calculated in the following table:

Table 2: U-judgment matrix

U	U ₁	U ₂	U ₃	U ₄	U ₅	ω _i
U ₁	1	1/3	1/5	1/7	1/7	0.0400
U ₂	3	1	1/3	1/5	1/5	0.0788
U ₃	5	3	1	1/3	1/3	0.1616
U ₄	7	5	3	1	1	0.3598
U ₅	7	5	3	1	1	0.3598
Σ	23	14.333	7.533	2.676	2.676	1.0000
CI=0.0347,CR=0.0310<0.10						

Table 3: $U_1 - U_{1k}$ Comparison Matrix

U_1	U_{11}	U_{12}	U_{13}	U_{14}	ω_i
U_{11}	1	2	1/5	1/5	0.1168
U_{12}	1/2	1	1/3	1/3	0.1044
U_{13}	5	3	1	1	0.3894
U_{14}	5	3	1	1	0.3594
\sum	11.5	9	2.533	2.533	1.0000
CI=0.0644,CR=0.0716<0.10					

Table 4: $U_2 - U_{2k}$ Judgment matrix

U_2	U_{21}	U_{22}	U_{23}	U_{24}	U_{25}	ω_i
U_{21}	1	1	1/3	1/6	1/5	0.0594
U_{22}	1	1	1/3	1/6	1/5	0.0594
U_{23}	3	3	1	1/4	1/3	0.1399
U_{24}	6	6	4	1	2	0.4455
U_{25}	5	5	3	1/2	1	0.2988
\sum	16	16	8.677	15	0.733	1.0000
CI=0.0238,CR=0.0213<0.10						

Table 5: $U_3 - U_{3k}$ Judgment matrix

U_3	U_{31}	U_{32}	U_{33}	ω_i
U_{31}	1	1/2	1/3	0.1637
U_{32}	2	1	1/2	0.2973
U_{33}	3	2	1	0.5390
\sum	6	3.5	1.833	1.0000
CI=0.0044,CR=0.0076<0.10				

Table 6: $U_4 - U_{4k}$ Judgment matrix

U_4	U_{41}	U_{42}	ω_i
U_{41}	1	1	0.5000
U_{42}	1	1	0.5000
\sum	2	2	1.0000
CI=0.0000,CR=0.0000<0.10			

Table 7: $U_5 - U_{5k}$ Judgment matrix

U_5	U_{51}	U_{52}	U_{53}	U_{54}	U_{55}	ω_i
U_{51}	1	1/3	1/4	1	1/5	0.0688
U_{52}	3	1	1/2	3	1/3	0.1707
U_{53}	4	2	1	4	1/2	0.2695
U_{54}	4	2	1	4	1/2	0.2695
U_{55}	1	1/3	1/4	1	1/5	0.0688
\sum	14	6.667	4	14	2.233	1.0000
CI=0.0155,CR=0.0138<0.10						

By the same time, we can see that several tables, each of the consistency of judgment matrix have passed inspection,

it can be accepted. The judgment matrix obtained above were filled in the following table, And a combination of these factors combined with a company's specific situation, the evaluation results obtained various indicators, as follows:

Table 8: Evaluation of the results of the various indicators

U	An index(U_i)	Two indicators(U_{ik})	Evaluation value F_{ikj}				
			Very Good	Good	General	Poor	Very Poor
U	U_1 (0.0400)	U_{11} (0.1168)	0.10	0.65	0.25	0.00	0.00
		U_{12} (0.1044)	0.00	0.70	0.05	0.25	0.00
		U_{14} (0.3894)	0.00	0.10	0.55	0.35	0.00
		U_{14} (0.3894)	0.00	0.60	0.05	0.35	0.00
	U_2 (0.0788)	U_{21} (0.0594)	0.10	0.20	0.65	0.00	0.00
		U_{22} (0.0594)	0.20	0.10	0.70	0.00	0.00
		U_{23} (0.1399)	0.10	0.25	0.65	0.00	0.00
		U_{24} (0.4455)	0.00	0.80	0.10	0.10	0.00
		U_{25} (0.2958)	0.00	0.50	0.10	0.40	0.00
	U_3 (0.1616)	U_{31} (0.1637)	0.15	0.20	0.65	0.00	0.00
		U_{32} (0.2973)	0.00	0.70	0.15	0.15	0.00
		U_{33} (0.5390)	0.00	0.85	0.05	0.10	0.00
	U_4 (0.3598)	U_{41} (0.5000)	0.00	0.70	0.20	0.10	0.00
		U_{42} (0.5000)	0.00	0.75	0.15	0.10	0.00
	U_5 (0.3598)	U_{51} (0.0688)	0.20	0.10	0.70	0.00	0.00
		U_{52} (0.1707)	0.10	0.15	0.75	0.00	0.00
U_{53} (0.2695)		0.00	0.65	0.10	0.25	0.00	
U_{54} (0.2695)		0.00	0.55	0.35	0.10	0.00	
U_{55} (0.0688)		0.00	0.85	0.10	0.05	0.00	

From the above table can be fuzzy comprehensive evaluation, can be combined with the preceding formula level fuzzy evaluation of the results, the following table:

Table 9: Level fuzzy comprehensive evaluation results

U	U_i	Evaluation value b_{ij}				
		Very Good	Good	General	Poor	Very Poor
U	U_1	0.0177	0.5501	0.1396	0.2987	0.0000
	U_2	0.0348	0.5571	0.2453	0.1629	0.0000
	U_3	0.0246	0.6990	0.2780	0.0985	0.0000
	U_4	0.0000	0.7250	0.1750	0.1000	0.0000
	U_5	0.0308	0.6044	0.2694	0.0954	0.0000

Thereafter, the combined evaluation of the above two formulas, namely:

$$B_i = A \circ R$$

$$= (a_1, a_2, L, a_5) \circ (B_1, B_2, L, B_5)^T$$

$$= (0.0813, 0.8573, 0.0136, 0.0149, 0.0000)$$

Based on the principle of maximum membership degree can get 0.8573 for the final evaluation results.

CONCLUSION

(1) good corporate management information platform to provide a means to manage knowledge through the use of knowledge stored in the database to achieve the positioning and quickly find relevant knowledge. At the same time can also be carried out by experts and professional communication library has reached sharing and transfer of knowledge.

(2) This paper discusses the creation and development of SMEs in the knowledge management platform, knowledge management platform proposed model and the analysis and research on its main influencing factors, and ultimately come to the accumulation of factors presented in this paper are better level, so the study will examine the development of SMEs in the knowledge management platform for future deeper theory provides a good support.

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REFERENCES

- [1] Xiaolei Ying, Maoshan Qiang. *Industrial Technology & Economy*, **2006**, 10
- [2] Zhang B.; Zhang S.; Lu G. *Journal of Chemical and Pharmaceutical Research*, **2013**, 5(9), 256-262.
- [3] Richard McDermott, Carla O' Dell. *Journal of Knowledge Management*, **2001**, 5(1), 76-86.
- [4]. Peter Meso, Robert Smith. *Journal of Knowledge Management*, **2000**, 4(3), 224-236.
- [5]. Ronghua Chen. *Finance Forum*, **2004**, 3, 80-82.
- [6] Zhang B.; *International Journal of Applied Mathematics and Statistics*, **2013**, 44(14), 422-430.
- [7] Zhang B.; Yue H.. *International Journal of Applied Mathematics and Statistics*, **2013**, 40(10), 469-476.
- [8] Zhang B.; Feng Y.. *International Journal of Applied Mathematics and Statistics*, **2013**, 40(10), 136-143.
- [9] Bing Zhang. *Journal of Chemical and Pharmaceutical Research*, **2014**, 5(2), 649-659.