

Construction project teams and their development: The case in Sri Lanka

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Abstract

Construction industry is highly susceptible to be benefited from teams as the construction products are delivered by a collection of diverse professionals. However, effective teams cannot be created at a stroke, and, they need time and opportunity to mature. This is normally referred as team development; and, this area has been subjected to various researches. However, there is a deficiency in published researches on team development with regards to construction teams and none is reported in Sri Lanka. Therefore, this study explored how the construction project teams in Sri Lanka go through team development process. This research problem was approached through case studies of three construction projects, which were operating under the traditional procurement method with re-measurement contracts. Semi-structured interviews were conducted with five distinct participants of construction team during data collection. Based on findings, a new model of team development with regards to Sri Lankan construction teams was developed. The new model indicates that construction teams progress basically in a linear sequence (forming-storming-norming-performing-adjourning) as suggested in the literature. However, the study unearthed that within this basic linear sequence, several cycles can be created due to the conflicts that may occur when the team is at performing level. The results further revealed that construction teams in Sri Lanka lacking with mutual accountability; and, formal attempts to get long-term benefits.

Keywords: Construction teams, Sri Lanka, Construction Industry, Team Development

1. Background

Even though, issues on teamwork has been frequently addressed by the contemporary management researchers in a more structured way, the practice of teamwork has its roots spanned up to the very beginning of human life. For example, according to Cornick and Mather [1],

“when early man started to hunt something that was bigger than any one person could handle, he started to do it with others. The hunting party was a group with a very important common goal- to obtain food to survive.”

Various researchers have defined the term “team” in various ways. However, amongst the different definitions for team, the following given by Katzenbach and Smith [2] is one of the commonly cited:

“a team is a small number of people with complementary skills, who are committed to a common purpose, performance goals and approach for which they hold themselves mutually accountable.”

This definition by Katzenbach and Smith [1] is clear and comprehensive to an acceptable extent.

Researchers all over the world have highlighted the significance of teams in organisational perspective. Most organisations which seek improved efficiency have embraced teams in the belief that they are the way to meet the demands of a turbulent and challenging market place [3]. A research carried out by Bacon and Blyton [4] indicated that teamworking has a greater positive impact upon both organisational performance and human resource outcomes. Further, usage of teams in organisations results in increased productivity [5]. In addition, Murray and Moses [6] have stressed the idea that teams play a central role in organisational learning process.

This concept of “teamwork” is very much appropriate for the construction industry as the construction products are delivered by a collection of professionals. Various authors have highlighted the importance of teamwork in construction. In a survey of AEC (Architectural/ Engineering/ Construction) companies in the U.S., Arditi and Gunaydin [7] has identified that collaboration among parties in the design team was ranked first among the many factors that affect quality in design phase. Further, according to Albanse [8], teambuilding approaches in projects has contributed to lower the total project cost by avoiding rework; improving trust; reducing scope definition problems; lowering variation order rates; and, improving understanding of project objectives. In addition, improved teamwork in construction projects will increase the project participants’ job satisfaction [9].

Since, teams offer numerous benefits both in organisational and construction perspectives; the knowledge on how teams develop is of paramount importance for team leaders. Over the years, many researchers intended to identify how teams in general organisational perspective develop, and, offered different models to represent this process. According to Gersick [10], amongst these models, the model developed by B.W. Tuckman in 1965 is frequently cited today in management literature. According Tuckman’s model, a team has to go through four stages called **forming** (team comes together and gets the initial awareness about the each other), **storming** (conflict and the competition within the team rise to higher level), **norming** (team members try to set norms for appropriate behaviours) and **performing** (team maturing as an effective team) during its life.

Later, in 1977, Tuckman and Jenson have revised this model and proposed a new model of team development with the addition of adjourning stage which occurs after the performing stage (see Figure 1). Moreover, by addressing the issues untouched by Tuckman (1965), several other

researchers too have come up with different team development models. These models include; five faces model [11], two barriers model [12] and integrated team development model [13]. Amongst aforesaid team development models, the model of Tuckman and Jenson remains more appropriate for the construction context since, it is based on the fundamental assumption that teams has a finite life.

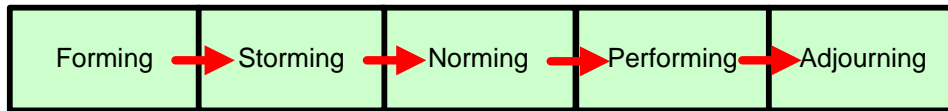


Figure 1- Tuckman-Jenson model (1977) Source: Rickards and Moger [13]

However, Winch [14], highlighted that members in construction teams are lacking with mutual accountability and a mutual objective. Some researchers have identified that the teams in construction are virtual in nature since, they have to work together from many different locations over the life of the project [1] [15]. Further, Cornick and Mather [1] and Walker [16] suggest that since, construction project teams comprises of members from different organisations, it can also be regarded as inter-organisational team. In addition, there is sufficient evidence in the literature regarding construction teams to argue that construction team is a cross-functional team [16].

When reviewing the construction related literature, it was evident that a little consideration has been given to the issues relating to team development. By looking at the characteristics of construction teams, it is evident that it deviates from the ideal team definition of Katzanbach and Smith [2]. Therefore, team development models which have been developed in general organisation perspective can not be solely applied in construction context. However, if the construction team leaders are knowledgeable about the issues relating to nature and types of teams; and, team development in construction, they are in a better position to determine what types of resources and support will be most helpful to the team, based on the specific challenges they are facing in each stage. Thus, this research intends to fill the research gap by studying how the concepts of team and team development applied in Sri Lankan construction context.

2. Method Of Study

The empirical study consisted of cases studies of three building construction projects namely projects A, B and C which are operating under the traditional procurement method with re-measurement contracts; and, whose construction duration is more than one year. Data collection was mainly done by conducting semi-structured interviews with five key participants of the construction project team: client or his representative, contractor's site manager, architect, structural consultant and the cost consultant (quantity surveyor). The data gathered from the interviews were analysed by code-based content analysis with the assistance of computer soft ware called N-vivo. In the same time, cognitive maps were developed in order to enhance the data displaying capabilities of the findings. Finally, conclusions about the overall research problem were drawn by critically analysing the findings.

3. Research Findings

The findings reveal the nature of the team; types of teams; and, team development with regards to Sri Lankan construction context. These are discussed in detail in the following sections.

3.1 Nature of the Construction Team

The nature of the construction team is discussed in terms of disciplines of the members, team leader, accountability, interdependencies, consistency of the members, and, objectives of the members as illustrated below.

Disciplines of the Members

Case studies had identified that the construction team consists of the members from various disciplines. Projects which were selected in this study were either very large projects or very complex ones. Project A and Project B has high contract sums. Project C which has the lowest contract sum (170 millions), was a very complex project. Therefore, it can be argued that these issues contributed significantly to the existence of members from various disciplines.

Team Leader

The empirical data disclosed that in construction teams, the leader's role is significantly governed by the contractual conditions. For example, the structural engineer of the project C indicated *"the leader did not have much work to do rather than just a facilitator or a coordinator. We all have obligations and responsibilities under the contract and there were penalties set up in case of breach of those obligations. Therefore, we all know what is expected from us and there was not much need for the leader to supervise us."* Therefore, it is evident that in construction teams, the leader's role was substituted by the contractual obligations up to some extent and hence, leadership positions become decreased importance.

Accountability

The case study findings revealed that in most of the situations the accountability within the team was at the organisation level. Most of the members were from different organisations and each organisation's accountability was clearly documented in the contractual conditions. Therefore, most of the time mistakes by each member were treated based on the contractual obligations. For example, the Architect from Project C stated *"since, there were several organisations, they are accountable at organisation wise. Accountability of each party is specified in the contract documents. Therefore, each member's mistake is treated based on that"*.

Interdependencies

Most of the interviewees disclosed that they have to depend on other team members to a higher extent when performing their tasks. As explained earlier, projects within the case study sample were either very large projects or very complex ones and, hence, various people with various expertises are required to handle such projects. But, the tasks of these members were interrelated and each member needs inputs from other members to carry out their functions. Therefore, higher level of interdependency among members was evident in Sri Lankan construction project teams.

Consistency of the Members

Case study data revealed that most of the construction project teams were not much consistent through out the life of the project in terms of parties. The projects selected in the study were adapting traditional (separated) procurement method. Because of that, some of the team members came into the team at various stages and even, some had completed their work and went away prior to the project completion. But, if the integrated (design and build) method was adapted some kind of consistency of parties can be expected as there is only one party to carry out both design and construction (design and built contractor), and, also due to fact that the design and built contractor is selected at early stage in the design process.

Objectives of the Members

Case study findings showed that the objectives of most of the members were inline with the project objectives. But, there were some situations where the contractors have experienced some sort of a conflict between their business objective and the project objective. When compared to the jobs undertaking by the other members the contractor's job is somewhat risky than the others. Therefore, their financial objective is quite strong and that objective sometimes found incompatible with the project objectives. The contractor's site manager from Project C explained this *"normally our main objective is to fulfill the client's requirement which is the objective of the project. We also have another objective to have a reasonable profit for the works we executed. But, there were some situations, where we felt that we were not paid enough for our work especially, during variations. In such situations, those two objectives were clashed a bit."*

3.2 Types of teams in Construction

The types of teams construction is discussed in terms virtual, cross-functional, and, inter-organisational teams.

Virtual Teams

As per the definition given by DeSanctis and Poole [17], geographically, temporally, and/or organisationally dispersion and, the communication through information and communication technologies can be seen as the main features of virtual teams.

The empirical data revealed that construction team members were from different organisations. Thus, the teams can be regarded as organisationally dispersed. Further, since most of the members were from different organisations and also they were involved in various projects simultaneously, they have to work from different locations. Therefore, team can be viewed as geographically dispersed. In addition, despite the fact that they were geographically dispersed, the team members managed to meet each other at least once a week. Therefore, those teams can also be viewed as temporarily dispersed.

Since, the construction teams were geographically dispersed; they used information and communication technologies such as telephone, E-mail and faxes to maintain communication between them. Therefore, by looking at all of above empirical findings the construction teams can be viewed as virtual teams.

Cross-functional Teams

As per Ford and Randolph [18], Cross-functional team usually works together for a limited time, team members are also members of other teams and members have reporting relationship to functional managers as well as multiple team or project leaders.

Majority of the interviewees unveiled that they were involved in various projects simultaneously. Further, due to the fact that the construction teams consisted of members from different organisations, in addition to reporting to the project leadership they also has to report to the management in their parent organisations. For example, the Quantity surveyor of the Project A indicated “In my organisation I have to report to the chairman of my organisation and in the project; I have to report to the project leader.” Therefore, it is evident that they had multiple reporting relationships.

Because of above two reasons and also due to the fact that construction teams have a finite life, the construction teams can be regarded as Cross-functional teams.

Inter-organisational Teams

Inter-organisational team refers to the team, which is made up of representatives from various organisations who are involved together in producing the results [8].

The case study findings revealed that almost all the team members were from different organisations. Further, it is obvious that those team members were drawn together to produce a result (get the project done). Therefore, the construction team can also be considered as an inter-organisational team.

Based on the findings under the sections ‘Nature of the construction team’; and ‘Types of teams in construction’, the definition for the ideal team given by Katzanbach and Smith [2] can be altered in the Sri Lankan construction context as follows.

“The construction team is a collection of two or more people with complementary skills, who come from different disciplines and organisations, to perform a common objective, but with individual objectives and, operating from different locations with multiple reporting relationships, whose accountability and leadership are significantly governed by the contractual arrangements.”

3.3 Team Development

The issues relating to team development with regards to Sri Lankan construction teams were identified by testing the Tuckman and Jenson model (1977). This model was selected after an extensive evaluation process due its high compatibility with construction teams. The ‘feelings and thoughts of the members’ and ‘observable behaviours of the members’ at different stages of team development as suggested by Tuckman and Jenson were questioned during the interviews to know about the existence of each stage.

The empirical findings disclosed that Forming and Storming stages were not experienced by the construction team members to the same extent as suggested by Tuckman and Jenson. However,

Norming, Performing and Adjourning were almost identical to the Tuckman and Jenson. The Observed feeling and thoughts of the members; and, Observable behaviours of members at each stage of team development were illustrated in Table 1 and Table 2 respectively.

The interviewees were in general agreement that aforesaid stages were incurred in sequence as Forming-Storming-Norming-Performing-Adjourning in the selected projects. They further mentioned that when the team was at the performing stage, it has undergone some conflicts. Therefore, the team was fallen again into storming stage and then has to follow the same sequence to become an effective team. This scenario has happened in several occasions and led to creation of several cycles within the team development process. For example the architect of the project A stated that *“it has this leaner sequence. But, some times when the team is functioning as an effective team it went through some conflict situations. Then it followed the same sequence to become an effective team. This created several cycles between stages.”*

Most of the members perceived that those conflicts occurred when the new team members joined the team. For example the client’s project manager of the project C stated that *“this happened mainly due to the arrival of new team members at different stages. For example, when a subcontractor joined the team at latter stages, it is very difficult to maintain coordination between them since they were not familiar with the existing way of working. It was a very significant issue in this particular project as there were about twelve subcontractors and they were responsible for almost half of the work.”*

However, some members indicated that conflicts occurred when the team is transferring from design to construction or from one trade of works to another. For example, the client’s representative of the Project B denoted *“it happened normally when the existing way of working changed. For example, when the team is transferring from design to construction stages or when scope is changing from structural work to finishes or from finishes to services.”* When the team is transferring from design to construction the contractor came into the scenario. Further, when the team is transferring from one trade of works to another such as structural to finishes or from finishes to services new subcontractors came into the team. Therefore, it can be argued that those conflicts were due to entrance of new members than any thing else.

Quite a high proportion of team members indicated that the changes to the existing scope of work such as variations also gave a reasonable contribution to such conflicts. For example, the contractor’s project manager of project B indicated that *“these conflicts were mainly arisen when the existing scope of the project changed. For example, if the client requested a huge variation, then it was difficult to rearrange the works, agreeing to a rate and agreeing for time extensions, etc. those things normally led to conflicts.”*

Table 1- Observed feeling and thoughts of the members at each stage of team development during the case studies

Stage	Forming	Storming	Norming	Performing	Adjourning
Feeling and Thoughts of the Members	<ul style="list-style-type: none"> • Optimistic and full of anticipation • Pride in being chosen for the team 	<ul style="list-style-type: none"> • Confusion and loss of interest on the team • Fluctuations in attitude about the team 	<ul style="list-style-type: none"> • Sense of belonging to a team • High confidence • Feel a new ability to express criticism constructively • Acceptance of all members in the team • General sense of trust • Assured that everything is going to work out okay 	<ul style="list-style-type: none"> • Freedom to express and contribute • High commitment • Fun, excitement and creativity • General sense of satisfaction • Continual discovery of how to sustain feelings of momentum and enthusiasm • Empathy for one another • Trusting friendships with others 	<ul style="list-style-type: none"> • Think about life after the project • Pride about your contribution for the team • Sadness about loosing relationship with the other team members.

Table 2- Observable behaviours of members at each stage of team development during the case studies

Stage	Forming	Storming	Norming	Performing	Adjourning
Observable Behaviours of Members	<ul style="list-style-type: none"> • Attempts to define tasks, processes and how it will be decided • Politeness • Orienting with others personally 	<ul style="list-style-type: none"> • Arguing among members • Differences in points of view and personal style • Lack of progress • Establishment of unrealistic goals • Concern over excessive work 	<ul style="list-style-type: none"> • Agreeing of processes and procedures • Attempts to make consensus decisions • focus and energy on tasks • Setting and achieving task milestones • Shared problem solving • developing routines • Comfort with relationships • Effective conflict resolution skills 	<ul style="list-style-type: none"> • Functioning fully as team • Clear and interdependent roles • Ability of the team members to organize themselves • Flexibility and well-functioning individually • Better understanding of each other's strengths and weaknesses and insights into group processes 	<ul style="list-style-type: none"> • Recognition and celebrating of accomplishments of team • Seeking to learn from mistakes of the team • Expressing appreciation for each other's contributions • Evaluating results • Preparing to move on

Life of the Team after Adjourning Stage

Case study findings revealed that majority of the team members were involved in various projects simultaneously. Therefore, they continued with those projects after the adjourning stage. Further, since all the team members were permanent employees in their respective organisations they were assigned to new jobs and they were engaging on those as well. Since, the team in the project B was repeatedly used in next two phases of the project B, they were

involving in those two phases. But, the members from the other two projects mentioned that there was not any formal arrangement in their projects to get long-term benefits from the team.

Based on the findings of the empirical study, Tuckman-Jenson Model (1977) has been altered in the construction context as shown in the Figure 2. This can be presented as a new model of team development with regards to Sri Lankan construction teams.

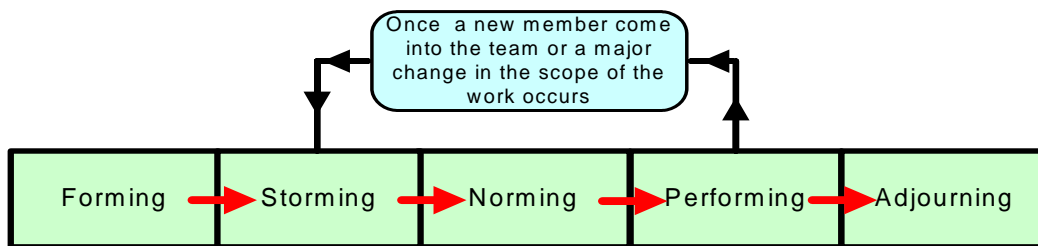


Figure 2- Revised Tuckman-Jenson Model in construction context

The model represents the cyclical nature of the team development process through the backward link from performing to storming. Conclusions drawn from this study will be discussed in the next section.

4. Conclusions

It is clear that construction teams are fairly different from the ideal teams mainly due to the lack of mutual accountability and common objective. Further, it was also evident that most of the key issues relating to construction teams such the leadership and the accountability were significantly governed by the contractual conditions. In addition, construction teams possess characteristics of virtual, cross-functional, and, inter-organisational teams.

Construction teams undergo a team development process fairly similar to the process suggested by the Tuckman and Jenson model (1977). However, the forming and storming stages are not experienced by the team members to the same extent as suggested by the Tuckman and Jenson. The basic linear sequence of the team development stages was identical with Tuckman and Jenson. But, within this linear sequence, several cycles existed due to the conflicts that occurred when the team was at performing level.

The model suggested by this study is important for construction team leaders to have better allocation of resources and leadership support for the team based on the specific challenges which the team is facing in each stage of team development.

It was also identified that progression through team development process has a strong positive relationship with the team learning. Thus, after carrying out this research it seemed appropriate that further research may focus on team learning in Sri Lankan construction context.

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