Research on Application of Project Management Maturity Model to Gas Pipeline Project in China

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Abstract

Gas pipeline project management has been promoted in our country for many years, but it still lacks scientific management methods and there are many problems. Project Management Maturity Model (PMMM) is mainly used to measure the effectiveness of various methods, techniques, and the use of the method. As a result, it is necessary to introduce the project management maturity model to the gas pipeline project management, to find and solve the problem in details.

Keywords

Project management; Maturity model; Gas pipeline project management.

1. Introduction

It requires not only technology, but also mature project management capabilities to ensure the whole construction process to achieve success in the construction of gas pipeline project. Therefore, project management ability is also an important aspect of the evaluation and comparison of the strength of the natural gas pipeline enterprises. Project Management Maturity Model is an important technology used in project management capability evaluation. In other countries, this technology has been widely used in various industries and enterprises. In China, this advanced technology was first used in the IT industry. However, the application of this technology in natural gas pipeline project is still in a blank state. What’s more, theoretical research is relatively weak. We are to throw away a brick in order to get a gem and inspire future research in this article.

2. The Project Management Maturity Model

The project management maturity model, as a hot topic in the project management, has attracted much attention. In 1987, Software Engineering Institute (SEI) of Carnegie Mellon University took the lead of proposing the Capability Maturity Model (CMM) from the standpoint of the software process capabilities. The successful application of CMM in the software industry inspired the experts internationally from project management fields in the heated research on and development of the maturity evaluation model of project management. As a result, there have been many valuable project management maturity models since then.1 Some of the most commonly used models are shown in Table 1. It lists the characteristics and deficiencies of several different types of project management maturity model and its application scope.

In 2003, Project Management Institute (PMI) developed Organizational Project Management Maturity Model (OPM3) which extends the measurement of project management maturity to the entire enterprise. It is regarded as the birth of the Road Research Project Management Maturity Model landmark. The model of OPM3 provides assessment to the project-oriented enterprises from the perspective of the effectiveness. It also supplies corrective actions to improve project management skills. The model structure is shown in Figure 1. It is a three-dimensional model, which the first dimension is the four step of the maturity, and the second is the nine fields of project management and the five basic processes, and the third dimension is the three level of the organization project management. The development of the OPM3 model is the birth of the joint
efforts of many global project management experts. It describes a standard for the organization's project management and its maturity. What’s more, it help users understand the organization's project management and its value in the implementation of strategic planning. OPM3 is considered to be the most authoritative organization project management maturity model.

Table 1: Commonly used Maturity mode

<table>
<thead>
<tr>
<th>The type maturity model</th>
<th>Characteristic</th>
<th>field of application</th>
<th>deficiencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMM</td>
<td>High degree of specialization</td>
<td>Software process development</td>
<td>Narrow application</td>
</tr>
<tr>
<td>(PM)²</td>
<td>Wide application</td>
<td>Higher level of project management</td>
<td>It needs a large number of complex investigation work</td>
</tr>
<tr>
<td>K-PMMM</td>
<td>High theoretical level</td>
<td>Senior Project Management</td>
<td>The assessment questions are complex and the language is too professional</td>
</tr>
<tr>
<td>PMS-PMMM</td>
<td>Wide application</td>
<td>Project driven enterprise</td>
<td>It is too abstract and less operability Index</td>
</tr>
<tr>
<td>P3M3</td>
<td>It is beneficial for the subsequent progress of planning</td>
<td>A little project Management</td>
<td>Lack of specificity</td>
</tr>
<tr>
<td>OPM3</td>
<td>Integrated and comprehensive</td>
<td>Most project Management</td>
<td>Lack of specificity</td>
</tr>
</tbody>
</table>

Figure 1. The Model of OPM3 structure diagram

3. Current situation of gas pipeline project management in our country

Gas pipeline project not only has the characteristics of general engineering projects, but also has the characteristics as large investment, long construction period, high quality requirements, large construction operation, and poor social support. These characteristics determine that the construction of gas pipeline project involves many factors. As a result, it is faced many risks which will lead to a large scale of loss. Gas pipeline project management has been promoted in our country for many years, but it still lacks scientific management methods and there are many problems.

3.1 The application of Scientific project management is still in the stage of exploration

Gas pipeline construction projects are generally large projects. Whereas some of them are national key construction projects, which are large-scale investment, long construction period and many
uncertain factors. However, many aspects of management, such as organizational structure, schedule management, quality management and cost management expose many drawbacks of the management system and management method.

3.2 The efficiency of project management is not high
Gas pipeline construction projects have mutual interference and coordination complex relationship with farmland, water conservancy, railways, roads, electricity, communications and shipping. Numerous agencies and departments are involved in the pipeline project management, therefor the efficiency of project management is not high and it is hard for the agencies to coordinate. Conflicts often occur on each target elements or convergence is not the case. At the same time, the level of the project management of construction unit is uneven. They lack scientific management methods. Therefore, it is also an important factor that increase the gas company project management difficult.

4. The necessity of applying project management maturity
The necessity of applying project management maturity to gas enterprises in China is shown as follows:

(1) It can improve the competitiveness of enterprises in the pipeline project and make them adapt to the increasingly fierce competition in domestic and international engineering contracting market as soon as possible. What’s more, it also can ensure that the market competition has more share. We can pay close attention to the essence of project management of oil and gas enterprises. It will improve enterprise market economic efficiency and market competitiveness.

(2) Combining the completed gas pipeline project to assess the future important market opportunity with OPM3 continuous improvement of project management methods to enhance the overall development of the company's maturity, we will expand the development of the enterprise space. What’s more, it will provide the basis for the future development of the three major oil companies in the relevant strategic layout, structure adjustment, improve project management.

5. Application of project management maturity model to gas pipeline project management
(1) When establishing the maturity model of gas pipeline project management, we must define the level of maturity at first and determine the maturity level of the individual assessment of objective criteria then.

(2) We can set up three dimensions of maturity model of gas pipeline project management refer to OPM3. The three dimensions contain project management maturity level, the pipeline project cycle, gas pipeline project management maturity evaluation index system of the whole life.

(3) Make empirical test and correction on inter-scorers reliability, validity and dependability of project management maturity model of gas pipeline project.

(4) Make a research on project management of gas pipeline project in oil enterprises as well as the management of the related pipeline project organization structure, the definition of responsibility and the key event flow design.

(5) Make analysis of the existing problems in the current management mode and evaluation system such as the system level, risk and process level, scope definition, the responsibility of the main body of the interface, business transfer and the transfer of the remaining issues after treatment, etc.

(6) Make an empirical Study on the evaluation index system of natural gas pipeline project management maturity.

6. Conclusion
Project management has started in China. With the vigorous development of the project management, it will promote the project management maturity concept and model of universal. The project management maturity model not only provides a method to evaluate the project management
level, but also provides the key management activities to improve the organization's project management level. We need to pay attention to that existing maturity model project management abroad is not suitable for the enterprises in China. So gas pipeline project is no exception. Therefore, it is an urgent task to build up our country's own project management maturity model.

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