RELATIONSHIPS BETWEEN LEADERSHIP ROLES AND PROJECT TEAM EFFECTIVENESS AS PERCEIVED BY PROJECT MANAGERS IN MALAYSIA

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ABSTRACT

Today, more and more project teams are formed to achieve organizational objectives as organizations generally recognized the importance and benefits of project teams. However, in order to ensure project teams perform effectively, project managers need to learn and exhibit some of the leadership roles proposed by Quinn (1988) as these roles can impact the project team effectiveness. The current study developed a research model underpinned on Cohen and Bailey (1997) team effectiveness framework, Quinn (1988) leadership roles and Hoevemeyer (1993) five criteria of project team effectiveness. Based on a sample of 201 project managers, an empirical study had confirmed that a project manager's leadership roles like mentor, facilitator, innovator and coordinator are important in influencing four out of five criteria of project team effectiveness which include team mission, goal achievement, empowerment, open and honest communication.

Keywords: Project manager, Leadership roles, Project team effectiveness, Team mission, Goal achievement, Empowerment, Open and honest Communication, Positive roles and norms.

1. INTRODUCTION

Today, many organizations are using project teams to implement products or services as well as resolve problems especially on complex tasks. The rationale is group performance through team is more effective compared to individual performance as the team outcomes exceed the sum of individual outputs (Belbin, 1993). However, achieving project team effectiveness does not come at random. Reasons prompting for studying project team effectiveness according to Hoevemeyer (1993) are four folds: (a) effective project team will improve job productivity and morale among team members, (b) effective project team frees up project manager from micro-manage day to day details so that he or she has more time focusing on other works, (c) effective project team will enable team work within and between teams so that the entire organization can function more effectively, and (d) effective project team will improve service quality and customer satisfaction.

According to Pinto (2007), a project manager's leadership should focus on effectiveness of outcomes which include team effectiveness as compared only to efficiency of operations. Duygulu and Ciraklar (2008) also found direct relationships between leadership roles and team

effectiveness in professional and non-professional organization types i.e. amateur sport clubs like football and volleyball, theatre companies as well as folk dance groups. Leadership roles like: managing diversity, forecast thinking, effective communication, building consensus, effective delegation and rewarding performance are influencing team effectiveness Duygulu and Ciraklar (2008). However, according to Chen *et al.* (2008), diversified leadership roles are indirectly influencing team effectiveness through mediators like leadership effectiveness and team trust in virtual teams of undergraduate students. From the project management literature, there is lack of research on project team effectiveness and it is unclear whether leadership roles of a project manager directly influencing project team effectiveness. According to Quinn (1988), leadership roles are categorized into eight roles which include: (a) mentor, (b) facilitator, (c) innovator, (d) broker, (e) monitor, (f) coordinator, (g) producer and (h) director. On the other hand, according to Hoevemeyer (1993), project team effectiveness consists of five measurement criteria including: (a) team mission, (b) goal achievement, (c) empowerment, (d) open and honest communication, and (e) positive roles and norms. Project management literature is generally silent on how those leadership roles are influencing the five measurement criteria of project team effectiveness. Problem statement of this study is the lack of theoretical understanding and empirical finding on how leadership roles are influencing project team effectiveness in a multi-racial and multi-cultural Malaysia. Malaysia is also the location of the study due to the availability of respondents / project managers that the author can gain access.

Research objective for this study is to evaluate how leadership roles are influencing project team effectiveness as perceived by the project managers in Malaysia. Research questions for this study include: (a) what are the leadership roles that are significantly influencing each criteria of project team effectiveness? (b) which is the most common leadership role that Malaysian project managers are adopting? (c) which is the least practised leadership role among project managers in Malaysia? Knowledge contribution from this study includes: (a) provides an understanding on what are the leadership roles that are positively influence project team effectiveness in a Malaysia context, and (b) enable management and project managers to promote and focus on the right leadership roles in order to achieve the specific criteria of project team effectiveness.

2. LITERATURE REVIEW
2.1. Project Manager's Leadership Roles

From literature on project manager's leadership styles, studies have shown that a project manager's leadership style did impact his or her perception of success in different situations instead of directly impacting project success itself (Turner and Muller, 2005). According to Geoghegan and Dulewicz (2008), eight leadership dimensions of project managers were found to be significantly related to project success but not to project team effectiveness. Furthermore, in a project management realm, being task-oriented is the preferred leadership style rather than having people-oriented leadership style (Turner and Muller, 2005). According to Turner and Muller (2005), different project leadership styles are appropriate at different project life-cycle as well as for different multi-cultural projects. Even though Turner and Muller (2005) had conducted a very thorough literature review on project manager's leadership theories and styles

which include: Trait School, Behavioral or Style School, Contingency School, Visionary or Charismatic School, Emotional Intelligence School, Competency School, Behavioral of Team Members and others, there was no review on Behavioral Complexity in Leadership (BCL). Project management literature is generally silent on BCL but other leadership theories like Transactional Leadership (Neuhauser, 2007) and Transformational Leadership (Prabhakar, 2005) had been discussed and shown that they had influence over project success but not project team effectiveness.

Behavioral Complexity in Leadership (BCL) theory explains that effective leaders will equip and perform various leadership roles and opposing behaviors simultaneously when confronted with complex and fast changing environments (Denison *et al.*, 1995). Opposing behaviors refer to competing or contrasting behaviors like creative and routine, strict and lenient and others. These various leadership roles and opposing behaviors are extracted from a repertoire of roles and behaviors which grew over time and affected by the experiences of the leaders. More roles and behaviors that a leader can display in a particular situation, more effective is the leader. Effective leaders are capable in identifying the needs of his followers within a particular situation and he or she will adjust, behave or perform the roles that will meet those needs. According to Yukl (2010), BCL theory is not new but it is still evolving whereby it has emerged in recent years as a new approach to conceptualize leadership.

In this study, BCL theory is adopted instead of other leadership theories because only BCL theory focuses on the complexity and contradiction of a leader's behaviors whereby the simultaneous and various opposing roles and behaviors of the leader enable him or her to deal with different complex situations more effectively (Denison *et al.*, 1995). On the other hand, in more traditional leadership theories, situation is presented and leadership style is displayed in an absolute "either or" manner e.g. either Theory X or Theory Y, autocratic or democratic, task oriented or relationship oriented, autocratic or democratic, transactional or transformational subject to a particular situation (Denison *et al.*, 1995). Displaying the right leadership style in a right situation shows effective leadership. In today's complex and rapidly changing environment e.g. in situations whereby multiple objectives are contradicting each other, traditional leadership theories might not be as effective as BCL theory in handling different complex situations at the same time e.g. a project may need to be completed at much lower cost, shorter duration and higher quality than previously agreed. In such situations, BCL leaders will display multiple leadership roles to handle the situation more effectively.

From literature, there are numerous theories about leadership roles. Some researchers had proposed what should be the leadership roles and complex behaviors in the repertoire of a leader e.g. Mintzberg's ten leadership / managerial roles which can be classified into (a) decision making related, (b) information processing related; and (c) interpersonal contact related (Mintzberg, 1973). Jessup (1990) proposed that leadership roles should include (a) advisor, (b) administrator and (c) coach. According to Stephen (1998), leadership roles consist of 13 sub-dimensions which include: (1) coaching, (2) effective communication, (3) encouraging teamwork, (4) establishing high standards, (5) effective delegation, (6) rewarding performance, (7) developing and releasing employees, (8) building consensus, (9) supporting reasonable risk taking, (10) forecast thinking,

(11) improving the organization, (12) managing diversity, and (13) overall effectiveness. Gunnar and Torodd (1999) also suggested that various leadership roles can be categorized into four main roles i.e. (a) producer, (b) administrator, (c) integrator and (d) entrepreneur. Nevertheless, Quinn (1988) model is adopted in this study as its leadership roles are well-known, well-balanced (i.e. encompasses internal, external, flexibility and control dimensions) and attracted the most citations (Quinn, 1988; Denison *et al.*, 1995; Chen *et al.*, 2008; Wakefield *et al.*, 2008; Zafft *et al.*, 2009).

Quinn (1988) proposed a model of leadership roles which consists of eight roles namely, facilitator, mentor, innovator, broker, producer, director, coordinator and monitor. These eight roles are spread over 4 quadrants (or sometimes also called profiles) in which each quadrant consists of two roles that are very close in terms of role's attributes versus roles in other quadrants (see Figure 1 below). The four quadrants are: 1) Relating to People, 2) Leading Change, 3) Producing Results and 4) Managing Processes. These four quadrants are divided by both x- and y-axis in which x-axis continuum consists of two extreme dimensions i.e. focus on internal or external environment. Y-axis continuum consists of highly flexible or highly controlled or stable environment. Each role consists of opposing attributes compared to the role that is located on the opposite side e.g. mentor role attributes are opposite against the director role attributes; likewise facilitator role is opposite against the producer role. All the eight roles are defined as per Table 1 below.
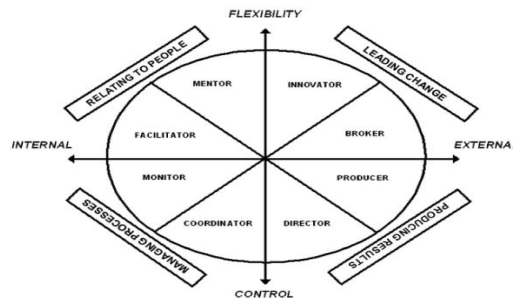
Figure-1. Quinn Model of Leadership Roles (Quinn, 1988)

Table-1. Leadership Quadrants and Role Descriptions (Quinn, 1988)

Quadrant	Leadership Role
Relating to People (RP)	• Mentor: Acknowledges personal needs, develops people, caring, empathetic.
	• Facilitator: Acknowledges personal needs, develops people, practices participation and teambuilding, focuses on consensus building, manages conflict and encourages participative decision-making.
Leading Change (LC)	• Innovator: Inspires, anticipates customer needs, initiates significant changes, new ideas, experiments, problem solves, adaptable.
	• Broker: Same functions as innovator including, sells ideas, influences decisions at higher levels, acquires needed resources, strong negotiator.
Managing Processes (MP)	• Monitor: Clarifies policies, expects accurate work, controls projects, monitors progress, develops measures and checkpoints.
	• Coordinator: Same functions as the monitor including brings order, plans schedules, provides stability, control and continuity.
Producing Results (PR)	• Producer: Focuses on outside competition, emphasizes speed, hard work ethic, motivates people, initiates action.
	• Director: Same functions as producer including providing clear direction, clarifies priorities, communicates the vision, plans and prioritizes.

Quinn's Model of Leadership Roles explains that a more effective leader will be able to cover more roles e.g. three to four quadrants of roles in his or her repertoire versus a less effective leader who may only have one to two quadrants of roles. All the roles covered by a leader co-exist simultaneously within the leader but when facing different situations, certain roles will be demonstrated highly while some opposite roles will be retracted to a minimum degree. In this study, Leadership Roles are being defined as the collection of eight roles which includes facilitator, mentor, innovator, broker, producer, director, coordinator and monitor that an effective project manager can demonstrate appropriately in a complex and rapidly changing environment (Denison et al., 1995). There were studies done on how BCL theory had influenced Team Conflict and Team Trust (Chen *et al.*, 2008; Wakefield *et al.*, 2008) but there is still lack of research on whether BCL theory will also influence Team Effectiveness. In the Malaysian context, despite the numerous studies conducted on leadership, there is no conclusive evidence showing the more widely practiced leadership styles (Lo *et al.*, 2010). Moreover, none of them is evaluating how BCL theory is influencing constructs such as Team Effectiveness in a project team setting.

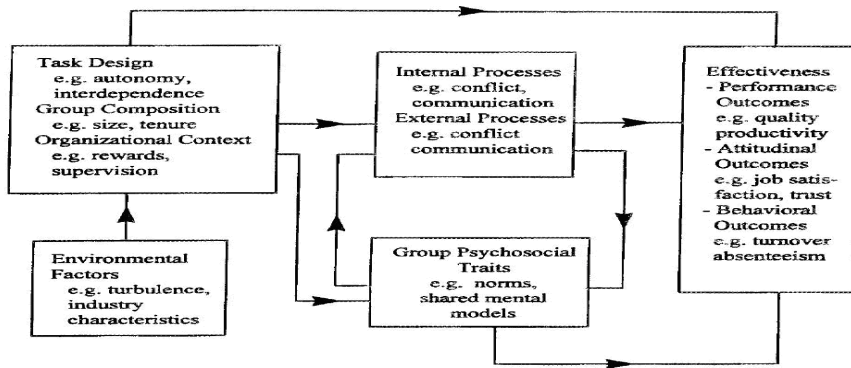## 2.2. Project Team Effectiveness

There are differences among the terms teamwork, team effectiveness and team performance whereby they are sometimes being used interchangeably. According to Andrews (2012), teamwork refers to a result yield from a set of competencies (e.g. adaptability, team orientation) displayed by team members who worked together in achieving a common goal. Team effectiveness encompasses external factors (e.g. quality, quantity) and internal factors (e.g. team viability) that determine how well the team works as a unit (Andrews, 2012). Lastly, team performance emphasizes on the results achieved by the team regardless of any mitigating factor (Andrews, 2012).

From literature, team effectiveness is defined differently by different researchers. According to Hoevemeyer (1993), Bourgault *et al.* (2008), criteria of team effectiveness include team mission, goal achievement, empowerment, open and honest communication, and lastly positive roles and norms. Other researchers defined team effectiveness criteria to include: productivity, satisfaction and manager judgements (Campion *et al.*, 1996); performance outcomes e.g. quality and productivity, attitudinal outcomes and behavioral outcomes (Cohen and Bailey, 1997); quality of work, efficiency of team operations, user interaction effectiveness, adherence to schedule and budgets, and amount of work the team produced (Jiang *et al.*, 1997); team performance and attitude (Kuo, 2004); team productivity, team social processes and individual wellbeing (Wageman *et al.*, 2005); team performance and satisfaction (Chen *et al.*, 2008); team performance, team member satisfaction, and viability of the team to continue (Kozlowski and Ilgen, 2006); leadership effectiveness, team organization, team behaviors, team results and team learning (Andrews, 2012). Most of the criteria of team effectiveness encompass team performance (inclusive productivity, quality of work and team results) whereby team performance is different from team effectiveness (Andrews, 2012). Only team effectiveness criteria from Hoevemeyer (1993) and Bourgault *et al.* (2008) are excluded team performance. Moreover, their team

effectiveness criteria are covering the higher and wider spectrum of team mission and goal achievement.

Key factors for team effectiveness are different from team effectiveness criteria whereby the former refer to what are the key factors contributing to team effectiveness whereas the latter refer to what are the measurement criteria to define team effectiveness. From literature, some team effectiveness models depict the key factors contributing to team effectiveness. These include Campion *et al.* (1996), Cohen and Bailey (1997), Kuo (2004), Kozlowski and Ilgen (2006), Chen *et al.* (2008) and Andrews (2012) models. However, Cohen and Bailey (1997) team effectiveness framework depict the possible direct relationship between supervision / leadership roles and team effectiveness whereas other team effectiveness models are rather silent on this relationship. In order to study how leadership roles are influencing project team effectiveness, a research model is developed underpinning on Cohen and Bailey (1997) Team Effectiveness Framework as depicted in the following Figure 2:

Figure-2. Team Effectiveness Framework (Cohen and Bailey, 1997)

The above framework illustrated that design factors are having direct impact on team effectiveness outcomes as well as indirect impact on team effectiveness outcomes through group processes and psychosocial traits. Both group processes and psychosocial traits are also correlated with each other. At the same time, environmental factors have a direct influence on design factors. Altogether, environmental factors, design factors, group processes and group psychosocial traits can predict team effectiveness outcomes. Within the organizational context of design factors (see Figure 2), supervision is one of the items that can influence both group processes and group psychological traits. In project management context, supervision is a form of leadership duty that a project manager needs to perform in order to ensure that the project is progressing onto the right direction (Pinto, 2007). In the study of Cohen and Bailey (1997), supervision was not being discussed in isolation but rather was used to compare and contrast with leadership theory and leader's supervisory behaviors, moods and expectations. Instead of using supervision, in this study it has been expanded and substituted with leadership roles in order to evaluate how leadership roles can influence project team effectiveness in a research model.

In this study, Project Team Effectiveness is defined as the project manager's perception on team members' performance in task completion, goal achievement, empowerment, information
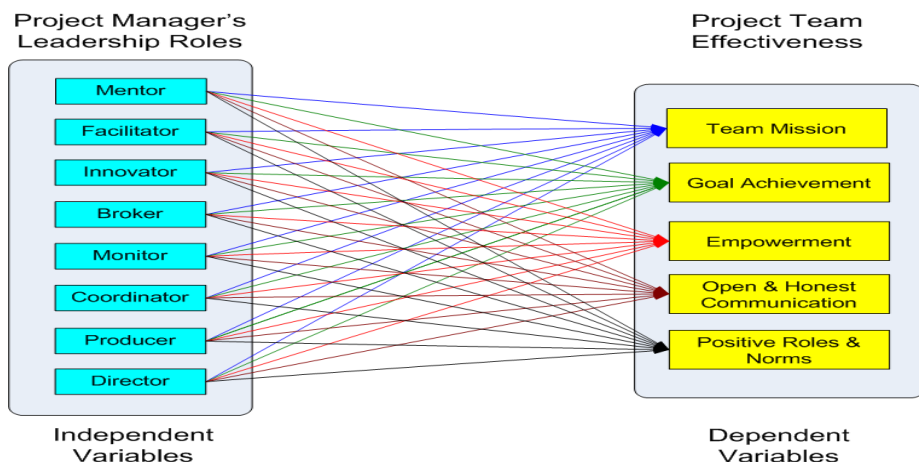
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sharing and team's ability to create and sustain a good working environment *(Hoevemeyer, 1993; Bourgault et al., 2008).* Despite Cohen and Bailey (1997) had described the three dimensions of team effectiveness and their examples of measurement, there is no questionnaire derived from that study to measure those dimensions. According to Hoevemeyer (1993), project team effectiveness can be measured in the following five criteria of effectiveness: (a) team mission, (b) goal achievement, (c) empowerment, (d) open and honest communication, and (e) positive roles and norms. The positive roles refer to team members' project roles and not the project manager's leadership roles. Specific questionnaire tool is developed by Hoevemeyer (1993) to measure the above five criteria of project team effectiveness. These five measurement criteria are also in line with Cohen and Bailey (1997) factors which directly contributing to effectiveness. For example, team mission and goal achievement are corresponding to design factors. Empowerment, open and honest communications are corresponding to group processes, while positive roles and norms are corresponding to group psychosocial traits.

Pinto (2007) characteristics of effective project teams include: (a) a clear sense of mission, (b) a productive interdependency, (c) cohesiveness, (d) trust, (e) enthusiasm and (f) results orientation which are in synchronous with Hoevemeyer (1993) five measurement criteria of project team effectiveness. Pinto's clear sense of mission is similar to Hoevemeyer's team mission. Pinto's results orientation proposed that a project team is committed to achieving the project's goals and this is similar to Hoevemeyer's goal achievement. Pinto's trust is related to Hoevemeyer's empowerment whereby when team members are entrusted by a project manager, they will be empowered to perform their work well. Moreover, trust is also related to Hoevemeyer's open and honest communication in which the existence of the latter will trigger trust among the team members. Lastly, Pinto's three characteristics i.e. a productive interdependency, cohesiveness and enthusiasm are similar to Hoevemeyer's positive roles and norms.

3. RESEARCH MODEL

The following Figure 3 illustrated the research model developed for this study:

Figure- 3. Research Model of this Study

3.1. Constructs' Operational Definitions

Project Team Effectiveness is defined as the project manager's perception on team members' performance in task completion, goal achievement, empowerment, information sharing and team's ability to create and sustain a good working environment (Hoevemeyer, 1993; Bourgault et al., 2008).

Team Mission is defined as a jointly developed and agreed upon statement between project manager and team members on why the team exists, where it is going and why it is going to that direction (Hoevemeyer, 1993).

Goal Achievement is defined as the attainment of team goals which are clear, specific, measurable, realistic and achievable (Hoevemeyer, 1993)

Empowerment is defined as a provision of confidence in team members for being able to think, reason, plan as well as having power and freedom to act accordingly (Hoevemeyer, 1993).

Open and Honest Communication is defined as a communication without being afraid to tell the truth or to be punished (Hoevemeyer, 1993)

Positive Roles and Norms are defined as team members' capabilities to fulfil their responsibilities and rules of behavior (Hoevemeyer, 1993).

Leadership Roles are defined as the collection of eight roles which includes facilitator, mentor, innovator, broker, producer, director, coordinator and monitor that an effective project manager can demonstrate appropriately in a complex and rapidly changing environment (Denison et al., 1995).

Mentor is defined as a leadership role that is caring, empathetic, acknowledges team members' personal needs and helps developing them (Quinn, 1988).

Facilitator is defined as a leadership role that acknowledges team members' personal need, helps developing them, practices participation and team building, focuses on consensus building, manages conflict and encourages participative decision-making (Quinn, 1988).

Innovator is defined as a leadership role that inspires, anticipates customer needs, initiates significant changes, generates new ideas, dares to experiment, resolves problems and adaptable to different situations (Quinn, 1988).

Broker is defined as a leadership role that is similar to Innovator but also includes behaviors that sell ideas, influences decisions at higher levels, acquires needed resources and is also a strong negotiator (Quinn, 1988).

Monitor is defined as a leadership role that clarifies policies, expects accurate work deliverables, controls projects, monitors progress, develops measures and checkpoints in a project team (Quinn, 1988).

Coordinator is defined as a leadership role that is similar to Monitor but also includes bringing order, planning schedules, providing stability, control and continuity to a project team (Quinn, 1988).

Producer is defined as a leadership role that focuses on outside competition, emphasizes on speed, hard work ethics, motivates team members and initiates action in a project team (Quinn, 1988).

Director is defined as a leadership role that is similar to Producer but also includes providing clear direction, clarifying priorities, communicating the vision and plans to team members (Quinn, 1988).

3.2. Hypotheses

H1a: Mentor role is positively influencing Team Mission

H1b: Facilitator role is positively influencing Team Mission

H1c: Innovator role is positively influencing Team Mission

H1d: Broker role is positively influencing Team Mission

H1e: Monitor role is positively influencing Team Mission

H1f: Coordinator role is positively influencing Team Mission

H1g: Producer role is positively influencing Team Mission

H1h: Director role is positively influencing Team Mission

H2a: Mentor role is positively influencing Goal Achievement

H2b: Facilitator role is positively influencing Goal Achievement

H2c: Innovator role is positively influencing Goal Achievement

H2d: Broker role is positively influencing Goal Achievement

H2e: Monitor role is positively influencing Goal Achievement

H2f: Coordinator role is positively influencing Goal Achievement

H2g: Producer role is positively influencing Goal Achievement

H2h: Director role is positively influencing Goal Achievement

H3a: Mentor role is positively influencing Empowerment

H3b: Facilitator role is positively influencing Empowerment

H3c: Innovator role is positively influencing Empowerment

H3d: Broker role is positively influencing Empowerment

H3e: Monitor role is positively influencing Empowerment

H3f: Coordinator role is positively influencing Empowerment

H3g: Producer role is positively influencing Empowerment

H3h: Director role is positively influencing Empowerment

H4a: Mentor role is positively influencing Open and Honest Communication

H4b: Facilitator role is positively influencing Open and Honest Communication

H4c: Innovator role is positively influencing Open and Honest Communication

H4d: Broker role is positively influencing Open and Honest Communication

H4e: Monitor role is positively influencing Open and Honest Communication

H4f: Coordinator role is positively influencing Open and Honest Communication

H4g: Producer role is positively influencing Open and Honest Communication

H4h: Director role is positively influencing Open and Honest Communication

H5a: Mentor role is positively influencing Positive Roles and Norms

H5b: Facilitator role is positively influencing Positive Roles and Norms

H5c: Innovator role is positively influencing Positive Roles and Norms

H5d: Broker role is positively influencing Positive Roles and Norms

H5e: Monitor role is positively influencing Positive Roles and Norms

H5f: Coordinator role is positively influencing Positive Roles and Norms

H5g: Producer role is positively influencing Positive Roles and Norms

H5h: Director role is positively influencing Positive Roles and Norms

4. METHODOLOGY

4.1. Sample and Procedure

Based on the deductive research question of this study, cross sectional quantitative research with online survey method was used. Emails embedded with questionnaire's hyperlink were sent out to all the 420 target respondents (project managers) from Project Management Institute (PMI) Malaysia Chapter. PMI Malaysia Chapter is a premier representative body of project management in Malaysia and it has the national e-mailing list of experienced and certified project managers. PMI is a global not-for-profit association for project management professionals that have presence in many countries including Malaysia. PMI has over 350,000 members worldwide and it was established in 1969 with headquarter outside Philadelphia, USA (Project Management Institute, 2008).

4.2. Constructs' Measurement

The following Table 2 depicts the measurement of all the constructs used in this study:

Table-2. Sources of Constructs

No.	Construct	Item Quantity	Scale	Measuring Instruments
1.	**Leadership Roles:**			
1.1	Mentor	2	7 pt-Likert	Adapted from Denison *et al.* (1995)
1.2	Facilitator	2	7 pt-Likert	Adapted from Denison *et al.* (1995)
1.3	Innovator	2	7 pt-Likert	Adapted from Denison *et al.* (1995)
1.4	Broker	2	7 pt-Likert	Adapted from Denison *et al.* (1995)
1.5	Monitor	2	7 pt-Likert	Adapted from Denison *et al.* (1995)
1.6	Coordinator	2	7 pt-Likert	Adapted from Denison *et al.* (1995)
1.7	Producer	2	7 pt-Likert	Adapted from Denison *et al.* (1995)
1.8	Director	2	7 pt-Likert	Adapted from Denison *et al.* (1995)
2.	**Project Team Effectiveness:**			
2.1	Team Mission	4	7 pt-Likert	Adapted from Hoevemeyer (1993)
2.2	Goal Achievement	4	7 pt-Likert	Adapted from Hoevemeyer (1993)
2.3	Empowerment	4	7 pt-Likert	Adapted from Hoevemeyer (1993)
2.4	Open and Honest Communication	4	7 pt-Likert	Adapted from Hoevemeyer (1993)
2.5	Positive Roles and Norms	4	7 pt-Likert	Adapted from Hoevemeyer (1993)

In order to measure all the eight leadership roles, Likert scales (ranging from 1 to 7) with anchors ranging from "Almost Never" to "Almost Always" were used. The five criteria of project team effectiveness were measured using Likert scales (ranging from 1 to 7) with anchors ranging from "Strongly Disagree" to "Strongly Agree".

Reasons to use responses from project managers instead of project team members are: (a) there is a bias view from team members whereby team members attribute negative project outcome to external factors while attributing success to themselves (Standing *et al.*, 2006), (b)

team members do not have vested interest in team effectiveness compare to project manager whereby project manager normally adopt a more balanced view which attributes success to external factors and only partially to themselves, while also assume significant personal responsibility for project team failure or any negative outcome (Standing *et al.,* 2006), (c) unlike concentrated project manager's community whereby collecting data from previous project team members is challenging as more tedious efforts are required to track them. Moreover, this may not be feasible as they may have been disbanded, not contactable or too busy being involved in other projects (Webber, 2002).

5. RESULTS

5.1. Demographic Findings

Out of the total 420 respondents, only 48% had responded with useable sample of 201. Sample's margin of error at 95% confidence is 6.9% based on the formula $0.98/\sqrt{n}$ whereby "n" is the sample size i.e. 201. Among 201 respondents, 79% (159) of them were male and 81% (162) of them aged between 30 and 49 years. Sixty two percents of the respondents had more than 10 years project management experience and 93% of them hold a Bachelor degree or higher. Sixty one percent of respondents were in firms with more than 500 employees. Ninety six percents of the respondents were project managers, the balance 4% consisted of project sponsor, quality manager, purchasing director and support manager who were involved in project management. In the online survey, respondents were requested to fill up the questionnaire based on a project that they had completed recently, regardless whether the project outcome was positive or negative. More than half of the projects completed were in chemical / petroleum, construction, financial and information communication technology (ICT) industries and cost more than Ringgit Malaysia five million each. Eighty two percents of the projects took less than two years to complete and each project has an average of 10 team members.

5.2. Descriptive Statistics, Reliability and Validity Analysis

Albeit Cronbach's Alpha is widely used as an estimator for reliability tests, it has been criticized for its lower bound value which underestimates the true reliability (Peterson and Kim, 2013). Composite Reliability can be used as an alternative as its composite reliability value is slightly higher than Cronbach's Alpha whereby the difference is relatively inconsequential (Peterson and Kim, 2013). In this study, Composite Reliability for all constructs were above 0.7 which indicated that there was high reliability (see Table 3). Convergent validity was assured in the study because the Average Variance Extracted (AVE) for each construct except empowerment was larger than 0.5.

Table-3. Reliability and Descriptive Statistics

No.	Construct	Composite Reliability	AVE	Mean	Standard Deviation
1	**Leadership Roles**				
1.1	Mentor	0.94	0.89	5.23	0.81

No.	Construct	Composite Reliability	AVE	Mean	Standard Deviation
1.2	Facilitator	0.83	0.72	5.12	0.83
1.3	Innovator	0.87	0.77	4.58	0.79
1.4	Broker	0.78	0.64	4.59	0.94
1.5	Monitor	0.88	0.78	5.17	0.96
1.6	Coordinator	0.89	0.80	5.33	0.90
1.7	Producer	0.93	0.87	5.74	0.89
1.8	Director	0.92	0.85	5.73	0.83
2	**Project Team Effectiveness**				
2.1	Team Mission	0.86	0.61	5.80	0.62
2.2	Goal Achievement	0.76	0.62	5.76	0.58
2.3	Empowerment	0.75	0.50	5.62	0.68
2.4	Open and Honest Communication	0.83	0.71	5.80	0.67
2.5	Positive Roles and Norms	0.84	0.63	5.70	0.64

In Table 4, correlation between pairs of constructs was below 0.9 and the square roots of AVEs (highlighted in bold) were listed in the diagonal line of the table. Correlation between pairs of constructs below 0.9 indicated there was no common method bias (Bagozzi *et al.*, 1991). Common method bias occurs when there is a variance attributable to the measurement method instead of the constructs that the measures try to represent (Podsakoff *et al.*, 2003). Any highly correlated constructs are evidence of common method bias whereby usually results in extremely high correlations i.e. more than 0.9 (Bagozzi *et al.*, 1991). All square roots of AVEs were higher than the correlations between constructs indicated the existence of dicriminant validity.

Table-4. Descriptive Statistics, Correlations and Square Roots of AVEs (Diagonal Line)

Construct	ME	FA	IN	BR	MO	CO	PR	DI	TEM	GOA	EMP	OHC	PRN
Mentor (ME)	**0.94**												
Facilitator (FA)	0.25	**0.85**											
Innovator (IN)	0.32	0.24	**0.88**										
Broker (BR)	0.39	0.19	0.63	**0.80**									
Monitor (MO)	0.15	0.54	0.30	0.23	**0.88**								
Coordinator (CO)	0.37	0.51	0.35	0.35	0.63	**0.89**							
Producer (PR)	0.24	0.22	0.23	0.37	0.45	0.45	**0.93**						
Director (DI)	0.28	0.33	0.26	0.40	0.63	0.61	0.75	**0.92**					
Team Mission (TEM)	0.26	0.09	0.16	0.21	0.20	0.24	0.08	0.16	**0.78**				
Goal Achievement (GOA)	0.37	0.21	0.34	0.20	0.30	0.29	0.18	0.26	0.62	**0.78**			
Empowerment (EMP)	0.07	0.43	0.14	0.13	0.38	0.34	0.11	0.20	0.57	0.48	**0.70**		
Open and Honest Communication (OHC)	0.29	0.49	0.37	0.28	0.29	0.37	0.08	0.19	0.49	0.56	0.53	**0.84**	

Construct	ME	FA	IN	BR	MO	CO	PR	DI	TEM	GOA	EMP	OHC	PRN
Positive Roles and Norms (PRN)	0.07	0.25	0.13	0.05	0.27	0.26	0.08	0.13	0.68	0.48	0.50	0.59	**0.79**

5.3. Hypotheses Testing

SmartPLS v2 based on partial least squares (Hair *et al.*, 2013) was used to perform the path analysis. According to Wu (2006), team size and duration of the team stays together can influence team effectiveness. In order to prevent any possible interference from demographic factors, project team size and project duration were incorporated as control variables. Path analysis was used instead of a series of multiple regression analyses because path analysis is more advantageous when there are two or more dependent variables are used e.g. as in this study. Moreover, path analysis can be simulated for all the paths simultaneously mimic the actual environment in which multiple regression analysis can only be performed for one dependent variable at a time (Hair *et al.*, 2010). The path analysis results in a table-form were shown in Table 5. A particular hypothesis is supported when its p-value is significant at the 0.05 level. Total 7 hypotheses were supported which include: H1a, H2a, H2c, H3b, H4b, H4c and H4f. The rest of the 33 hypotheses were not accepted as their p-values were greater than 0.05.

Table-5. Path Analysis Results in Table Form

Hypothesis	Dependent Variable	Influenced by	Independent Variable	Path Coefficients	Inner Model T-Statistics	P-value
H1a	Team Mission	<---	Mentor	0.11	2.07	< 0.05
H1b	Team Mission	<---	Facilitator	-0.05	1.25	
H1c	Team Mission	<---	Innovator	-0.01	0.29	
H1d	Team Mission	<---	Broker	0.03	0.75	
H1e	Team Mission	<---	Monitor	0.06	1.02	
H1f	Team Mission	<---	Coordinator	0.05	1.14	
H1g	Team Mission	<---	Producer	-0.07	0.96	
H1h	Team Mission	<---	Director	0.02	0.26	
H2a	Goal Achievement	<---	Mentor	0.36	3.99	< 0.001
H2b	Goal Achievement	<---	Facilitator	-0.02	0.21	
H2c	Goal Achievement	<---	Innovator	0.36	3.36	< 0.001
H2d	Goal Achievement	<---	Broker	-0.14	1.80	
H2e	Goal Achievement	<---	Monitor	0.15	1.66	
H2f	Goal Achievement	<---	Coordinator	0.02	0.18	
H2g	Goal Achievement	<---	Producer	-0.08	0.62	
H2h	Goal Achievement	<---	Director	0.13	0.87	
H3a	Empowerment	<---	Mentor	-0.06	0.72	

Hypothesis	Dependent Variable	Influenced by	Independent Variable	Path Coefficients	Inner Model T-Statistics	P-value
H3b	Empowerment	<---	Facilitator	0.24	3.81	< 0.001
H3c	Empowerment	<---	Innovator	−0.09	1.16	
H3d	Empowerment	<---	Broker	0.05	0.68	
H3e	Empowerment	<---	Monitor	0.15	1.72	
H3f	Empowerment	<---	Coordinator	0.07	0.92	
H3g	Empowerment	<---	Producer	−0.05	0.35	
H3h	Empowerment	<---	Director	−0.05	0.37	
H4a	Open & Honest Communication	<---	Mentor	0.08	1.16	
H4b	Open & Honest Communication	<---	Facilitator	0.33	5.38	< 0.001
H4c	Open & Honest Communication	<---	Innovator	0.27	3.38	< 0.001
H4d	Open & Honest Communication	<---	Broker	−0.01	0.15	
H4e	Open & Honest Communication	<---	Monitor	−0.08	1.14	
H4f	Open & Honest Communication	<---	Coordinator	0.14	2.07	< 0.05
H4g	Open & Honest Communication	<---	Producer	−0.19	1.29	
H4h	Open & Honest Communication	<---	Director	0.08	0.59	
H5a	Positive Roles & Norms	<---	Mentor	0.00	0.00	
H5b	Positive Roles & Norms	<---	Facilitator	0.06	1.18	
H5c	Positive Roles & Norms	<---	Innovator	0.04	0.61	
H5d	Positive Roles & Norms	<---	Broker	0.00	0.04	
H5e	Positive Roles & Norms	<---	Monitor	0.13	1.70	
H5f	Positive Roles & Norms	<---	Coordinator	0.10	1.62	
H5g	Positive Roles & Norms	<---	Producer	0.01	0.08	
H5h	Positive Roles & Norms	<---	Director	−0.10	0.98	

The following Figure 4 depicts the path analysis results in a diagrammatic-form. Despite both control variables i.e. project team size and project duration were incorporated in the research model for testing, none of them significantly influencing any component of project team effectiveness. On the other hand, only mentor role is positively influencing team mission of project team effectiveness (b = .11, p < .05). Goal achievement is positively influenced by both mentor role (b = .36, p < .001) and innovator role (b = .36, p < .001). Moreover, facilitator role is

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positively influencing empowerment (b = .24, p < .001). In terms of open and honest communication within team effectiveness, there are three leadership roles which are significantly influencing this dependent variable which include facilitator (b = .33, p < .001), innovator (b = .27, p < .001) and coordinator (b = .14, p < .05). There is no leadership role that is influencing positive roles and norms. Lastly, broker, monitor, producer and director roles are not influencing any component of project team effectiveness at all.

Figure-4. Path Analysis Results in Diagrammatic Form
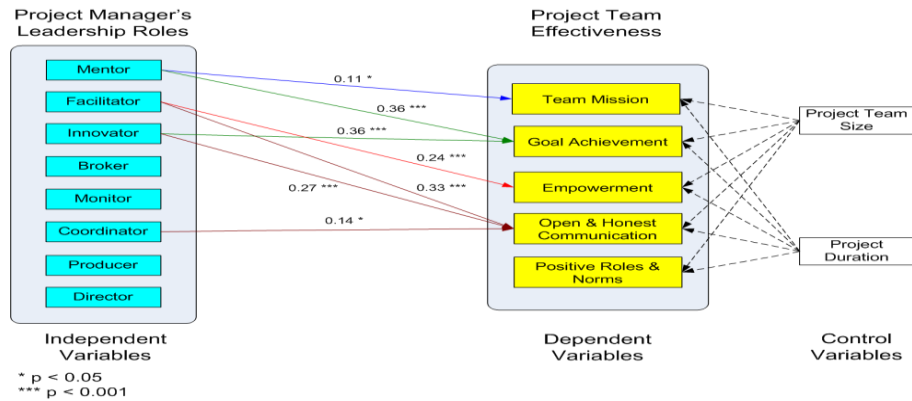
The following Table 6 summarized the hypothesis testing:

Table-6. Summary of Hypothesis Testing

Hypothesis	Supported?
H1a: Mentor role is positively influencing Team Mission	Yes
H1b: Facilitator role is positively influencing Team Mission	No
H1c: Innovator role is positively influencing Team Mission	No
H1d: Broker role is positively influencing Team Mission	No
H1e: Monitor role is positively influencing Team Mission	No
H1f: Coordinator role is positively influencing Team Mission	No
H1g: Producer role is positively influencing Team Mission	No
H1h: Director role is positively influencing Team Mission	No
H2a: Mentor role is positively influencing Goal Achievement	Yes
H2b: Facilitator role is positively influencing Goal Achievement	No
H2c: Innovator role is positively influencing Goal Achievement	Yes
H2d: Broker role is positively influencing Goal Achievement	No
H2e: Monitor role is positively influencing Goal Achievement	No
H2f: Coordinator role is positively influencing Goal Achievement	No
H2g: Producer role is positively influencing Goal Achievement	No
H2h: Director role is positively influencing Goal Achievement	No
H3a: Mentor role is positively influencing Empowerment	No
H3b: Facilitator role is positively influencing Empowerment	Yes
H3c: Innovator role is positively influencing Empowerment	No
H3d: Broker role is positively influencing Empowerment	No
H3e: Monitor role is positively influencing Empowerment	No
H3f: Coordinator role is positively influencing Empowerment	No

Hypothesis	Supported?
H3g: Producer role is positively influencing Empowerment	No
H3h: Director role is positively influencing Empowerment	No
H4a: Mentor role is positively influencing Open and Honest Communication	No
H4b: Facilitator role is positively influencing Open and Honest Communication	Yes
H4c: Innovator role is positively influencing Open and Honest Communication	Yes
H4d: Broker role is positively influencing Open and Honest Communication	No
H4e: Monitor role is positively influencing Open and Honest Communication	No
H4f: Coordinator role is positively influencing Open and Honest Communication	Yes
H4g: Producer role is positively influencing Open and Honest Communication	No
H4h: Director role is positively influencing Open and Honest Communication	No
H5a: Mentor role is positively influencing Positive Roles and Norms	No
H5b: Facilitator role is positively influencing Positive Roles and Norms	No
H5c: Innovator role is positively influencing Positive Roles and Norms	No
H5d: Broker role is positively influencing Positive Roles and Norms	No
H5e: Monitor role is positively influencing Positive Roles and Norms	No
H5f: Coordinator role is positively influencing Positive Roles and Norms	No
H5g: Producer role is positively influencing Positive Roles and Norms	No
H5h: Director role is positively influencing Positive Roles and Norms	No

6. DISCUSSION

There are some lessons learnt from this study. Firstly, team mission is positively influenced by mentor role whereby this role is in the profile related to people and is internal oriented within Quinn's model. Internal orientation depicts a leadership role is focusing on internal dimensions of a project team which includes the team mission of project team effectiveness. Hence, through mentoring role of a project manager, this will help the project team to commit and support the team mission better. This finding is in line with what Dubrin (2007) had suggested that leaders will use their own resources to foster teamwork which include defining the team mission in order for the team to attain it. According to Pinto (2007), when a project manager is leading the team with a clear sense of mission, the team will be more effective and less time is required to resolve problems which might arise due to team members not understanding the team mission. Moreover, mentor role is also flexible oriented indicating it can be applied in less controlled or less stable environment e.g. during initial periods of project implementation or during turbulent time whereby mentoring role needs to be exhibited by the project manager. Facilitator role is not influencing team mission because it goes beyond mentoring whereby the project manger is actually performing team building, managing conflict and encouraging participative decision making. Leadership roles in the profiles like leading change, managing processes and producing results are not influencing team mission because they are external oriented or only plausible during stable environment. For instance, innovator and broker roles are within the "Leading Change" profile which are external oriented i.e. related to dimensions outside the project team like meeting top management expectation or customer satisfaction. Both monitor and coordinator roles are focusing more on managing processes whereby the project manager is trying to put the project under control to achieve stable environment. Producer and director roles are focusing on

producing results and handling external issues like competition between teams rather than within the team e.g. achieving the team mission.

Second lesson learnt is that goal achievement of project team effectiveness is positively influenced by both mentor and innovator roles. These two leadership roles are from two different profiles in Quinn's model i.e. relating to people and leading change. These positive influences are telling us that a project manager needs to mentor and innovate with the team in order to achieve the team goals. Like mentoring the team to commit onto the team mission, the project manager also need to mentor the team to achieve the team goals. Innovation is required when the team is facing challenges in achieving team goals whereby the project manager needs to innovate and explore all the possibilities to lead the team to achieve the goals. This finding supports the goal theory which stated that team members' behavior is governed by values and goals (Dubrin, 2007). The project manager can inspire (which is part of an innovator role) the team to achieve the team goals based on the key values that the project manager is believed in e.g. honesty, personal responsibility, dedication to success and others. It is also evidenced from this study that some leadership roles are not influencing goal achievement within the team. For example, facilitator role which is demonstrated at a lower level i.e. facilitating team building, conflict resolution and participative decision making are beyond the higher level of mentoring. The broker role is not influencing goal achievement as it is influencing decision made outside the team e.g. at external customer level or at higher levels like at top management level. Both monitor and coordinator roles are not influencing goal achievement which is at strategic level because they are more relevant at tactical level for managing processes and suitable for influencing other criteria of project team effectiveness. Likewise, producer and director roles are also focusing more on producing results at a controlled or stable environment which are not influencing the goal achievement.

Thirdly, empowerment of project team effectiveness is only positively influenced by facilitator role. In order to complete the project deliverable committed, project team members need to be entrusted and motivated so that they can deliver what are expected of them. According to Yukl (2010), empowerment in teams is more complex because it allows team members to make important decisions collectively. Hence, through the facilitator role which encourages participative decision-making within the team, a project manager can help empowers the team. This finding is in line with what Yukl (2010) had posited that in order to empower team members, a project manager needs to perform a series of actions which include: (a) delegate authority and responsibility for key activities, (b) take into consideration of individual differences in motivation and skills, (c) express confidence and trust in team members, and (d) provide coaching and advice as and when needed. These actions are resembling to the facilitator role of the project manager. Mentor role is not influencing empowerment because it impacts the higher level components of project team effectiveness like team mission and goal achievement. Both producer and director roles are not influencing empowerment as these roles might perceived by team members as too result oriented and autocratic. These might negate the intention of empowerment i.e. enabling team members feel confident to think, reason, plan and act independently. It is also evidenced from this study that innovator, broker, monitor and

coordinator roles are not influencing empowerment as they are from "Leading Change" and "Managing Processes" profiles that are not aligned with empowerment which deals with team and is more people focus.

Only facilitator, innovator and coordinator roles are positively influencing open and honest communication. When a project manager is serving the facilitator role that acknowledges team members' personal needs and practices participative decision-making, then team members are more open and honest in their communication to form an effective team. Innovator is expected to influence open and honest communication because a project manager needs to be innovative and flexible in articulating his or her ideas, initiatives, changes and inspiration through proper communication so that they are clearly understood by team members. In return, team members are more willing to share their thoughts through open and honest communication to improve the overall team effectiveness. The coordinator role exhibits by a project manager e.g. intervening to drive the entire project on the right track also requires good communication with the team so that team members can understand, communicate and work more effectively. A lesson learnt is that a project manager can only execute these three leadership roles effectively when he or she can communicate clearly with the team. This finding supports the finding of Zimmer and Yasin (1998) which had indicated that two of the characteristics of an effective project manager cum leader are leadership by example and good communicator. This is logical because when a project manager wants to promote open and honest communication in a team, he or she first needs to demonstrate good communication skills for the team to follow. According to Pinto (2007), a project manager needs to lead with good communication skills because one of the reasons that caused a team to fail is poor communication. Good communication skill is important to any project manager whereby Project Management Institute (2008) had listed project communication management as one of the nine project management knowledge areas in its syllabus. There are possible reasons why mentor, broker and monitor are not influencing open and honest communication. Comparing to facilitator which are targeting on lower level components of project team effectiveness like empowerment as well as open and honest communication, mentor role is only influencing higher level components of project team effectiveness which include team mission and goal achievement. The broker role which is related to dimensions outside the project team like meeting top management expectation as well as customer satisfaction clearly indicating that it is focusing on matter beyond open and honest communication within the project team. In comparison to coordinator role which interacts and communicates more with project team, monitor role can be less intensive in terms of communication whereby project manager can monitor the project team's progress using other means e.g. reading reports or conducting observational tours. It is also evidenced from this study that producer and director roles from "Producing Results" profile are not influencing open and honest communication. This may due to the fact that these two roles are more prevalent in controlled or stable environment. For example, when an environment is stable, a project team can still continue to function with minimum communication as team members know what is expected of them. However, in a more dynamic or turbulent environment, a project manager needs to lead with roles that emphasize on

communication like facilitator, innovator and coordinator in order to ensure the team is entrusted with open and honest communication.

Lastly, none of the project manager's leadership role is influencing team members' positive roles and norms which form part of the attributes of an effective team. According to Hoevemeyer (1993), team members' positive roles and norms include their skills, capabilities, responsibilities as well as unwritten rules on how they should behave as a team. This finding suggests that there might be other factors e.g. team trust, team satisfaction and others which is beyond the scope of leadership roles are influencing team members' positive roles and norms. On the other hand, this study also indicated that broker, monitor, producer and director are not influencing any attribute of project team effectiveness. This is possible because these four leadership roles might be related to team performance or project performance instead of team effectiveness. As postulated by Andrews (2012), there is a difference between team effectiveness and team performance whereby the latter is more result oriented. For example, broker involves the role to sell ideas, influence decisions at higher levels as well as acquire resources which is related to performance or results. Monitor, producer and director roles are also more related to performance or results whereby the project manager needs to direct the team, monitor the project progress and produce project results as required by stakeholders. Since team effectiveness criteria from Hoevemeyer (1993) and Bourgault *et al.* (2008) are excluding team performance or result, it is understandable that broker, monitor, producer and director roles are not influencing team effectiveness in this study.

In order to answer the research question on what are the leadership roles that are significantly influencing each criteria of project team effectiveness, it is evidenced from this study that only project manager's mentor, facilitator, innovator and coordinator roles are significant and important. The rest of the leadership roles like broker, monitor, producer and director are not influencing the project team effectiveness. As for which is the most common leadership role that Malaysian project managers are adopting, this study indicates that all three mentors, facilitator and innovator roles are the answer (see Table 7).

Table-7. Leadership Roles and Frequency

Project Manger's Leadership Roles	Frequency of Significance across 5 criteria of Project Team Effectiveness
Mentor	*2*
Facilitator	*2*
Innovator	*2*
Broker	0
Monitor	0
Coordinator	1
Producer	0
Director	0

In order to answer the third research question i.e. which is the least practised leadership role, it is clear from Table 7 above that broker, monitor, producer and director roles are the answer as they are insignificant in all their relationships with the five criteria of project team effectiveness.

7. CONCLUSION

Today, more and more project teams are formed to achieve organizational objectives as organizations generally recognized the importance and benefits of project teams. However, in order to ensure project teams perform effectively, project managers need to learn and exhibit some of the leadership roles proposed by Quinn (1988) as they can impact the project team effectiveness. Based on a sample of 201 project managers, this empirical study had confirmed that a project manager's leadership roles like mentor, facilitator, innovator and coordinator are important in influencing four out of five criteria of project team effectiveness which include team mission, goal achievement, empowerment, open and honest communication. The outcome of this study also shed some lights that the eight leadership roles are not only influencing team effectiveness but also potentially influencing team performance that need further study to validate.

There are some limitations in this study. Firstly, this study did not conclude what are the factors (especially those beyond leadership roles) that can influence team members' positive roles and norms. Perhaps future study should explore other predictors like team trust, team satisfaction and others. Secondly, it is unsure whether insignificant leadership roles like broker, monitor, producer and director can positively influence team performance or project performance. Hence, future research should include such study. Thirdly, future study can include project team members as part of the respondents to evaluate their views as well. Moreover, internal leadership roles i.e. those related to people and process management (Denison *et al.*, 1995) can be extracted and used in future study whereas external leadership roles like those related to "Leading Change" and "Producing Results" can be excluded. The objective is to evaluate whether internal leadership roles can influence project team effectiveness more significantly instead of combining both internal and external leadership roles as adopted in this study. Last but not least, this study was conducted in Malaysia which is in the context of a developing country. It is not sure whether the result can generalize to developed countries. Cross country studies can be conducted to compare the strength of each leadership roles in influencing the five areas of project team effectiveness. In conclusion, this study had contributed a small step into deeper understanding on how leadership roles of a project manager are influencing project team effectiveness in Malaysia. It is also interesting to know through future study how this research model and its findings can generalize to or differentiate from other project teams in different countries.

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