The Construction of Program Knowledge Management Maturity Model-individual, Team, Organization Perspective

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Abstract. With the changing of modern information technology, enterprises are taking new management techniques and means, in order to get sustainable competitive advantage. Project management and knowledge management (KM) become an effective way to gain competitive edge. Through the research, knowledge management and the maturity of the related description, project group of knowledge management maturity model is preliminary explored.

Introduction

In an increasingly competitive global economy environment, more and more enterprises take project management as an effective way to gain competitive advantage [1].With its characteristics of dynamics, flexibility, project management provides a guiding framework for enterprise change [2]and becomes more and more favourable for enterprise managers. In order to solve many poor co-ordination problems between the project and the difficulty of choosing , project group of management arises at the historic moment [3]. It becomes the important way for enterprises to carry out the strategy of organization. At the same time, in order to improve the market reaction ability and competitive advantage, the enterprise take more and more attention to the effective management of its internal and external knowledge [4].Knowledge management involves all aspects of the buiness [5]. KMMM(Knowledge management maturity model), as the new development of theory of knowledge management, depicts the evolution of knowledge management in accordance with the specific path, from the initial, disorderly state of development to the mature and orderly stages of the process[6], and becomes the effective ways to measure project group of knowledge management level and promote to improve the project group of knowledge management ability.

The Establishment of the Project Group of Knowledge Management Maturity Model

On the basis of previous scholars' study， KMMM contains several different modules [7]， in reference to the division of PMMM (project management maturity model)into different modules by Wang Liwen、Zhang Jincao [8]，and combine with the building of knowledge management maturity model by Chen Yuqing [9], the knowledge management maturity model is divided into three aspects: the content of the category, grade and dimensions, as the core and foundation to establish KMMM.

On the basis of three aspects of the model, a group of knowledge management maturity structure of the project can be established.

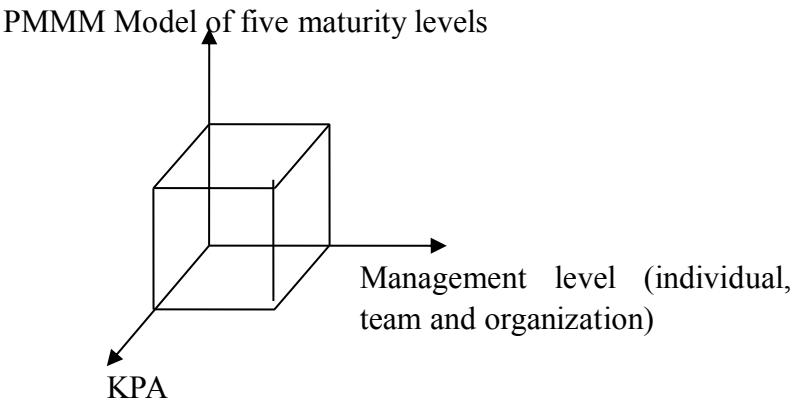

Figure 1. PMM Constructed model dimension of maturity

D - the Ternary Model of Knowledge Management. Individual, team and organization are the three basic levels of business activity, also it is on the three basic dimensions of knowledge management activities. Knowledge transmit among individuals, the project team and project organization. At the same time, it reflects the enterprise overall ability and level of knowledge management. Therefore it is necessary to build the corresponding model, from the perspective of individual, team and organization of the ternary group to study the level of knowledge management of the project.

Specific model is as follows:

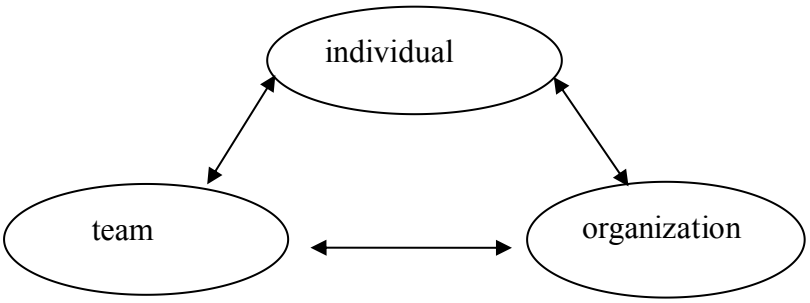

Figure 2.Project group of ternary model of knowledge management

The ternary model of knowledge management enriches the achievements of the related theory of knowledge management provides a new way for measuring the level of enterprise KM.

Analytical Model. Analysis model reveals the project group of key domain and key practices of knowledge management and indicates focus and activities. KPA refers to the main aspects of affecting project group of knowledge management performance, also, it is the main dimensions of the actual measurement.

Corresponding to each key process areas ,KPA can form a project group of knowledge management activities .

Table 1 KMMM process system

Dimension		Element	λ	β	γ
Staff A 0.2885	individual（I）	Employee willingness to share knowledge, cooperate with management; Members of the innovation and learning ability; Employee willingness to share knowledge, cooperate with management;	0.1707 0.1951	0.0493 0.0563	0.1346 0.1539
	team（T）	Senior management commitment and support for knowledge management team;	0.1533 0.1568	0.0442 0.0452	0.1426 0.1459
	organization（O）	General recognition of the value of knowledge and understanding	0.1742 0.1498	0.0503 0.0432	0.1551 0.1334
Technologycal B 0.2335	individual（I）	Employees IT capability	0.1845	0.0431	0.2335
	team（T）	Relevant knowledge, skills training on a regular basis	0.1586 0.1456	0.0370 0.0340	0.1217 0.1118
	organization（O）	formal information technology sector	0.1618 0.1812 0.1683	0.0378 0.0423 0.0393	0.0739 0.0828 0.0768
Process C 0.2080	individual（I）	Communication skills and experience	0.1798 0.1514	0.0374 0.0315	0.1129 0.0951
	team（T）	Mature process design and reengineering and continuously improve ability;	0.1798 0.1703	0.0374 0.0354	0.1068 0.1012
	organization（O）	Perfect knowledge diffusion strategies;	0.1451 0.1735	0.0302 0.0361	0.0947 0.1133
Content D 0.1286	individual（I）	The authenticity of information obtained and get instant; The authenticity of information obtained and instant;	0.1601 0.1524	0.0207 0.0196	0.0660 0.0626
	team（T）	Effective management of knowledge;	0.1662 0.1385	0.0214 0.0178	0.0701 0.0585
	organization（O）	The tightness combination of knowledge management strategy and business strategy;	0.0330 0.1108 0.1385	0.0171 0.0142 0.0178	0.0447 0.0373 0.0466

Maturity Level Determination ——the Control Model. Control model is one of the most important procedures for implementation of the project group of KMM model successfully and it can be based on the analysis of various index system of key domain model to evaluate the overall project group of knowledge management maturity level and indicate the key point of the development of the organization knowledge management. Also, it can indicate the direction for grades. Control model can be analyzed by quantitative research method.

Research method. Elements of two comparative importance rating and assignment

numerical order	importance rating	a_{ij} assignment
1	i，j equal importance	1
2	i more importent	3
3	i much more important	5
4	j more importent	1/3
5	j much more important	1/5

$a_{ij} = \{2,\ 4,\ 1/2,\ 1/4\}$ indicates the importance level among $a_{ij} = \{1,\ 3,\ 5,\ 1/3,\ 1/5\}$

（1）analysis of expert evaluation judgment matrix is as follows :

$$M = \begin{bmatrix} 1 & 1 & 2 & 2 & 4 & 4 \\ 1 & 1 & 1 & 2 & 3 & 3 \\ 1/2 & 1 & 1 & 2 & 3 & 3 \\ 1/2 & 1/2 & 1/2 & 1 & 2 & 2 \\ 1/4 & 1/3 & 1/3 & 1/2 & 1 & 1 \\ 1/4 & 1/3 & 1/3 & 1/2 & 1 & 1 \end{bmatrix}$$

（2）

$$\overline{W_1} = \sqrt[n]{\prod_{j=1}^{n} b_{ij}},\quad i, j = 1, 2...., n$$

Results: $\overline{W_1} = 2, \overline{W_2} = 1.66887, \overline{W_3} = 1.44225, \overline{W_4} = 0.89090, \overline{W_5} = 0.49028, \overline{W_6} = 0.49028$

（3）The vector normalization : $w = [w_1, w_2, w_3, w_4, w_5, w_6]T$

results: $W_1 = 0.2885, W_2 = 2335, W_3 = 0.2080, W_4 = 1286, W_5 = 0.0707, W_6 = 0.0707$

（4）The biggest feature is:

$$\lambda_{\max} = \sum_{i=1}^{n} \frac{(MW)_i}{nW_i} = 6.0521$$

（5） $CI = \dfrac{\lambda_{\max} - n}{n-1} = 0.01042$

（6）$CR = CI / RI = 0.0084$ consistency is good.Therefore, w_i is the value of the first layer of the weight of each factor.

The second layer: to affirm the target weights of the

The weight of each factor in the second layer: $\lambda_{ak} = \dfrac{1}{\sum_1^6 \overline{X_J}} \overline{X_J}$

Conclusion and Prospects

The model of KMMM provides a theoretical framework for measuring project organization level of KM . Starting from individual, team and organization, this paper builds the knowledge management consists of temary model, analysis model and control model. Through this model, measuring the level of KM in project type organization can be not only from people, technology, process but from six key domain dimensions . At the same time, the index system of measuring and the final model still need further verification in practice and become a direction of further research.

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