

Implications for Self-organising in Managing Construction Projects

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Abstract: Some scholars held the idea that routinization can be the nature of project management. Nowadays, projects turn to be more complicated than before due to the increasing complexity of the communication between various actors within projects. Self-organising is pointed out to be used in managing construction projects instead of the traditional systems. This paper will mainly discuss whether self-organising is more efficient especially for the complex project. Meanwhile, three different systems: contracting system, governance system and self-organising will be simply explained. More importantly, both merits and demerits of these systems are going to be illustrated. Recommendations will be provided at the end.

Keywords: Project management; self-organising; contracting system; governance system.

1. Introduction

Some scholars held the idea that routinization can be the nature of project management [5] (Manning and Sydow, 2007). Based on their ideas, projects can be managed by contracting system (linear and sequential). In the construction projects, both contracting systems [4] (Winch, 2000) and governance systems show a sequential process [6] [7] (Morris and Pinto, 2004; PMI, 2008).

However, at present, projects turn to be more complicated than before due to the increasing complexity of the communication between various actors within projects. People used to take advantage of contracting system or governance system, which is not the most efficient method due to poor link within the communication network. In this case, self-organising is pointed out to be used instead of the traditional systems. This is because self-organising connects more on the networks. Meanwhile, Pryke (2017) indicates that there exist uncertainties in this linear process of the contracting system such as the incomplete information or the complexity of needs [10]. And he also holds the idea that if the people want to complete the project successfully, processes have to be iterative [10] (Pryke, 2017).

This paper will mainly discuss whether self-organising is more efficient especially for complex projects. Meanwhile, three different systems: contracting system, governance system and self-organising will be simply explained in the following sections. More importantly, both merits and demerits of these systems are going to be illustrated. At the end of this paper, recommendations will be provided as well.

2. Concepts

2.1. Contracting systems

Traditionally, the clients will assign the work and then sign the contact with the main contractor. And then the main contractors will look for different sub-contractors to accomplish the work (figure 1). There exist production contracts and designing contracts. Based on Winch (2000), T1 contractors are responsible for the construction work based on the provided design [4].

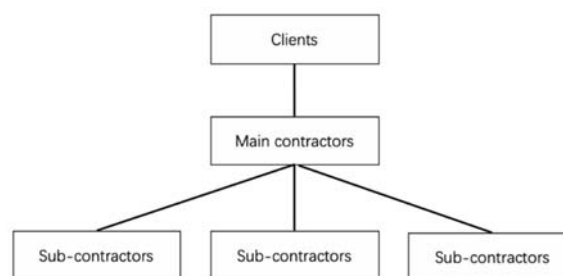


Figure 1. The relationship within the contracting system

Contracting system exists concurrently with the professional system due to the demerits evolved from professional system. Specifically, the professional system (Winch, 2000) is inefficient although it can deliver good quality buildings, however it delivers buildings expensively. Professional system (Winch, 2000) is self-regulating and self-governing. Contracting systems (winch, 2000) are unregulated and they work in the open market by competing on the lowest price [4]. PMI (2008) indicated that contracting system is a sequential system, starting with the requirements from clients, following by designing, measuring, tendering and signing the contracts with the lowest price [7]. Meanwhile, Pryke (2017) also defined that a contracting approach relied on a linear relationship: project design, project specifications, delivery on time, cost and specification constraints [10]. Moreover, Wilkinson (2006) drew the same conclusion that there are six stages in the contracting system, and they are inception, feasibility, design, tender, construction and commissioning, which is a linear process as well.

2.2. Governance systems

Project governance is defined by lots of literature. For example, Pryke (2017) stated that “project governance can be defined by, in the project, a function of the networks of relationships between different role holding actors. [10]” Besides, based on the PM-BOK, project governance refers to management approach which supports project delivery [7] (PMBOK, 2008). PMI (2008) also indicated that the project governance approach was able to be described in the project

management plan [7]. Additionally, in order to ensure the success, governance provides a comprehensive and uniform method for controlling the project [7] [1] (PMI, 2008; APM, 2006). Project managers and the project management teams determine the most appropriate method for proceeding the project, they need to make plenty of decisions, e.g. who will be involved, what resources are necessary, and what is the general approach for accomplishing the work [7] (PMI, 2008). For example, in a functional organization, there are plenty of functional departments such as marketing, human resource, operation and so on. Each department is governance by CEO or other particular organization. In this case, the communication problems between different departments will appear if there are too many departments in this organization. Meanwhile, in the matrix organization, employee is governed by both the CEO and their project manager. In this case, if both the CEO and the project manager assign the work to the same employee, and then he will be confused to determine the order of finishing the work.

2.3. Self-organising

Pryke(2017) came up with self-organising because he discovered that there existed uncertainty and associated incompleteness in the contracting system. He defined self-organising as a flexible and adaptive network [10] (Pryke, 2017). In specific, Pryke (2017) indicated that ‘self-organising’ project function-related networks were able to deal with such issues like increasing demand for information and coordination as well as high complexity tasks [8] [10] (Pauget and Wald, 2013; Pryke, 2017). Also Pryke (2017) stated that self-organising networks tended to form very fast when project actors were under pressure, for example, when they had problem in gathering and disseminating information [10] (Pryke 2017). For instance, if the contractor has problems and he is able to communicate with the designers immediately to solve the problem together. Meanwhile, in the self-organising network, clients have the ability and flexibility to make a little change of this post-contract. Pryke (2006) stated that self-organising can be regarded as the network of relationship [11]. In addition, Pryke and Smyth (2006) indicated that the governance under self-organising might get better outcomes [11].

3. Merits and demerits of Contracting and governance system

3.1. Merits

Clear directions and process

As indicated as chapter 2.1 and 2.2, contractors only need to finish the work assigned by designers or clients. Meanwhile, clear work will be assigned to different departments. For example, the design team will be only responsible for designing, and they do not need to take into account the budget or other factors. The construction team might take consider the feasibility and the finance team will take care the money. Traditional linear processes are suitable for repetitive process. The staff in different departments have clear responsibility and clear division of work. Meanwhile, its operation mode and management methods are mature. Staff used to work based on hierarchy, so they are familiar with the sequential process. For example, in the past, China Resources Land Limited set up several function departments responsible for design, finance, operations and etc. in its company. Different departments take in charge of different phases and

tasks of the projects. All departments cooperate with each other through clear division of work.

Relatively clear price plan

Contractors under contracting systems always have the clear list, this is because clients would set this list of prices for different materials. In this case, the budget is often controlled.

3.2. Demerits

Uncertainty

Tavistock Institute (1966) claimed that uncertainty was a problem and it would come from the project process [14]. For example, outside the project, the uncertainty might occur due to government or other authorities. These parties are not included in the contracts, but their decisions or commands are unpredictable. Within the project, for example, the role-holding actors may point out other requirements and issues, which needs to be satisfied or solved. In this case, uncertainty sometimes may cause changes.

High changing costs

Changing is inevitable in many cases like design phase. Meanwhile, with the development of the society, clients now are not easy to be satisfied because they have seen many excellent designs in the world online. Various requirements and needs from clients create contractors to be creative and innovative, which is good. However, changing the plan or design is quite expensive. The earlier people decide to change, the less they need to pay. As can be seen from figure 2, this figure illustrates the relationship between the Cost of Changes to the design and the ease of ability to make these changes as you move through the phases of your project [3] (A.W.Hooker, 2015). The cost of changes rises rapidly as the time goes by. Meanwhile, it is very hard and tough make changes during the construction or completion phase. Based on the data from Selver (2011): the cost will be four or five times higher than before if there is something to change during later phases [13].

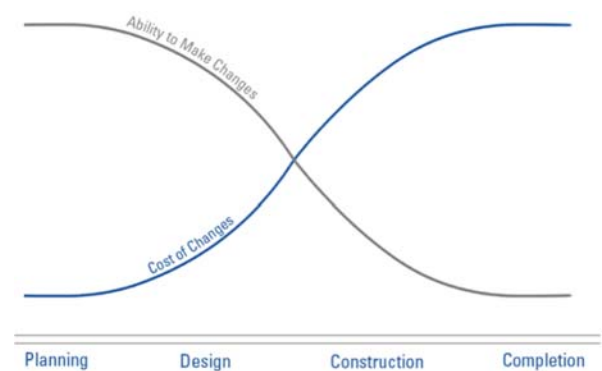


Figure 2. The relationship between the Cost of Changes to the design and the ease of ability to make these changes [3]

Iterative process

If needs or requirements from clients are too complex, this linear process in the contracting systems is easy to be iterative, which is time-costing. This is because PMI (2008) stated that an iterative relationship may cause the rework and reduce the scope control for the project [7].

4. Merits and Demerits of Self-organising

4.1. Merits

Better relationship within the industry

The first merit is that self-organising is able to improve the connections and relationships to clients and project teams. Pryke(2017) stated that this relationship is replicable, which means that these contractors this client works with now may be this client's potential collaborative as well for the next project based on high quality of finished goods[10]. In this case, this circle within this industry can be virtuous. This is because high-quality clients will look for and work with high-quality contractors. They might know before through other projects. Furthermore, this kind of virtuous relationship or work circle can improve the efficiency of working because parties are familiar with each other and hence, the quality level will increase as well.

Higher efficiency

According to Davies and his collages (2008), the self-organising is more stable, cohesive with greater adaptive capability. Meanwhile, self-organising is able to minimize the negative effects caused by iterative process, which will improve the work efficiency especially for complex projects. Complex projects now require loads of experts with professional knowledge. Contracting system is not very efficient because projects becomes more and more complex with a large number of uncertainties due to the development of techniques, the change of environment and more knowledge gained by people [10] (Pryke et al., 2017). Self-organising improves the efficiency of contracting system because it ensures the smooth information flow. When the process becomes iterative due to incomplete information or uncertainties, more time and even more money are needed to be taken and spent. The core problem brought from iterative process is that extra time needed to rework. For example, as I have indicated in section 2.3: contracting system is a sequential process and it needs to be done stage by stage. If there is one mistake or other issues occur, the following stages have to wait for this mistake is fixed. And self-organising provides the integration of stages and creates a network for members to solve the problem with the least time.

Mutual goal

APM (2012) pointed out that self-organising provides group members to hold the same goal [2]. In order to accomplish this goal successfully, these people might share knowledge and skills at most. In this case, this kind of project is easier to get a positive outcome. Pryke(2006) stated that the goal set within the self-organising team will concentrate more on the needs and feedbacks from their clients [11].

4.2. Demerits

Higher members capabilities required

The member includes in this network is able to possess many aspects of knowledge. Winch (2000) indicated that it is vital to strengthen capabilities within the network because the requirements are quite high [4]. For instance, the member in this self-organising network has to take care many functions like designing, measuring or surveying. In this case, they are better knowing many aspects of knowledge to keep the higher efficiency. Members with higher capability are easier to meet and satisfy clients' requirements. Additionally, it might take time to organize this kind of network at the first time, because members need to learn how to communicate and maximize

their abilities. Next time, if there is similar network needed, much less time will be taken.

Ambiguous plan

Pryke (2017) stated that self-organising projects do not have the clear total costs and clear process as contracting systems show [10]. Within self-organising projects, the client might point out what their overall goals are. Furthermore, other information is ambiguous. Contractors within this system have to figure out the real needs or requirements of clients. Sometimes, even the client might not be clear with this answer.

5. Change of the Management: Why Self-organising Emerges

Pryke(2006) indicated that people will change the way they manage projects, so he pointed out self-organising [11]. The main causes of self-organisation are incomplete information, increasing complexity of projects, increasing innovation and uncertainties based on a large number of projects [10] (Pryke, 2017). Linear contracting system cannot solve these issues effectively. Meanwhile, due to these issues, the processes turn to be iterative, which means that some decisions or actions have to go backward and forward. If the client changes his mind or if uncertainties emerge, working staff have to go back to the beginning or stop until the problem is solved. In this case, they have to change their plan again and again. Because the development of innovation and the increasing number of complex projects the processes become iterative, which takes a long period of time then people start to self-organise themselves to form network and solve problems.

In specific, self-organising is different from contracting system because actors are more integrated in the process. Meanwhile, for example, the designer who is integrated in the process might become a cluster leader and work with contractors [12] (Holti et al., 2000). Based on the network developed by Pryke (2006), see figure 3 [11].

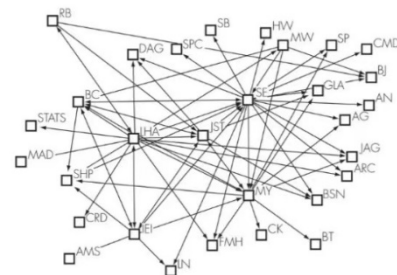


Figure 3. Relationship between actors [11]

Squares represent project actors who are integrated in this project and lines are the connection between each other. As can be found with the relationship in contracting system, the relationship between each party is high connected. Meanwhile, the change of governance mode leads to higher efficiency. This is because self-organising focuses on creating network to solve issues. Pryke (2006) stated that the transaction is governed financial incentives and information exchange. While, traditionally, staff have to report problems through the hierarchy [11].

6. Conclusion and Recommendations

In self-organising, contractors will have simpler contracts due to, for example, no specific costs or number of materials

used. Also, connections between parties in self-organising are tighter so it is easier to transfer and share knowledge with the people in this network. Staff within the network tend to get the right information for the right people with the least time. Self-organising highly improve the efficiency of working.

However, self-organising is not always the best choice for all projects. Pryke (2006) indicated that there exist entry barriers [11]. This is because, as this paper has mentioned before, members have to communicate with other members who might not be professionals in the same field. In this case, high degree of learning and understanding is needed. In this case, self-organising is a good choice with complex projects. For complex projects, members tend to build a long-term relationship. As a result, it will be easier for members to share and transfer knowledge [10] (Pryke, 2017). Pryke (2017) also mentioned that complex projects focus more on quality of services and finished goods as well as close and long-term relationship [10]. Also, clients might be professional in the construction industry or not. Pryke and Smyth (2006) stated that self-organising will be more suitable to be used by the client with little knowledge in specific field like construction [11]. Issues will raise frequently through the implementation of the project. Also, the team will consistent goal will be easier to get better outcomes with less time, so members in the self-organising team will be more efficient. In sum, self-organising is a good choice for complex projects although there exist several demerits with its network.

References

- [1] APM (2006) APM Body of Knowledge (5th Edition). High Wycombe, England: APM.
- [2] APM (2012) APM Body of Knowledge. 6th edition. Association for Project Management, London.
- [3] A.W.Hooker (2015), Cost Management, Delay & Overrun Avoidance, Procurement Advice, Why Quantity Surveyors? Available at: <https://www.awhooker.com/resources/cost-changes/>.
- [4] G. M. Winch (2000) Institutional reform in British construction: partnering and private finance, *Building Research & Information*, 28(2), pp.140-165.
- [5] Manning, S. and Sydow, J. (2007), Transforming creative potential in project networks, 339(1), pp. 20–40.
- [6] Morris and Pinto, (2004). *The Wiley guide to manage project*. NJ:Wiley.
- [7] PMI. (2004). *A Guide to the Project Management Body of Knowledge*. Newtown Square, PA: Project Management Institute.
- [8] Pauget, B. and Wald, A. (2013) Relational competence in complex temporary
- [9] Organizations, *International Journal of Project Management*, 31 (2), 190–210.
- [10] Pryke, S., (2017), *Managing networks in project-based organisations*. Wiley-Blackwell and Sons.pp.30-120.
- [11] Pryke, S. and Smyth, H. (2006) *The Management of Complex projects*, Blackwell, pp, 210-240.
- [12] Richard Holti and Davide Nicoinili., (2000). *The handbook of supply chain management*. London. pp.30-50.
- [13] Selver. (2011) Influence and cost of changes, project connections.
- [14] Tavistock Institute (1966) *Independence and Uncertainty*, pp. 60-70.
- [15] Winch, G.M. (2010) *Managing Construction Projects*. 2nd edition. Blackwell, Oxford.
- [16] Winch, G.M. (2014) Three domains of project organising. *International Journal of Project Management*, 32 (5), pp.721–731.