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# **Linking Team Condition and Team Performance: A Transformational Leadership**

## **Approach**

### **Abstract**

Because project teams in the construction industry shape the primary focus of the industry's project lifecycle, a high-performance construction workplace facilitates employees' technical and innovation skills through team development. Drawing on the current research in general teamwork and leadership, this study, from a theoretical perspective extends team condition as a hierarchical construct, incorporating six associated components. The paper argues that team building and team development can be studied as ongoing processes that are crucial to project success. In order to reduce the risk of common method variance the research analysis was completed using 94 construction teams from three different sources, within which team members rated their leader's transformational leadership behaviour, the team leaders evaluated the team conditions, and lastly the supervisor of each team rated the team performance. The model shows that the team condition, which is defined as the factors that contribute to make a great team has significant direct and indirect impacts on team performance. Furthermore, the transformational leadership behaviour of team leaders showed a mediating role between the team condition and the performance.

**Keywords:** team condition; team performance; transformational leadership; construction industry.

### **INTRODUCTION**

Since the early 1980's human capital plays an increasingly important role in an organisation's success (Hollenbeck et al., 2004). Particularly in a project-based organisation, the human

capitals act together to perform the work of the organisation's projects to achieve the set objectives (Guzzo and Dckson, 1996; Stott and Walker, 1995; Levenson, 2012). Consequently, productive project-based organizations are those that able to manage the personnel in groups; as a result, organisations need to be able to manage and develop teams and coordinate the individuals' skills and competencies in line with the project objectives. With that in mind, organising, managing and leading project teams are, therefore, necessary to the success of human resource management (HRM) strategies.

In the context of HRM, team building and team development are viewed as on-going processes that are vital to project success (PMBOK, 2013). Thus, robust team building and team development practices tend to be essential part of a project life cycle and also affect a companies' overall project performance. Alternatively, team working in the construction industry, as a project-based industry, mostly form the main focus throughout the project lifecycle. The changing demands of construction work, on the other hand, necessitate companies to establish different teams each and every time a new project is performed (Raiden and Dainty, 2006). Consequently, a large percentage of managers in this industry devote much of their time to some form of teamwork activities.

The evidence to date indicates that teams are capable of remarkable performance, and hence they should be given serious consideration by management of the industry (Geoghegan and Dulewicz, 2008). Schutz (1989) claims that the team "holds all the cachet of a corporate Aladdin's Lamp. With it, anything is possible". While executive managers focusing more on teamwork and its attitudes than on individuals, many organisations have indeed realised the immense benefit of teams and have both advanced their scope of operations and integrated programmes to enhance their performance. Because teams are considered to be the backbone of an organisation able to produce more and better solutions to problems than individuals can (Blanchard, 1988: 6), teamwork accomplished via joint work and interaction among individual

team members (Sundstrom et al., 1990) should be developed by team leaders. In this regard, a team leader has been perceived to be a powerful means for team development and performance (Dionne et al., 2004).

Though team building has been explored in many studies (Anantaraman, 1984; Moe et al., 2010; Molyneux, 2001; Parboteeah et al., 2015), to date, little research has disentangled how the team condition, as a consequence of team development, and the leadership style of the team leader enhance team performance in construction companies. Therefore, this study evaluates the condition of the teams, which is defined as the factors that contribute to make a great team, the leadership style of the leaders and their effects on team performance.

Since the construction industry has been evaluated as one of the most active, complex and dynamic environments (Bresnen, 1990; Loosemore et al., 2003), it raises interesting managerial issues and presents a challenging context for leadership phenomena (Bresnen, 1990; Fellows et al., 2002). From this point of view, the importance of effectual leadership and management techniques is notably apparent among the larger contractors, which in turn need to put emphasis on managing the construction teams en route for project accomplishment (Druker and White, 1995). Despite the fact that leadership is among the most significant topics in management studies, many authors have not been able to articulate the concept of leadership even with the multitude research and literature in this discipline (Geoghegan and Dulewicz, 2008; Giritli and Oraz, 2004; Tyssen et al., 2013). Particularly in the construction industry, limited number of research has been carried out on leadership trends (Odusami et al., 2003; Toor and Ofori, 2007). Dulaimi and Langford (1999) asserted that most research and scientific studies on leadership in the industry focus on looking into the personal characteristics of project managers, and there are not many studies that targeted on transformational leadership behaviour of team leaders in the industry (Toor and Ofori, 2007; Limsila and Ogunlana, 2008; Tabassi et al., 2012). Therefore, evaluating the transformational leadership behaviour of team leaders in the industry

has shaped one of the main objectives of the study.

Even though the prior work on team research has stated that there is no sole standard determinant of performance effectiveness for groups (Guzzo and Dickson, 1996; Hackman, 1990; Keller, 1986; Chi and Huang, 2014), yet and based on a broad literature review, five features for team performance evaluation were extracted and developed to apply as a scale to measure team performance in this study. In addition, a fit between the condition of the team and the transformational leadership behaviour of the team leader appears to be an important factor for teamwork success. In this study, transformational leadership represents one of the few important variables by which a team leader can directly influence team members towards better goal achievement (Chi and Huang, 2014; Dionne et al., 2004; Toor and Ofori, 2007). As a result, transformational leadership may act as a variable that affects the relationship between the condition of the team, which is defined as existence or absence of the factors that contribute to make a great team, and team performance.

This study structures team condition as an independent factor model and adopts PLS path modelling to determine the hierarchical model (Chin, 2010; Petter et al., 2007), leading to greater theoretical parsimony and lower model complexity (Akter et al., 2011; Law et al., 1998). Furthermore, with the help of PLS path modelling, this study aims to explore a hierarchical team condition with the mediating effects of transformational leadership on the relationship between team condition and team performance under a nomological network.

## **EFFECTIVE TEAM CONDITION**

The nature of a team is determined to be a group of people who are mutually accountable to perform a task and who are dynamically involved and compete with each other. A team has also been identified as being a small or large number of people with complementary skills, whose members are committed to a set target and an approach for which they are mutually

responsible (Katzenbach and Smith, 2005; Parboteeah et al., 2015). This explanation indicates that teams must be of a manageable size and that all individuals in a team must be committed to achieving the team objectives. Although it is not an easy task to arrive at a single definition of a team and teamwork, they are considered to be critical factors for project success, particularly in a project-based environment. However, in a projectised organisation, the terms “team” and “teamwork” can refer to a wide range of possibilities such as quality circles, cross-functional teams, self-managing teams, virtual teams or co-located teams. Developing effective teams is one of the primary responsibilities of every project manager, who may be provided with varying degrees of autonomy. However, the form of teamwork depends on the task specificity. For instance, a distinctive feature of teamwork on the construction line is that it features successive work actions to assemble and erect different parts of a building structure. Alternatively, where the goal is to improve the project process, teamwork is much more about complexity, communication and integrative work (Mitropoulos and Cupido, 2009; O’Leary-Kelly et al., 1994; PMBOK, 2013; Geoghegan and Dulewicz, 2008).

However, it is hard to figure out the precise conditions for effective teamwork, primarily because different types of teamwork activities are considered to be effective or ineffective based on the work requirements and situations within which the tasks are placed (Stott and Walker, 1995). Despite this variety, there are particular general conditions that continually arise from the literature on teamwork. In this regard, Anantaraman (1984, p.220) offered a condition for teamwork effectiveness and states that “an effective team would have clear, cooperative goals to which every member is committed; accurate and effective communication of ideas and feelings; distributed participation and leadership; appropriate and effective decision-making procedures; productive controversies; a high level of trust; constructive management power and conflict; and adequate problem-solving procedures.”

In addition, attributes such as initiative, trust, openness, helpfulness, flexibility, and supportiveness have been stated to be effective characteristics in teamwork environments (Kinlaw, 1991; Stevens and Campion, 1994; Lundin and Soderholm 1995). Other research on teamwork effectiveness found that different teams are more productive when the team members accept and get along with different personalities (Culp and Smith, 2001), possess a high level of self-awareness (Moriarty and Buckley, 2003), and attain productive teamwork direction and cohesiveness (Williams and Duray, 2006). In temporary organizations, such as those in the construction industry, however, teams are mainly set up around the task or around some features of it and also restricted with finite length of time. Accordingly, legitimizing the team membership for a specific duration and forming commitment based upon the project or task objectives are two approaches whereby team is formed effective (Lundin and Soderholm, 1995). In addition, Lundin and Soderholm discussed that team in temporary organizations has two angles: first, the relationship among individuals and the team and second, the relationship between team and its environment. In this particular study we placed our focus more on the former angle, since the study primarily aims to assess those variables that may come up with better relation between individuals and the team for competent performance.

Since the team condition for effective teamwork has been observed to be a multi-dimensional construct in different studies (Anantaraman, 1984; Lundin and Soderholm, 1995; Molyneux, 2001; Stott and Walker, 1995; Thamhain, 1990; Williams and Duray, 2006; Parboteeah et al., 2015), Table 1 summarises some of the criteria used to evaluate effective team condition within which existence or absence of them contribute to make a great team and have routinely emerged from other studies. However, most leaders acknowledge that condition of a team would affect group overall performance (Wang et al., 2013). Therefore:

*Hypothesis 1:* Team condition of the construction teams is positively related to team performance.

**<Insert Table 1 about here>**

Currently, due to rapid technological changes as well as the competitive global marketplace, organisations have been required to accommodate different growing factors in service and production development. These underlying conditions are based on developing a teamwork environment with strong interpersonal relationships (Cordery 2004). Accordingly, managers are required to adopt an effective set of roles and responsibilities (Arnold et al, 2000) to lead the teams. In this regard, a successful team leader combines the members' knowledge, skills and abilities to obtain outputs that are superior to the individual outcomes (Milia and Birdi, 2010). Consequently, the team leader faces a range of challenges to balance team actions and provide conditions within which the desired teamwork can be achieved (Hoegl and Gemuenden, 2001). In the Asian ethnical framework, there are few studies that evaluated the influences of different leadership behaviour in team climate (Ishikawa, 2012; Li et al., 2012). In this, Ishikawa (2012) highlighted a positive relationship between transformational leadership and team conditions. Therefore:

*Hypothesis 2:* Team condition is positively related to the transformational leadership quality of the leader.

## **LEADERSHIP AND CONSTRUCTION INDUSTRY**

The construction industry stands for one of the most dynamic and complex environments (Bresnen, 1990; Loosemore et al., 2003). These characteristics increase managerial concerns and present a challenging context for leadership trends (Bresnen, 1990; Fellows et al., 2002). From this perspective, a need for effective leadership and management practices is particularly apparent within the larger contractors, whose focus is on managing the execution process and leading different teams throughout the construction (Druker and White, 1995). While leadership has long been recognised to be a success factor for many organisations, there are



not enough empirical studies to support an association between leadership behaviour and overall success in project-based environments (Kissi et al, 2013; Müller et al., 2012). More specifically, in the construction industry, management confronts major leadership challenges such as those relating to the workforce and addressing issues such as teamwork transition, communication, conflict and interpersonal relationships (Toor and Ofori, 2007). According to Nixon et al. (2012), one of the fundamental aspects of the leadership process in the industry is to delineate how people are working together in the form of teams. Leadership is, therefore, expected to be a supportive mechanism to influence the teams' abilities in objective achievements. Therefore, it appears to be important to evaluate aspects of leadership in terms of managing project teams. In this regard, leadership behaviour, as a managerial competence, is considered to be a factor that influences individual and team performance in the workplace (Yang et al, 2011). Although the leadership process, like all management studies, must be flexible to suit the situation, in most team settings, the leader must show integrity, enthusiasm and consistency (Fryer et al., 2004). Surprisingly, Turner and Muller (2005) conducted a review on the leadership literature and asserted that due to the unique, novel, and transient nature of projects leadership has been shown to have no impact on performance. In contrast, many other studies have been conducted on the roles of leadership behaviour and the effects on the quality and success of construction projects (Naoum, 2011; Murphy and Ledwith, 2007; Yong, 2011). For instance, Naoum (2011) identified a number of situational and contextual factors that influence leadership and team behaviour in the industry. Consequently, some degree of controversy are around this topic in the literature. For that reason, this study is intended to develop further investigation to be able to find if leadership has a considerable influence on work performance as well as the overall project outcomes in the industry. From the literature review, it also appears that appropriate leadership behaviour can shape subordinates' performance in a desirable way and facilitate the smooth running of construction projects.

Hence, even more research on the concept of leadership, team condition and team performance in the construction industry seems to be necessary.

## **TRANSFORMATIONAL LEADERSHIP**

Based on the above statements, it is determined that leadership behaviour continually plays an important role in team effectiveness and productivity (Amos and Klimoski, 2014). Leaders help the team breach boundaries to build relationships and support one another, scouting for the necessary information to accomplish objectives and achieve success (Murphy and Ensher, 2008). West et al. (2003) revealed that the leaders who clarify the purpose of the project to their team members increased the performance of the team. In particular, some scholars specified the features of the leadership style affect team performance (Bish and Kabanoff, 2014; Geoghegan and Dulewicz, 2008; Murphy and Ensher, 2008). In this regard, a transformational leader has been found to promote team effectiveness (Chi and Huang, 2014; Wang et al., 2011). Transformational leaders are those who exhibit individualised consideration behaviour and have the ability to influence the subordinate's favourable reaction, which accordingly results in the employee's high performance (Geoghegan and Dulewicz, 2008). Transformational leaders aim at transforming individuals to exceed beyond the status quo with the purpose of improving the ability to innovate and adapt in the team environment. Transformational leaders may also develop particular aspects of the teamwork process such as conflict resolution, team communication, and cohesion (Dionne et al., 2004). For instance, a leader having consideration behaviour promotes both the official and a non-official communication route among team members while a leader with transactional behaviour develops only tight and official communication (Northouse, 2007). Therefore, transformational leadership may improve interpersonal relationships among team members and create better performance achievement (Geoghegan and Dulewicz, 2008). In this regard, preceding research

has proposed that transformational leadership has a constructive influence on team performance (Chi and Huang, 2014). Therefore:

*Hypothesis 3:* The transformational leadership behaviour of the team leader is positively related to the team performance of the construction teams.

Numerous studies conducted in the domain of transformational leadership (Avolio et al, 1999; Bass and Avolio, 1997; Daft, 2005; Northouse, 2007), have addressed different aspects of measuring the quality of transformational leaders. In this study, the quality of transformational leadership from the team leaders was assessed using both the English and the Malay translation of the Multifactor Leadership Questionnaire-Form 5X (Bass and Avolio, 1997, Avolio et al, 1999). Twenty items extracted from the MLQ-Form 5X were used to evaluate transformational leadership, including Idealised Attributes (IA) (charisma), Idealised Behaviours (IB), Inspirational Motivation (IM), Intellectual Stimulation (IS), and Individualised Consideration (IC). MLQ is a popular instrument, broadly applied to evaluate transformational leadership quality and “is considered the best validated measure of transformational and transactional leadership” (Ozaralli, 2003). Because there was no a priori expectation that the individual components of transformational leadership would differentially influence the relationship between team condition and team performance, the five single components of transformational leadership, which usually show high inter-correlations (Fu et al., 2010; Yukl, 2002), were combined into one higher-order construct (Hambley et al., 2007). A 5-point Likert scale (ranging from “not at all” to “a very great extent”) was also used to measure the quality of transformational leadership using the team members’ perception.

However, this study based on Woodworth's (1928 cited in Baron and Kenny, 1986) S-O-R model, which identifies that an active organism intervenes between stimulus and response formulated the following mediation hypothesis.

*Hypothesis 4:* Transformational Leadership has a mediating effect on the relationship between team condition and team performance.

### **TEAM PERFORMANCE AS THE ULTIMATE OUTCOME VARIABLE**

Traditionally, an optimum performance environment seeks to elevate the individuals' impact on the business as well as the influence of inputs, procedures, methods, the physical environment, tools and techniques that enhance the teams' triumphs (Ahadzie et al., 2008). The American Heritage College Dictionary (2007) defined the term "perform" as "to fulfil an obligation or requirement; accomplish something as promised or expected". Although the true use of the term "performance" is firmly settled in the common project management body of knowledge, the terminology typically has several connotations relying on the context wherein it is implemented. Traditionally, the term has been used to depict the activities' outcomes and to determine an individual and/or a group that is being productive (Ahadzie et al., 2008). In the construction industry, as previously mentioned, the project teams shape the focus of project execution in the industry. Therefore, the dynamic evolving nature of construction activities necessitates that organisations acquire/develop different teams anytime a new project is carried out (Raiden and Dainty, 2006). Consequently, any procedures and practices that are appointed by the organisation as a way to improve teamwork activities may deliver constructive effects on overall project performance. Nonetheless, the preceding research on teamwork has revealed that typically there is no specific standard measurement of performance effectiveness for team activities (Guzzo and Dckson, 1996). Hackman (1990) determined team performance based on three criteria: 1) the achievements of the team in connection with the quality of the task, the quantity or amount of work and customer satisfaction, 2) the implications a team has on its members, relating to the specific team members' satisfaction with belonging to the team, and 3) the potential capability of members to interact with each other in forthcoming projects and

the advancement of this capability. Based on the work of Hackman (1990), in 1999, Hirst developed a set of questions to evaluate team performance in an R&D context. Consequently, his team performance structured questionnaire scored features of team performance within a scale comprised of four items. Two items addressed whether the team had picked the appropriate course of action and strategies to fulfil project goals and the other two included whether the team had achieved goals/milestones and furnished guaranteed services to the stakeholders. The current study further developed the Hirst questionnaire by adding another item, team cohesiveness (PMBOK, 2013), to evaluate team performance in construction companies. Accordingly, the team performance questionnaire consisted of 15 questions evaluating five items, which were adopted from Hirst (1999) and PMBOK (2013). Sample items for this variable are “The teamwork has met the required standards”, “The team has chosen appropriate courses of action to meet project requirements”, “The team has developed innovative solutions to problems”, “The output of the team meets the required standard”, “The team has made sound technical decisions”, and “The output of the team has met project expectations”.

Since the study aims to find the relationship between team condition, which are the variables that could contribute to make a great team, and team performance, therefore teams that have been selected were in performing and/or adjourning stages (Rickards and Moger, 2000).

## **RESEARCH METHODOLOGY**

This study proposes that the transformational leadership approach can be a useful intervening construct to understand how the condition of a team influences team performance (Figure 1). Preceding research on transformational leadership in different industries outlined that the leader’s ability to foster cooperative goals and motivate followers to attain such goals highly influences team performance (Bass, 1985). Alternatively, Hersey and Blanchard’s situational

theory (1974) emphasises the different leadership styles of a leader based on a combination of task and relationship behaviours. Likewise, Northouse (2007) stated that “effective leaders are those who can change their own style based on the task requirements and the subordinates’ needs, even in the middle of a project”. Consequently, different team conditions may affect the transformational leadership behaviour of the leader. That is, the leaders may show different leadership quality through the different condition of their teams. However, in projectised organisation, the condition of a team influences the team efficiency along with the overall project performance (O’Leary-Kelly et al., 1994; Mitropoulos and Cupido, 2009; Stott and Walker, 1995). Nevertheless, there is not enough work on the effect of transformational leadership on the relationship between the condition of the team and team performance, particularly in the construction industry. Hence, this study evaluates the theorised model by acquiring data from three different sources: team members rated five aspects of their leader’s transformational leadership behaviour including IA, IB, IM, IS, and IC; the team leaders evaluated the team conditions, and lastly, the supervisor of each team rated the team performance based on the five items mentioned in the previous section. According to Zhang et al. (2011), this data gathering method minimises the threat of common method variance as an alternative explanation of results.

**<Insert Figure 1 about here>**

The research applies PLS path modelling to assess the hierarchical hypothesised model in Malaysian construction companies. For the purpose of data collection, three different sets of survey questionnaires were distributed among the respondents. The questionnaires were primarily based on the Likert Scale of five ordinal measures from one (1) to five (5) according to the level of importance. The team member questionnaire was comprised of three sections and assessed the respondents’ background, the leadership style of the leaders (adopted from Daft, 2005 and Northouse, 2007) and the transformational leadership quality of the team

director (MLF-Form 5X, Bass & Avolio, 1997 and Avolio et al, 1999). The team leader questionnaire consisted of two sections and evaluated the respondents' background and the attributes of team conditions (adopted from prior research such as Anantaraman, 1984; Stott and Walker, 1995; and Zhang et al., 2011). Lastly, the upper-level administration office questionnaire evaluated the team performance, which was primarily adopted from Hirst (1999).

### **Sampling**

The participants included 282 members of 94 construction project teams and their corresponding 94 team leaders, as well as 94 supervisors from the upper-level administrative office for each company at the headquarters level. The invitation letter to participate in this investigation was sent out to 800 (out of 3,000) large sized construction companies registered as grade G7 contractors under the CIDB classification of Malaysia. At the end of a six month period, 94 companies agreed to be investigated by the research officers. Five research officers were sent to companies in different locations at mega cities in Malaysia such as Kuala Lumpur, Penang, Terengganu, Johor Bahru, and Ipoh to deliver the three sets of questionnaires to the relevant respondents and to collect them for the purpose of data analysis. Three individuals by random in each team were selected to evaluate the leadership style of the team leader/director to minimise bias in the evaluation. It is worth pointing out that the team were in performing/adjourning stage and located at the headquarters of the companies. The size of these teams ranged from 4 to 12, with an average of 5.97 (SD = 2.11) and mainly consisted of the main professionals that engaged with management and administrative tasks of the projects. For all of the team members (excluding directors), 65.5 per cent were female and 34.5 per cent were male. The percentages of different races were Malay 42.9, Chinese 52.0, Indian 4.4, and other races 0.7 per cent. In addition, the level of experience for the team members in the construction industry shows that 45.5 per cent had 1 to 5 years of experience and 39 per cent had 6-10 years of experience in the industry. Regarding educational level, 70.2 per cent had a

bachelor's degree or higher, 25.4 per cent had acquired a diploma from junior colleges, and 4.4 per cent graduated from technical secondary schools. In contrast, 64.9 per cent of the team leaders were male and 70.2 per cent had 11 years or more experience in the industry. The percentages of different races for team leaders show that Malay was 37.2, Chinese 59.6, Indian 1.1, and other races were 2.1 per cent. Regarding educational level, 85.2 per cent had a bachelor's degree or higher, and the rest had graduated from junior colleges. The minimum sample size was checked and a reactive Monte Carlo analysis was performed (Chin, 1998). Accordingly, our sample size of 94 exceeded the recommended minimum of 54 deemed adequate for model testing (Green, 1991).

### **Addressing Endogeneity in the model**

It has been asserted that the problem of endogeneity can be caused by two reasons in a research model: (1) it may be happen when any bidirectional relationship is predicted among some of the constructs in the model (Abdallah et al. 2015), (2) there might be a few disregarded variables that could be also included in the controlled model in that the effect of x on y cannot be interpreted since it consists of omitted causes (Antonakis et al. 2010). Nevertheless, there are only limited studies that explicitly dealt with endogeneity in PLS models (Lovaglio & Vittadini, 2013). Based on these limited research and the assertion on probable correlations among predictors and outcomes in the explanatory equations of the PLS model that can be affected by unmodeled components in the predictor blocks, this study taken out those extra factors from the predictor blocks and fully incorporated them in the proposed model, within which endogeneity bias has been eliminated (Lovaglio & Vittadini, 2013).

### **DATA ANALYSIS**

To assess the hierarchical hypothesised model, Smart PLS was applied to determine the parameters of the model. In this case, PLS path modelling was used with a path-weighting



scheme for inside approximation (Chin, 2010; Tenenhaus et al., 2005; Wetzels et al., 2009). Afterward, nonparametric bootstrapping was applied with 500 replications to obtain the standard estimate errors (Chin, 2010). To evaluate the higher order latent variable, the method of repeated indicators was used as directed by Wold (1985), Lohmöller (1989) and Efron and Tibshiran (1993).

### **Team Condition Assessment**

The study extends existing research by conceptualising the team condition as a hierarchical, reflective construct (Hulland, 1999) and examining its relationship with the quality of transformational leadership of the team leaders and team performance. It is proposed that the team condition, determined by evaluating how the six extracted attributes, including contribution, communication, responsibility and accountability, experimentation and creativity, conflict and competition, and interpersonal relationships (see Table 1), affect team performance. Some sample questions were: “The team is prepared to air differences of opinion”, “The team likes to dream up new ways of doing things”, “Each team member is brought into discussions”, “Conflicts are defused and difference reconciled”, “Members communicate effectively with one another”, “Members are open enough to deal with sensitive issues”, “Members are open and honest with one another”, “Members don't rest on their laurels, but constantly review the team's operation”, “Members work well together”.

However, each component of the team condition assessment reflects a unique belief, while the set provides a solid foundation for hierarchical team condition modelling in a nomological network. Figure 2 shows the team condition assessment as a second order hierarchical, reflective latent variable, which is formed by connecting it to the block of underlying first order latent variables.

**<Insert Figure 2 about here>**

The degree of explained variance in this hierarchical construct was reflected in its components: that Communication (57.3%), Conflict (63.7%), Contribution (32.5%), Creativity (59.1%), Interpersonal Relationships (52.7%), and Responsibility (38.9%, see Table 2). All of the path coefficients from team condition assessment to its components were significant at  $P < 0.01$ . Here, the CR and AVE of team condition were 0.895 and 0.554, respectively, which are above the cut-off values.

**<Insert Table 2 about here>**

### **Transformational Leadership Quality**

As noted earlier, Bass and Avolio (1997) and Avolio et al. (1999) identified five dimensions of transformational leadership: Idealised Attributes (IA) (charisma), Idealised Behaviours (IB), Inspirational Motivation (IM), Intellectual Stimulation (IS), and Individualised Consideration (IC). This research used both English and Malay versions of MLQ scale to measure transformational leadership. Sample items for this variable are “My team leader shows conviction in the values”, “My team leader has a clear understanding of where we are going”, “My team leader listens carefully to the team members’ concerns”, “My team leader provides appealing images about what we can do” and “My team leader provides coaching advice for the team members’ development”. The team members were asked to rate on a 5-point Likert scale (1 = “Not at all” to 5 = “To a very great extent”) the transformational leadership quality of the leaders. The data on transformational leadership were obtained at the individual team members’ level and hence require aggregating, as the team shaped the unit of evaluation in this study. However, the aggregation needs to be validated by theoretical as well as empirical justifications (Rousseau, 1985). Whether leadership as apprehended through team members may be aggregated and used to rate transformational leadership qualities is a controversial question (Yammarino and Dansereau, 2008). According to Yammarino and Dansereau, whilst some schools of thought have contended that leadership perceptions are probably not shared

among individual team members, other scholars have declared that the homogeneous perception of leadership quality could occur because a leader is likely to treat subordinates consistently. Moreover, interaction among team members facilitates the sharing and processing of information about the team director, which is likely lead to the individuals' homogeneous perceptions of leadership quality within the team (Zhang et al., 2011). James et al. (1984) suggest the multi-item  $r_{WG(J)}$ , which is calculated as follows:

$$r_{WG(J)} = \frac{J \times \left(1 - \frac{S_k^2}{\sigma_{EU}^2}\right)}{1 + (J-1) \times \left(1 - \frac{S_k^2}{\sigma_{EU}^2}\right)} \quad \text{Eq. 1}$$

The  $r_{WG(J)}$  index applies the Spearman–Brown prophecy formula to include the number of items in the calculation of within group agreement. Thus, J is the number of items in a measure and  $S_k^2$  is the average variance of the J items in a group of k ratters.  $r_{WG(J)}$  for transformational leadership is 0.971. Although there is some argument related to the ‘cut-off’ value  $r_{WG}$  (Lance et al., 2006), these values are greater than the generally agreed upon 0.70 value. In addition, the percentage of  $r_{WG} > 0.70$  for the aggregated variable was computed and is 84 per cent. Further analysis was performed, and there were no team with a  $r_{WG}$  lower than 0.50 across the construct.

### **Measurement Model Results**

In order to examine the attributes of the measurement scales, a confirmatory factor analysis (CFA) was carried out as outlined by Chin (2010), to evaluate the reliability, convergent validity, and discriminant validity of the scales (see Tables 3 and 4). Table 3 demonstrates the results of Common Method Variance (CMV). Reported by the table, the average variance extracted (AVE) for all constructs was more than 0.5 (Fornell and Larcker, 1981), and the composite reliability (CR) of the constructs was above 0.7 (Gefen et al., 2000). As a result, CMV was not regarded to be major concern in this research. As revealed in Table 3, the majority of the item loadings were greater than 0.7 and significant at 0.01. However, the

communication items showed the lowest CR of 0.795; nevertheless, all of the values were greater than the recommended standard thresholds. The results also confirmed the convergent validity due to the fact that all indicators loaded significantly greater on their hypothesised component compared to other factors (own construct loadings were greater than cross loadings; Chin, 2010). In addition, the square root of the AVE was computed and exhibited in Table 4 to assure that the discriminant validity was greater than the inter-correlations of the construct with the other constructs in the model (Chin, 2010; Fornell and Larcker, 1981); however, there was no correlation above 0.9 observed among the constructs (Chin, 2010). Thereby, the proposed model was identified to be satisfactory, with proof of sufficient reliability, convergent validity, and discriminant validity and was authorized for testing the hypotheses and validating the research model.

**<Insert Table 3 about here>**

**<Insert Table 4 about here>**

### **Assessment of the Structural Model**

The results in Table 5 present a standardised beta of 0.479 from the team condition to team performance, 0.414 from the team condition to transformational leadership, and 0.405 from transformational leadership to team performance. Therefore, support can be located for H1, H2, and H3.

**<Insert Table 5 about here>**

### **Mediating Effects**

The mediating influence of transformational leadership on the relationship between the team condition and team performance was analysed and the results showed in Figure 3. Prior to the analysis, the criteria for mediation analysis was set up as follows: firstly, team condition as the independent variable experienced a significant impact on the mediator (transformational leadership; H2); secondly, the mediator showed a considerable influence on the dependent

variable (team performance; H3); and thirdly, the independent variable (team condition) had a significant effect on the dependent variable in the absence of the influence of the mediator (H1).

To be able to establish the mediating effect, the indirect effect of  $a \times b$  (see Figure 3) must be significant. The z statistic as suggested by Sobel (1982) was calculated, which was significant at  $p < 0.05$ . According to Hair et al (2014), if the z value exceeds 1.96 ( $p < 0.05$ ), then we will be able to accept H4, i.e., there is an indirect effect from the team condition through transformational leadership on team performance. The z value is formally defined as follows:

$$z = \frac{a \times b}{\sqrt{b^2 \times s_a^2 + a^2 \times s_b^2 + s_a^2 \times s_b^2}} \quad \text{Eq. 2}$$

$$z = \frac{0.414 \times 0.405}{\sqrt{(0.405)^2 \times (0.093176)^2 + (0.414)^2 \times (0.077137)^2 + (0.093176)^2 \times (0.077137)^2}} = 3.4$$

As shown in the figure, there was a significant effect from the team condition on transformational leadership (0.414,  $p < 0.01$ ) as well as from transformational leadership on team performance (0.405,  $p < 0.01$ ). The z value also surpasses 1.96 ( $p < 0.05$ ); thus, the ultimate result approves the mediating effect of transformational leadership on the relationship between team condition and team performance, which in turn signifies that it has an indirect influence on team performance.

To compute the dimension of the indirect effect, the variance accounted for (VAF) value was used, which signifies the ratio of the indirect effect to the total effect. The VAF value shows that 26% of the total effect of team condition on team performance is defined by indirect effect of transformational leadership.

$$VAF = \frac{a \times b}{a \times b + c} = \frac{0.414 \times 0.405}{0.414 \times 0.405 + 0.479} = 0.26$$

**<Insert Figure 3 about here>**

### **Analysis of Goodness-of-fit**

Goodness-of-fit (GoF) is expected to work in order to figure out the overall fit of the model (Tenenhaus et al., 2005). GoF is the geometric mean of the average communality (outer measurement model) and the average  $R^2$  of the endogenous latent variables. GoF suggests an index for validating the PLS model globally and intends to seek a compromise between the performance of the measurement and the structural model (Chin, 2010). As GoF is mainly depending on average communality, the GoF index is conceptually appropriate whenever measurement models are reflective (Vinzi et al., 2010). Going after the directions of Chin (2010), Vinzi et al. (2010) and Wetzels et al. (2009), the GoF value was estimated. This value acted as a threshold value for the global validation of the PLS models. Accordingly, a GoF value of 0.5520 was obtained for the main model, which exceeded the threshold value of 0.36 for large  $R^2$  effect sizes. As a result, it can be came to the conclusion that the model offers better detailing strength in comparison with the baseline values ( $= 0.1$ ,  $=0.25$ ,  $=0.36$ ). This result also gives adequate support to validate the PLS model globally (Vinzi et al., 2010; Wetzels et al., 2009).

$$GOF = \sqrt{AVE \times R^2} = 0.5520$$

## **DISCUSSION ~~AND CONCLUSION~~**

The construction industry is perceived to be one of the most dynamic and complex industrial environments by expert researchers as well as practitioners. The nature of the industry, the varying demands of construction activities, and the complexity and dynamic nature of most of the procedures as well as the processes require construction organisations to tackle project processes using teamwork. Accordingly, some of the important parameters of team condition assessment have been collected in this study from the existing literature and have been extended in the context of the construction team. The team condition assessment has been successfully framed as a second-order hierarchical construct, indicating that all dimensions

have a significant impact upon the team condition. Thus, this study contributes theoretical support for the Anantaraman (1984), Stott and Walker (1995), Thamhain (1990), and Williams and Duray (2006) studies, which identified the parameters for this study in team condition assessment as a set of practices that lead to better team performance. In another words, contribution, communication, responsibility and accountability, experimentation and creativity, conflict and competition, and interpersonal relationships are the variables that highly contributed to achieve better team performance in the construction industry.

On the flip side, the literature shows that successful team leaders are those who are able to help their team members working cohesively and acquiring the necessary support towards satisfying their personal necessities to conduct proficiently. The literature also indicates that the industry presents a challenging environment for potent administration and leadership as a result of the dynamic and fast transforming organisational, project and skill requirements. For that reason, it seems that team leaders will be able to improve the degree of teamwork achievements through implementing a relevant leadership style. In this particular study, transformational leadership has found to be a powerful tool to promote efficiency in teamwork environment. As outlined by situational theory, different team conditions may likely call for varying leadership behaviour from the team leaders. Due to this fact, the condition or the situation in that a team is performing may well affect the quality of the leadership style, mainly the transformational leadership behaviour, of the leader.

On top of that, efficacious performance and remarkable work outcomes from team members are always desired, but they fail to happen often. Individuals typically react well merely to most appropriate leadership styles and behaviour. The best style, which should be outlined based on the condition whereby a leader manage the team, would lead the members towards being productive at work. As a result, different competencies in leadership style, specifically the transformational leadership behaviour of team leader, could be possibly resulted in different

degree of team performance in the industry. Referring to the above, the research generated and tested the model to be able to evaluate the effects of the transformational leadership quality of the team leaders on the relationship between team condition, which is defined as the environment that teams are performing in, and team performance. Through this study, the team leaders evaluated the team environment based on six extracted criteria from the literature that have been highlighted in Table 1, the team members scored their leader's transformational leadership behaviour across five aspects incorporating IA, IB, IM, IS, and IC; and lastly, the supervisor of each team assessed the team performance across five related elements, which have been primarily adopted from Hirst (1999).

Accordingly, the present research extends some of the vital elements necessary to evaluate team conditions in the context of construction teams, which are at performing or adjourning stages, and generates a new model. This investigation further argues that there is no widely acknowledged definition of teams, much less team condition (Stott and Walker, 1995), and that team condition or the environment in that teams are performing is a context-dependent, multi-dimensional construct whose associated substantial dimensions depend upon the conditions, criteria and circumstances placed in different industries (Anantaraman, 1984; Molyneux, 2001; Stott and Walker, 1995; Thamhain, 1990). Thus, understanding of distinct parameters in the team condition evaluation has confirmed the extent to which construction teams display better performance in team activities. The results indicate that among all of the dimensions of team condition, conflict and competition ( $\beta=0.798$ ) is the most significant factor, followed by experimentation and creativity ( $\beta=0.769$ ), communication ( $\beta=0.757$ ), interpersonal relationships ( $\beta=0.726$ ), responsibility and accountability ( $\beta=0.624$ ), and the contribution and collaboration of team members ( $\beta=0.570$ ) in cases where evaluating the environment within which the construction teams are performing. The results of the study also show that experimentation and the creativity level of team members has a positive effect



on team performance ( $R^2=0.591$ ), which is in contrast to the findings of Hoegl and Parboteeah (2007) and in agreement with those of Kazemak (1991) and Stott and Walker (1995).

On top of that, this research has explored the distinct role of the team condition, transformational leadership and team performance in a nomological network; this role has not been put into practice adequately in the extant literature. The outcomes of the study also reveal that the team condition has a significant effect on the transformational leadership behaviour of the team leaders ( $\beta=0.414$ ), which in turn has an influence on team performance ( $\beta=0.405$ ). In this interconnection, 26% of the influence of the team condition on team performance is mediated by the transformational leadership behaviour of the leaders. This result implies that the transformational leadership behaviour of team leaders, as a mediating variable, has a major role in the relationship between the environment/condition in that the teams are working and team performance. In-line with this finding, it has also been validated that the teams' condition comes with an essential, direct impact on team performance ( $\beta=0.479$ ) together with transformational leadership behaviour ( $\beta=0.405$ ) and that both constructs explain 55.3% of the variance in team performance. For that reason, construction organizations tend to be demanded to make available a great deal better conditions for teamwork activities to be able to have both a direct and an indirect influence (through transformational leadership practices) on team performance in construction works.

Since PLS is perceived to be better matched in detailing with complex interactions and relationships (Chin, 2010) and for the reason that it also has lesser needs regarding the sample size (Urbach and Ahlemann, 2010), the application of PLS path modelling has built it feasible to test and develop the theoretical contributions of this research. By employing the technique of repeated indicators that proposed by Wold (1985) to be able to determine the higher order latent variable, this study has proven adequate dimension and structural outcomes for the

proposed research model. This study signifies that team condition assessment is a second-order reflective construct that has a significant effect on the transformational leadership behaviour of team leaders as well as team performance in a hierarchical model. The findings also confirm that the hierarchical reflective model with the mediating effects of transformational leadership can readily be predicted by using PLS path modelling. Thus, the successful application of PLS in this framework along with the mediation effects echoes Wold's idea (1985, p.589-590), "PLS comes to the fore in larger models, when the importance shifts from individual variables and parameters to packages of variables and aggregate parameters." This study has made significant contributions to knowledge and practice by proposing enhancement in team condition in the construction industry based on six criteria including contribution, communication, responsibility and accountability, experimentation and creativity, conflict and competition, and interpersonal relationships, which provides a holistic view for team leaders when the aim is building productive teams. In addition, evaluating the hierarchical team condition construct, incorporating its effect on transformational leadership behaviour, and assessing the impact of both of these factors on team performance in construction teams is the other contribution of the study in both knowledge and practice. Since prior research has not frequently explored the relationship between team condition and the transformational leadership behaviour of the leaders and their consequences on team performance, this study perhaps offers comprehensive understanding on teamwork based practices in the construction industry. On the whole, this investigation presents a practical framework by means of clarifying the particular function of team building, transformational leadership and team performance in the teams which are performing in the construction industry. The study furthermore reveals that transformational leadership has a mediating role on the relationship between team condition and the performance of teams. Likewise, the study offers an extensive theoretical contribution by featuring the research model in a new setting; that is, the team condition-

transformational leadership based leader develops a team in the context of the construction industry. Corresponding to the statement by Whetten's (1989, p.493), which is expressed that "the common element in advancing theory development by applying it in new settings is the need for a theoretical feedback loop. ... new applications should improve the tool, not merely reaffirm its utility", the current research is aimed on theoretical re-conceptualisation and methodological validation for construction teams in general. The study evaluated six extracted attributes from the literature to measure the condition of construction teams and scored their share on teamwork performance from the team leader's point of view. The results indicate that all six attributes are vital to teamwork evaluation and relatively significant in facilitating team overall performance. In addition, the importance of the team condition refers to an adequate focus on team performance and leadership behaviour of leaders. The second-order perspective of teamwork features the demand for team leaders to build and develop their teams across all dimensions, because failing to attain one dimension may act as the basis to exhaust other dimensions.

## **CONCLUSION**

In summary, the current study shows that the six extracted attributes that used-to measure the condition of construction teams are positively related to their performance. In addition, transformational leadership behaviour of team leaders is related in a positive direction with team performance across criterion used in the analysis. Moreover, transformational leadership has a mediating relationship between the environments in that teams are performing and the overall team achievements. Accordingly, transformational leadership has an augmentation effect across individual-level contextual and team-level performance. Overall, the results support this belief that transformational leaders in the construction industry lead their teams to achieve higher levels of performance. We believe that our framework adds insights into a

practical problem among the teams in the construction organizations and can be a useful tools to clarify the mechanisms linking team condition and team performance.

## **LIMITATIONS AND FUTURE RESEARCH DIRECTIONS**

The present research has some limitations that present a direction for future study. This study was conducted within construction teams in Malaysia as a specific context. Therefore, more research is required to determine how accurate the findings of this research are in other countries as well as in other industries. Furthermore, effective variables that might help clarify the predictive power of the model should be investigated in future research. Although the present research model explains 55.3% of the variance in team performance, it is probable that team efficiency could be further enhanced by integrating other additional constructs such as trust among team members in temporary organizations, which has been also highlighted by Chou et al. (2013).

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**Table 1-** Attributes of Effective Team Conditions from the Preceding Research

Attributes	Explanation	Study
Contribution	Project achievements are generally dependent on the collaboration of team members. The dynamic contribution of team members is vital to achieve project and organisational goals and objectives.	Anantaraman (1984), Burns (2002), Stott and Walker (1995), Thamhain (1990),
Communication	Procedures to accomplish tasks in a teamwork environment necessitate a great deal of interaction and communication among the individuals involved. Team members should be masters in communication skills to strengthen current and continuing project demands. Communication is considered to be an essential tool in attaining strong teamwork in assorted disciplines.	Anantaraman (1984), Molyneux (2001), Thamhain (1990), Lundin and Soderholm (1995)
Responsibility and Accountability	Responsibility and accountability create commitments amongst the team members, which would include responsibility for task achievement, team morale, and a range of other factors connected with the team's operation.	Smith (2010), Stott and Walker (1995)
Experimentation and Creativity	The experimentation and creativity level of the individuals can increase team innovation and equip the team to attain cooperative achievements.	Hoegl and Parboteeah (2007), Kazemak (1991), Stott and Walker (1995)
Conflict and Competition	Conflict is an inherent aspect of teamwork as well as part of the organisational and individual lifestyle. The reason for the frequency of conflict in the team environment may be attributed generally to the heterogeneity of individuals. The team may confront more conflict because different tasks and positions are launched, but the evidence frequently supports that heterogeneous teams carry out their assignments more efficiently compared to homogeneous teams.	Anantaraman (1984), Culp and Smith (2001), Melo et al. (2013), Zhang et al. (2011), Lundin and Soderholm (1995)
Interpersonal Relationships	The relationships among team members are an issue addressed by much of the literature on the teamwork environment. The ability of individuals to relate well to each other significantly influences team function and the potential of the team to perform successfully.	Molyneux (2001), Stott and Walker (1995), Lundin and Soderholm (1995)





**Table 3- Common Method Variance**

<b>Construct</b>	<b>Item</b>	<b>Loading</b>	<b>AVE</b>	<b>CR</b>
Communication	COMM1	0.802044	0.564461	0.795028
	COMM2	0.729313		
	COMM3	0.719868		
Conflict	CONF1	0.802991	0.615669	0.827545
	CONF2	0.807881		
	CONF3	0.741310		
Contribution	CONT1	0.827619	0.697661	0.873761
	CONT2	0.827658		
	CONT3	0.850301		
Creativity	CRE1	0.788967	0.707063	0.878352
	CRE2	0.898236		
	CRE3	0.831801		
Relationship	REL1	0.815826	0.704317	0.877106
	REL2	0.880579		
	REL3	0.819730		
Responsibility	RES1	0.782850	0.622002	0.831547
	RES2	0.789623		
	RES3	0.793503		
Team Performance	TP10	0.709211	0.528758	0.894674
	TP11	0.622007		
	TP12	0.647298		
	TP13	0.679069		
	TP2	0.695433		
	TP3	0.580147		
	TP4	0.599528		
	TP6	0.673164		
	TP7	0.642289		
TP8	0.768766			
TP9	0.634753			
Transformational Leadership	IA	0.869233	0.741153	0.934707
	IB	0.862258		
	IC	0.857080		
	IM	0.852650		
	IS	0.863267		

CR = composite reliability; AVE = average variance extracted

**Table 4-** Correlations among Constructs

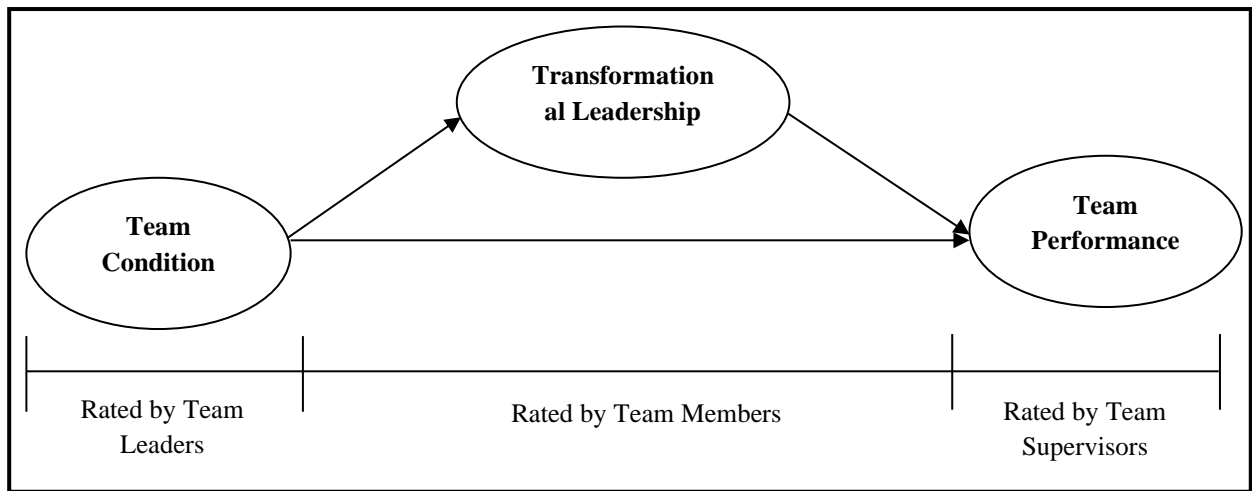
	1	2	3	4	5	6	7	8
<b>1.Communication</b>	<b>0.75131*</b>							
<b>2.Conflict</b>	0.513664	<b>0.78465*</b>						
<b>3.Contribution</b>	0.359015	0.445616	<b>0.83526*</b>					
<b>4. Creativity</b>	0.532871	0.510583	0.290113	<b>0.84087*</b>				
<b>5.Relationship</b>	0.450972	0.444118	0.197176	0.543132	<b>0.83924*</b>			
<b>6.Responsibility</b>	0.392134	0.463432	0.274990	0.286455	0.335383	<b>0.78867*</b>		
<b>7.Team Performance</b>	0.476083	0.530973	0.309663	0.394794	0.591421	0.424075	<b>0.72716*</b>	
<b>8.Transformational Leadership</b>	0.261377	0.364595	0.235993	0.240275	0.320184	0.414005	0.602699	<b>0.86090*</b>

\*Square root of the AVE on the diagonal

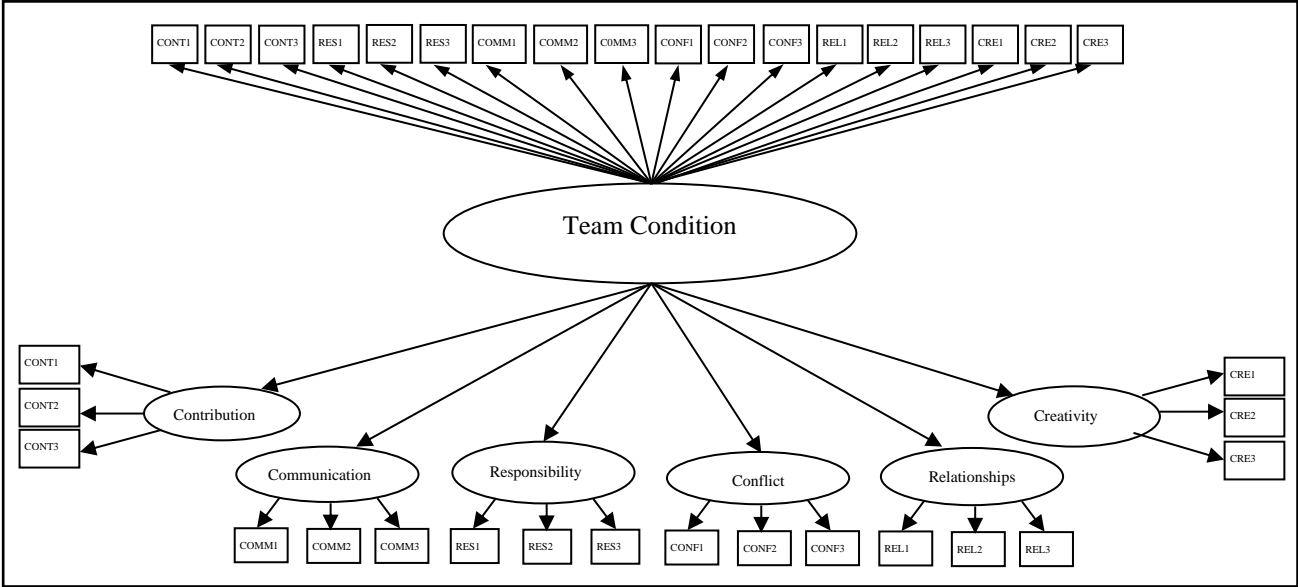
**Table 5- Total Effects**

	<b>Beta Value</b>	<b>t-value</b>	<b>P-value</b>	<b>Standard Error</b>
Team Condition -> Communication	0.757233	17.030850	*****	0.044462
Team Condition -> Conflict	0.798248	18.859685	*****	0.042326
Team Condition -> Contribution	0.569652	5.278349	*****	0.107922
Team Condition -> Creativity	0.768624	18.117455	*****	0.042424
Team Condition -> Relationship	0.725842	11.005100	*****	0.065955
Team Condition -> Responsibility	0.624075	7.868105	*****	0.079317
Team Condition -> Team Performance	0.478582	5.106551	*****	0.093719
Team Condition -> Transformational Leadership	0.414005	4.443261	0.000005	0.093176
Transformational Leadership -> Team Performance	0.404564	5.244736	*****	0.077137

**Figure 1- Hypothesised Model**



**Figure 2-** Team Condition Assessment as a Second-Order Hierarchical Model



**Figure 3-** Results of H1-H4 Testing

