

Research on the Innovation of Project Management under the Background of "Internet +"

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Abstract: The characteristics and elements of project management under the "Internet +" environment were analyzed, and the technical support and implementation process of IPD mode were improved according to the project management requirements. On this basis, a new project management mode with IPD mode as the core delivery method and building information model (BIM) technology with "Internet +" related technology as the technical support is proposed, hoping to provide some references for project management innovation.

1. Introduction

"Internet +" refers to the combination of traditional enterprises, products or services with the Internet to establish a new development mode or a new form of development by taking the Internet as a platform, making use of relevant information technology and other advantageous resources [1]. On the whole, "Internet +" represents the utilization of the advantages of the Internet in information, technology and resource integration to various fields of the economy and society, thus forming a new economic development pattern with higher efficiency. It can not only bring the innovation of production mode and sales mode, but also realize the innovation of enterprise management. This has become a top priority in project management in the new era [2-3].

2. "Internet +" Thinking

Internet thinking is more in line with the understanding and cognition of "methodology", which can also be simply summarized as "Internet +". It refers to that under the Internet technology and Internet economic environment, enterprises conform to the methods, laws and principles of the current economic trend, and apply the Internet and related advantages to the construction of various social undertakings, including enterprise management. Therefore, we need to further clarify the two characteristics of Internet thinking.

The first is "relevance". Internet thinking can only be confirmed if the Internet becomes the dominant force in society (including Internet technology and spirit). With the development of the Internet, Internet thinking is also changing, and its deconstruction and reconstruction rely on the universality of the role of the Internet in social productivity [4].

The second is "independence". In essence, "Internet thinking" is a recognition and summary of people's social development status, but it does not rely on the Internet. Every era has advanced thinking conclusions. When the level of social development reaches a certain level, it is endowed with the prefix definition of "advanced thinking" -- the development of Internet technology and the subversion of traditional industries, which promotes the concentrated outbreak of certain ideological thinking. Therefore, the expression of "Internet thinking" comes into being.

3. Project Management Elements in the Context of "Internet +"

3.1 Cultural Elements.

According to the Theory of Organizational Culture, organizational culture affects the

development and reform of project organization to a large extent, and closed organizational culture will impress the innovative spirit of project members and make them stop trying to make progress. Since the slightest mistake can go wrong, an open and inclusive organizational culture encourages members to be aggressive and rewarded for their success. Moreover, organizational culture is stable to a certain extent, and it is difficult to change once it is established [5]. For project management innovation, the most important thing is "innovation", which requires the reform of established systems and rules, especially in the rapidly changing Internet era. Therefore, without an open and progressive organizational culture, it is difficult to achieve project management innovation.

3.2 Institutional Elements.

According to the Theory of Institutional Economics, the fundamental reason for the existence of a project is that it can reduce unnecessary transaction costs by integrating internal resources and reducing negotiations. The Theory of Path Dependence holds that the choice of institution has important influence on the development of a country or unit. Studies have shown that the efficiency-centered system once promoted the rapid development of the American economy, and the lifetime employment system and the annual work sequence system have also made Japanese industries increasingly successful. Due to the influence of traditional culture and planned economy system, most of China's project management system mostly emphasizes management, and also emphasizes the use of system to restrain members. It believes that making members "docile" is good management. This institutionalized management not only severely discourages the enthusiasm of the members, but also hinders the innovation of the project.

3.3 Organizational Elements.

At present, most projects in China still adopt the traditional top-down pyramid management structure, which is not only influenced by the planned economy, but also influenced by the "official standard" and managers' desire for power [6]. On the one hand, this organizational mode makes the organizational structure more rigorous and makes the internal division of labor clear, which is convenient for managers to strengthen the control of the organization. But on the other hand, this can lead to overstaffed organization, which causes the difficulty in information transfer between the higher and the lower. This is not conducive to the exchange and transmission of information between the upper and lower levels and between departments, especially in the Internet era with large amount of information and fleeting opportunities. Moreover, this mode will seriously affect project decision-making.

4. Innovative Project Management System Based on "Internet +"

The collaborative work among the participants requires frequent information exchange, and the integrated information base of BIM will greatly improve the efficiency of information exchange, so project management in IPD mode needs to be completed based on BIM. Therefore, BIM technology is the main technical support of IPD mode. BIM technology is a tool for modeling, information integration, extraction and utilization, so information transmission and communication are not its advantage. Therefore, in the context of "Internet +", a complete technical framework based on BIM technology and "Internet +" related technology should be formed as the technical support of project management to improve the efficiency of information acquisition, collection, processing, transmission and application in the process of project management. Therefore, on the premise of making full use of advanced and feasible technologies, according to the different application scopes, it can be divided into three levels: enterprise-oriented technical support, project multi-participator-oriented technical support and industry-oriented technical support.

First, these hardware and software are purchased or developed by the enterprise itself. Hardware includes computer, server, network and other basic hardware; software includes BIM professional software, integrated project management system and big data system [7]. Due to the different functions and responsibilities of each enterprise in the construction project, the technical support they use will also be different in function.

Second, we need to buy or lease hardware and platforms including mobile terminal equipment, Internet of things terminal equipment and BIM-based IPD collaborative work platform. These technical supports are shared by all participants in the project.

Third, each enterprise or each project can use a series of platforms, including e-commerce platform, Internet financial platform, information resources sharing platform and cloud services platform; these platforms are generally operated and maintained by a third party. On the one hand, they cooperate with each other to meet the basic needs in the operation of the project; on the other hand, they ensure the efficient transmission and exchange of information among the participants; at the same time, the large amount of data in the project has been shared and recycled, and thus can play a greater value [8].

In IPD mode, the implementation process of the project is generally divided into seven stages: conceptual design, standard design, detailed design, implementation document design, institutional review, construction and delivery. In this process, the main participants in the project are identified at an early stage and are involved in each design phase. The parties use their own knowledge and experience to complete the design together to make the design results more precise and reasonable. This can effectively reduce the probability of rework and design changes in the construction phase, thus speeding up the construction progress and saving the cost of the project. Each stage of the implementation process will be improved by making full use of the above-mentioned technical support in the "Internet +" environment.

In the stages of conceptual design, standard design, detailed design, and implementation document design, as well as all kinds of data-based software and platform services provided by the new technology support architecture will replace the original inefficient face-to-face or file-dependent collaborative mode and improve the efficiency of collaborative design. In the construction stage, the new technical support framework can also provide data support and service for all kinds of problems and decisions in the construction. In addition, under the environment of "Internet +", in the delivery stage, and in addition to the traditional delivery content, the content of data delivery should also be added. In other words, all the participants of the project will integrate the data accumulated by the Party B into the large data system of Party A. For some shared project data, we should integrate them into common platform, such as information resource sharing platform for subsequent reuse [9-10]. In this way, the data flow in the technical support architecture forms a closed loop, and the project data can be recycled and accumulated, which provides more and more abundant and accurate support for the project management, including:

First, it is the standard contract. Through multiple independent contracts, single multi-party contracts, single project real-form contracts and so on, we should ensure that the interests of all parties are consistent and maintain a good cooperative relationship.

Second, it is the organizational structure. These include the three-tiered organizational structures: project decision-making committee, the project management team and the project coordinator. The aim is to ensure that the division of labor is clear and the work is coordinated.

Third, it is the implement process. This involves seven stages: conceptual design, standard design, detailed design, implementation document design, agency review, construction, project delivery and data delivery [11]. We require all major participants to participate in the design to ensure that the design results continue to improve, and data delivery enables the project data to be recycled.

Fourth, it is the technical support. This includes BIM technology and "Internet +" related technologies as the basis of a complete set of technical support framework. Our aim is to ensure the accuracy and efficiency of information integration, extraction, utilization and transmission, and to provide strong support for collaborative work.

5. Summary

"Internet +" is a new trend of social development in the future. It impacts on traditional organizational culture, organizational system, organizational structure, organizational human resources management concept. At the same time, it brings people a new kind of thinking. Namely,

it is the "Internet +" thinking. The "Internet +" thinking is not only a selective inheritance of the old way of thinking, but also a subversion of the traditional way of thinking. What it brings to project management is both an opportunity and a challenge. In this context, project management conforms to the trend of "Internet +" thinking, and constantly changes the old management ideas and management methods, as well as constantly enriches culture, system, resources and so on. Moreover, it makes the project management advance in the tide of Internet.

References

- [1] Zhou Jianliang, Li Xuewei, Liu Chunwei, Lian Jing. Research on the Project Management Model of "Internet +" BIM Home Appliances for Customer Participation[J]. Journal of Engineering Management, 2017, 31 (06): 112-117.
- [2] Tang Shengjiao. Research on the Reform of Scientific Research Management Mode in Colleges and Universities in the Era of "Internet +"[J]. Journal of Ningde Normal University (Philosophy and Social Science Edition), 2018 (01): 111-113.
- [3] Li Honggang. Application of "Internet +" in Mountain Seismic Exploration Project[J]. Journal of Jiangnan Petroleum Workers University, 2018, 31 (03): 50-52.
- [4] Jin Wenfang. Research on Innovation of Scientific Research Project Management Mode in Colleges and Universities in the Internet Era[J]. Journal of Inner Mongolia University of Finance and Economics, 2018, 16 (04): 49-52.
- [5] Ma Zhiliang, Li Songyang. New Model of Project Management in "Internet +" Environment[J]. Journal of Tongji University (Natural Science Edition), 2018, 46 (07): 991-995.
- [6] Cao Hongxing. Research on the Development of Project Management in Construction Engineering Enterprises under the "Internet +"[J]. Journal of Jiangnan Petroleum Workers University, 2016, 29 (01): 90-92.
- [7] Yu Hao, Ye Weiwei. "Internet +" Entrepreneurship and Innovation Talent Training Thinking[J]. Research on Higher Engineering Education, 2016 (03): 100-103+126.
- [8] Li Changya, Duan Zongzhi. "Internet +" Full-process Engineering Cost Dynamic Integrated Management [J]. Journal of Huaiyin Institute of Technology, 2016, 25 (03): 50-56.
- [9] Sang Peidong, Zhang Yuxuan. The Development Trend and Countermeasures of the Modernization of Construction Industry in the "Internet +" era[J]. Journal of Engineering Management, 2017, 31 (02): 23-27.
- [10] Huang Danhua. A Study on the Innovation of College English Translation Teaching Model in the Context of "Internet +"[J]. Theory and Practice of Education, 2017, 37 (15): 53-54.
- [11] Zhu Xugui, Xing Huiji. Application of Project Management Theory in "Internet + Microtourism"[J]. Journal of Luoyang Normal University, 2017, 36 (04): 19-22.