

# The Study on Engineering Management Team Cooperation Model

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**Abstract.** In the engineering project construction, the project's success or failure not only depend on fund, technology, equipment and other factors, but also depend on the project team member's cooperation who came from different professional and organized for a short time. Mobilized the project team member's initiative and sufficiently unearthed project team member's potential ensured the engineering project inexpensive, speediness and high quality finished. So the research on engineering project team cooperation had an important meaning. This paper also provided clear method and thinking to engineering project team cooperation effectively working.

**Keywords:** engineering management, team cooperation, collaborative working.

## 1. Introduction

The depth and extent of knowledge and information communication in the team cooperation relations have engineering group, and then led the different group decision and action mode. The results of the study appear, wang, s., Tjosvold d.c. and law, k s made clear, open negotiations and mutual assistance would happen some relations of cooperation, common goal. Colin Eden and flange Ackermann think effective strategic commitment and obligation transmission of team members on psychological and emotional for a large organization. The team cooperation program is to promote the dimensions, communication, such as decided to the concert, encourage, conflict and cohesion. This paper analyzed and discussed cooperation pattern, operation mechanism of engineering project team based on the team cooperation theory.

## 2. Team Cooperation Model of Engineering Management

### 2.1. The team of engineering management

American association a definition of the engineering is someone do point a one-time effort, in order to complete a unique product or service. Engineering project management and comprehensive management is a one-off. Engineering construction needs some people from different industry structure a team of enemy for a period of time, the comprehensive application professional work of economy, technology, and consistent law, etc. The project team to ensure that project is an organization effectively for the same goal, and the project manager and team members.

### 2.2. The team cooperation relation of engineering management

Due to the project team members cooperation is one-ff and temporary, the members of the team cooperation is complex, so will have the conflict and internal friction easy, therefore, the team cooperation problem of engineering project management is a very urgent task. This paper joint some people, with different professions, ability and experience, and more features the background of the text, and cooperation and team spirit is the main mode target increase one's ability than another two people's ability. The paper proposed the team cooperation relation model of engineering project management based on analyzing pattern by system theory shown as Fig.1.

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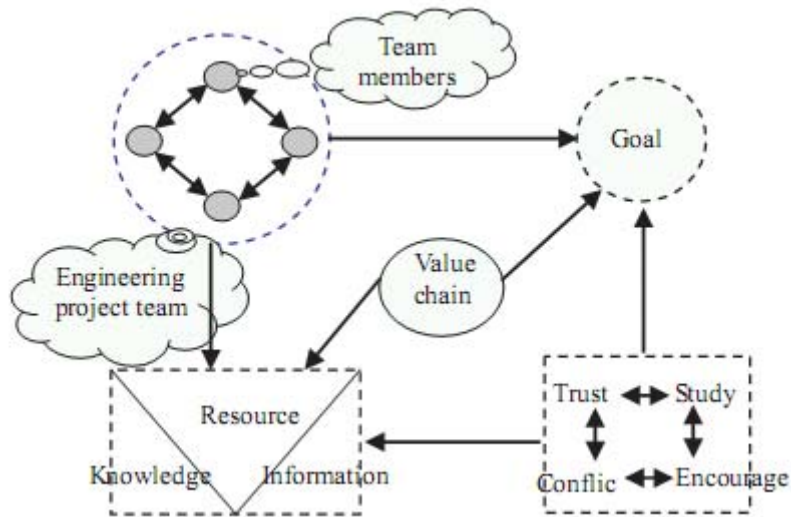


Fig. 1: The team cooperation relation model of engineering project management

In the figure, the foundation of the paper of team goal, team resources, team information and knowledge to achieve the team through the management team value chain restructuring, expressing the cooperative effect "integration system" through the management trust, team learning, team conflict and the team's encouragement. In "integration system", a group of members of the effect will magnify, total efficacy team will happen quantitative change, and then create a capacity constraint, made the efficacy of combined.

### 2.3. The team cooperation model of engineering project management

There are some research results on team collaboration in the existing literature, research content and isolated from each other, the lack of systematises. Based on the module way construct project team cooperation relations team trust, team learning, team conflict management and team incentive system theory is based on the existing research results. The cooperation model of engineering project team was shown as figure.2.

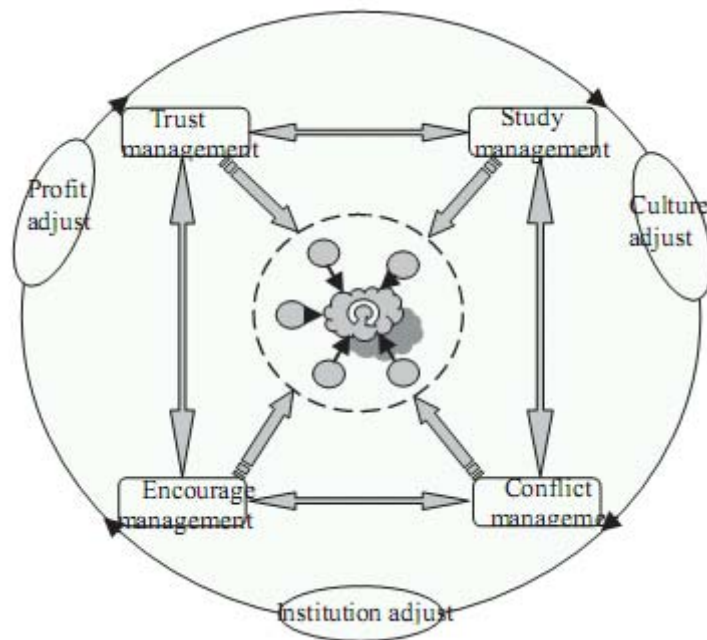


Fig. 2: The cooperation model of engineering project team

In the above chart, the cooperation model reflects engineering project team cooperation pattern, the middle of the mode is a simplified model of the project team members and restructuring of key team. In the

model, the trust management, learning management, conflict management and incentive management from platform to realize the management system elements combination again through the cultural adjustment team, adjustment and institutions adjusted profit is the power of the three motives, such as a whole and cooperation system. Management platform and the power of the three motives soft system factors engineering project team and a necessary condition of the project team. A dependent on and improve the circulation of management system components of the platform and three motive force in the project team to ensure project can flow and spread in project management, realize effective engineering project team integration system.

### **3. The Team Cooperation Motive Power of The Engineering Project Management**

#### **3.1. The culture accommodation of the engineering project team cooperation**

Culture is a soft cooperation; this is a team of the traditional carrier and knowledge. The decision of behaviour formed the internal team spontaneous order team cohesion, the impact of the project team cooperation spirit. Cultural ideas changed the team the common faith and belief of accommodation the perception of members and non-party personages and form the basis of team members admitted the club building common desire, thus forming a partnership of engineering project team based on culture accommodation. The method is as follow. First of all, we formed the values of the team, with written form formal and informal discussions, internal broadcast material, unofficial communication and other leaders of the members help and understanding, pay attention to team values. Second, at the beginning of our cultural symbol system of values and team spirit show the ceremony. Finally, we sent, and explained the team values of events and models represent personnel.

#### **3.2. The profit accommodation of the engineering project team**

The project team depends on active, positive and creative members, but the effort level members rely on profits is how much, so the profits of the key project of project team cooperation spirit. The psychology of the expectations and common reactance members of the coupling between members of experience will affect its encouragement, and then the influence of the satisfaction degree of the members.

The profit encourage play an accommodation role in engineering project team members behaviours. There were two methods of profit accommodation in engineering project management. Firstly, we built performance estimate system and salary system with many modules to bring the goal integration, resource sharing, information communication and knowledge transfer of team into team or members estimate system, and then rewarded and punished. Secondly, we designed the mutual benefit system of profit and risk sharing to urge members to carry through input and cash acceptance of cooperation, and then formed engineering project team cooperation relation based on profit accommodation.

#### **3.3. The institution accommodation of the engineering project team**

The institution was a hard cooperation and official relation among team members. The official monitoring and agreement provided framework and standard of behaviour and reduced the uncertain of team. It also pointed out to team to choose the orientation, reasonability collocated and made use of resource and ensured the team cooperation order working. So it was the foundation safeguard of team cooperation. There were many methods of team institution construction. Firstly, we should clear and definite power partition of members and its exertion condition, range and limit, and then explored the best combination pattern of goal, resource, knowledge and information. Secondly, we should build management institution of inner team to continually perfect the team goal concordance and obtain the way and rule of resource, knowledge and information. We also should put the cooperation relation in order of members. In a word, we should continually adjust and optimize the members' relation by institution accommodation to full embody the power and profit of members, and then arouse the cooperation enthusiasm of the engineering project team.

### **4. The Team Cooperation Management of Engineering Project Management**

#### **4.1. The trust management**

The well trust relation could reduce complexity and avoid uncertainty and reduce business cost and promote cooperation effect. In the engineering project management, we should form the trust relation of engineering project team by institution restraint, communication mechanism and organization authorization. Firstly, we could build the mutual benefit mechanism of profit and risk sharing of engineering project team to prevent the mutual cheat and opportunism behaviour among the team members, and then ensure to form the team trust relation based on institution. Secondly, we should establish an interaction communication pattern among members to encourage unofficial touch and mutual study among members, and then enhance the transparency of members' behaviours strategy to reduce estrangement and strangeness among members. Thirdly, we should strengthen the trust of members and team by organization authorization. In addition to this, the engineering project manager had a very important role in the trust of team, so we should strengthen the management attainments and morals accomplishment of engineering project manager.

#### **4.2. The conflict management**

According to an investigate of the USA management association, manager should spend 20% time average disposing all manner of conflicts, so we could think that the conflict was a common phenomenon. Therefore whether could solve engineering project team cooperation efficiency or not depended on how to deal with conflict management. As all we known, the low level of conflict to the disadvantage of making innovations and the overtop level of conflict also could create negative influence. Just as Amason said that conflict was a double rapier, it would have advantageous and disadvantageous influence at the same time.

In the engineering project management, firstly we should establish a conflict management beforehand mechanism to monitor and estimate the inner and outside environment of conflict, and then analyze the conflict state which the team was faced with by monitoring, distinguishing, diagnosing, evaluating and so on and take steps to control the state in time. Secondly, we should construct a communication terrace of team. We could build an effective inner communication mechanism to improve communication channel and pattern and form a formal communication terrace of project members. Thirdly, we should establish a reasonable authority structure in order to change the information agency costing which was brought by excessive concentration of powers and overtop agency costing which was brought by excessive separation of powers, and then we could put knowledge management into practice and remission inner conflict in team to defuse the disadvantageous which from conflict.

#### **4.3. The study management**

The study of engineering project team did not emerge without reasons but influenced and restricted by many factors. It was some knowledge which was obtained, stored, employed and created in the engineering project management. It also was a knowledge accumulation procedure which was progressed step by step. Nonaka and Konno mentioned the conception of "courtyard" in the SECI model and thought that the courtyard was a space of knowledge flow and conversion. The engineering project team should create on them own initiative the "courtyard" which could encourage members to study and build common wishes to lead members to continually study and promote members to interchange and share knowledge among members.

In the engineering project management, firstly, we should form encouraged restraint measures which could promote team study by building institution terrace to form better study atmosphere. Secondly, we should provide study opportunity and condition such as established project management website based on internet by establishing study terrace to provide exchange opportunity and carry out workshop and lectures for project members to augment the members' knowledge store.

#### **4.4. The encouragement management**

The engineering project team was a complex body. If we wanted effectively stimulate team proficiency and promote team performance, we should encourage engineering project team. The team encouragement included material and spirit encouragement. In the engineering project management, the core of material encouragement was reward. The reward design not only accepted the contribute from team members, but also concentrated on enhancing personal capability and team' contribute. The spirit encouragement satisfied demand of team members above the demand average by creating certain working condition to achieve deep

administrative levels, timeless and enduring encouragement for team members. The specific content included under content.

Firstly, we should foster better team atmosphere and set up the value view which was that if I help everybody, then everybody would help me. Secondly, we should build inner emotion ligament of team to enhance sense of belonging of team members. Thirdly, we should design reasonable authority structure and build corresponding team behaviour standards to promote team members mutual assistance and encouragement and stimulate working enthusiasm and create capability of team members.

## **5. Conclusion**

This paper established the cooperation system model of engineering project team and built the cooperation relation of team constituent part and team procedure and also proposed three motive powers and four management methods of engineering project team cooperation based on predecessors' research results.

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