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## **CHPT Construct: Essential Skills for Construction Project Managers**

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**Abstract:** Construction project managers have important roles and responsibility. This research examines 16 previous studies on project manager skills to propose a set of skills that is applicable in the construction industry. It is argued that four skills, namely conceptual, human, political, and technical skill (CHPT construct) are essential for construction project managers to perform their job. This research discusses components that form each skill construct and why they are essential for construction project managers. The key contribution of this research is the inclusion of political skill as one of essential skills for construction project managers. Furthermore, this research should help construction project managers to be aware of essential skills that they need to possess to improve their performance. Finally, a theoretical framework is developed to demonstrate the complexity of project manager's tasks and the CHPT construct. The framework provides a sound foundation for future studies that focus on project manager skills.

**Keywords:** project manager skills; political skill, human resource management; construction project management.

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# 1 Introduction

Construction projects have become more and more complex. New challenges and new regulations, such as environmental, health, and safety, have to be considered in achieving project objectives. It is the responsibility of the project manager to ensure that these objectives are met because he or she is the key person responsible for the success or failure of the project (Lewis, 1998).

Construction projects are unique, which is the key characteristic of project deliverables. For example, there are many residential buildings that have been constructed, but each has different client, different construction project team members, different layout, different location, different contractors, different time frame, different weather conditions, and so on (PMI, 2008). This uniqueness makes it hard for project managers to use their past experience for future projects.

The multidisciplinary characteristic of project team does not help the situation either. The project manager has to lead, manage, and coordinate these people, who have different backgrounds and agendas (Lewis, 1998). In addition, many stakeholders, such as the client, consultants, contractors, top management, government, and community, are involved in a construction project. Although the project manager does not have authority over many of them, he or she has to manage the expectations of these stakeholders to meet project objectives (Rosenau, Jr. and Githens, 2005).

Due to the complexity and importance of project manager's responsibility, studies have been conducted to investigate essential project manager skills for achieving project success. However, many of those studies only explored the essential skills at the conceptual level and did not explain the components to reflect those skills into practice. Furthermore, this research argues that political skill should also be integrated as one of essential skills for project managers. Although its importance tends to be overlooked, political skill is crucial because political processes dominate the field of project management. Many successful project managers have understood the importance of maintaining strong political ties as one method to achieve project success. They are aware that politics can have a significant positive impact on their projects (Pinto, 2000).

This research aims to integrate various literatures on project manager skills to create a framework that is applicable in the construction industry. Sixteen previous studies on essential managerial skills drawn from general management, project management, and construction project management literatures are examined. Based on this, a new set of essential skills is proposed for construction project managers to achieve project success. Lastly the research also suggests a direction for future studies.

## 2 Essential skills for construction project managers revisited

This research examines the previous studies based on the interrelation of knowledge areas as shown in Figure 1. Accordingly, this section is separated into three parts, namely general management, project management, and construction project management. Understanding the relationships between these three knowledge areas is the foundation for developing a new set of essential skills for construction project managers.

‘put figure 1 here’

### 2.1 *General management*

Katz (1974) is one of the pioneers who investigated effective managerial skills. He examined the skills which executives exhibit to carry out their jobs effectively. He suggested three basic developable skills called (1) technical, (2) human, and (3) conceptual. He defines technical skill as the “specialised knowledge, analytical ability within that specialty, and facility in the use of the tools and techniques of the specific discipline”, human skill as “the ability to work effectively as a group member and to build cooperative effort within the team”, and conceptual skill as the “ability to see the enterprise as a whole including recognising how the various functions depend on one another and how changes in one part can affect all the others” (Katz, 1974: pp. 91, 93). Katz also explained that conceptual skill extends to visualising the relationship of the business to the industry, the community, and the political, social, and economic condition as a whole.

Katz’s three-skill approach is so prominent that it has been discussed in various literatures even today. A study by Peterson and Fleet (2004) demonstrated the profound impact of Katz’s work on the management field. They examined 15 management principles books published in the mid-1980s and 15 management textbooks published in early 2000. The result indicated that “Katz’s work was specifically referenced by almost all of the early works and by most of the more recent books” (p. 1301).

Furthermore, Peterson and Fleet (2004) also explored 23 textbooks and identified ten core managerial skills: (1) technical (ability to use methods, procedures, processes, tools, techniques, and specialised knowledge to perform specific tasks), (2) analytic (ability to identify key variables, see how they are interrelated, and decide which ones should receive the most attention), (3) decision making (ability to choose effective solutions from among alternatives), (4) human (ability to work cooperatively with others, to communicate effectively, to motivate and train others, to resolve conflicts, and to be a team player), (5) communication (ability to send and receive information, thoughts, and feelings, which creates common understanding and meaning), (6) interpersonal (ability to develop and maintain a trusting and open relationship with superiors, subordinates and peers to facilitate the free exchange of information and provide a productive work setting), (7) conceptual (ability to see the organisation as a whole and to solve problems from a systemic point of view), (8) diagnostic (ability to determine the probable cause of a problem from examining the symptoms which are observed by the manager), (9) flexible (ability to deal with ambiguous and complex situations and rapidly changing demands), and (10) administrative (ability to follow policies and procedures, process paper work in an orderly manner, and manage expenditures within the limits set by budgets).

## 2.2 *Project management*

Gushgari et al. (1997) conducted a literature review study and they identified 20 skills critical to long-term profitability of engineering firms. Data were collected from 43 firms in the United States to identify the most critical project manager skills for long-term profitability. The results indicated that (1) communication is the most critical skill followed by (2) listening, (3) project management, (4) decision making, (5) leadership and motivation, and (6) problem solving.

Another study was conducted by El-Sabaa (2001) who explored the skills and career path of the ideal project manager in Egypt. El-Sabaa utilised Katz’s (1974) three-skill approach and developed a list of 18 characteristics, traits, and skills of effective project managers, which he clustered into three-skill categories, namely (1) human skill (mobilising, communication, coping with situations, delegating authority, political sensitivity, high self-esteem, and enthusiasm), (2) conceptual and organisational skill (planning, organising, strong goal orientation, ability to see the project as a whole, ability to visualise the relationship of

the project to the industry and the community, and strong problem orientation), and (3) technical skill (special knowledge in use of tools and techniques; project knowledge; understanding methods, processes, and procedures; technology required; and skills in use of computer).

Lientz and Rea (2002) explained the attributes of a good project manager, which include both personal traits and skills. The personal trait attributes are not listed here because they are not relevant to this research that focuses on skills. The remaining skill attributes are (1) communication, (2) generalist (the ability to see in a big picture perspective and relate it to the current project situation), (3) problem and conflict solver, (4) people management, (5) knowledge, (6) perspective (stepping back and taking an overall view of the project), (7) organising, (8) able to take directions and suggestions (listening), (9) familiarity with the organisation (how the organisation functions), (10) knowledge of technology, and (11) managing setup of electronic communication.

Lei and Skitmore (2004) conducted a survey in South East Queensland, Australia, and identified important skills that project managers should be aware of and possess for the future. The important skills are (1) technical skill, (2) people skills, (3) legal understanding, (4) client related skill, (5) stakeholders management skill, (6) cost management skill, (7) computing skill, (8) risk management skill, (9) time management skill, (10) coaching skill, (11) networking skill, and (12) business knowledge.

Gillard and Price (2005) suggested that effective project managers should possess ten competencies that can be grouped into five clusters. The first cluster is goal and action management, which consists of three competencies: (1) diagnostic use of concepts (using a concept to analyse situations, distinguishing between relevant and irrelevant information, and uncovering deviations from plans), (2) efficiency orientation (setting high work standards, self-motivated, establishing challenging but realistic goals, organising works efficiently, overcoming obstacles, and emphasising on performance when talking to others), and (3) proactive (initiating action, rather than waiting for events to unfold). The second cluster is leadership, which consists of two competencies: (4) self-confidence (confidence with own capabilities, belief in the mission, able to effectively relay the mission to subordinates, and taking decisive actions as well as making recommendations unhesitatingly) and (5) use of oral presentations (communicating effectively using different mediums). Human resource management is the third cluster and it consists of two competencies: (6) managing group process (overseeing group processes through consensus building and coordination, building cohesion, facilitating group discussions, and emphasising on common interests) and (7) use of socialised power (developing networks, alliances, and teams, gaining cooperation from others, resolving conflicts, and influencing others). The fourth cluster is directing subordinates and it has two competencies: (8) developing others (coaching, providing feedback, and addressing performance issues) and (9) use of unilateral power (using different authorities and power to obtain compliance and influence others). The fifth and last cluster is focus on others, which consists of only one competency, that is (10) stamina and adaptability (enduring long working hours while sustaining high performance levels and be proactive change agents).

Brill et al. (2006) explored the competencies required for a project manager to be effective in the workplace. They found 117 essential competencies, which can be classified into nine categories: (1) problem-solving expertise, (2) leadership expertise, (3) context knowledge, (4) analytical expertise, (5) people expertise, (6) communication expertise, (7) project administration expertise, (8) tools expertise, and (9) personal characteristics. The personal characteristics category is excluded because it is more related with personal traits rather than skills.

Kerzner (2009) listed ten required skills for project managers: (1) team building, (2) leadership, (3) conflict resolution, (4) technical expertise, (5) planning, (6) organisation (defining the reporting relationships, responsibilities, lines of control, and information needs), (7) entrepreneurship (understanding of general management such as economic considerations, customer satisfaction, and future growth), (8) administration, (9) management support (stakeholder management), and (10) resource allocation.

In the PMBOK guide, Project Management Institute (PMI, 2008) acknowledges the importance of technical, interpersonal, and conceptual skills for effective project managers. PMI (2008) explained further on the interpersonal skills and described eight important interpersonal skills: (1) leadership (focusing the efforts of a group of people to achieve a common goal and team facilitation), (2) team building (helping a group of individuals to work interdependently with each other), (3) motivation (providing what people value the most to create an environment to achieve project objectives), (4) communication (be aware of communication styles of others, managing various communication channels, and listening), (5) influencing (using power and strategies to get others to cooperate towards common goals), (6) decision making (considering various factors in making decisions), (7) political and cultural awareness (recognising project politics, using power appropriately to manage the project, and managing cultural diversity to create an environment of trust), and (8) negotiation (discussing with other parties to compromise or reach an agreement).

### *2.3 Construction project management*

Goodwin (1993) applied Katz's (1974) three-skill approach and examined the skills of the project manager in the context of the project management process with a particular focus in construction projects. Goodwin identified two project manager's roles: project integration and leading project team. In order to perform these roles, project managers need to possess four skills: (1) conceptual skill, (2) human skill, (3) negotiating skills, and (4) technical skill. He further explained that conceptual skill is crucial to project success because it helps the project manager to conceptualise all elements in the project and determine how those elements interact with each other. Project managers need to exercise their human skill to build cooperative efforts within the project team and other project stakeholders. Furthermore, there are many unforeseen situations that can potentially arise after the project plan has been formulated. Hence the project manager must use a suitable negotiating style that will maximise the benefits of the agreement towards the project. Lastly, technical problems are common in construction projects and they need to be resolved quickly to avoid from impacting the project objectives adversely. Although technical experts are normally included in the project team, the project manager should also has a clear conception of the interaction between the technical elements and other elements to ensure that the whole project is integrated properly (Goodwin, 1993).

Odusami (2002) investigated the most important skill of an effective project manager in the construction industry as perceived by professionals in clients' organisations, consultancy firms, and contracting firms. He collected data based on 13 skills developed from previous literatures: communication, decision making, delegation, financial management, leadership and motivation, listening, negotiation, organising, planning and goal setting, problem solving, quality management, technical knowledge, and time management. The results indicated that (1) decision making, (2) communication, (3) leadership and motivation, and (4) problem solving were the four most important skills, while negotiation skill was ranked the least important.

Dainty et al. (2003) conducted a series of focus groups to investigate criteria for measuring construction project managers' performance and encouraging their professional development.

They identified 43 criteria that can be summarised into nine factors: (1) team building (forming and gelling the team to ensure a stable project environment), (2) leadership (allocating tasks and providing direction), (3) decision making (taking the lead on key management decisions needing to be made during the project's development), (4) mutuality and approachability (ensuring good internal trust relations within the team), (5) honesty and integrity (indicating self-portrayal of the project manager to other project team members), (6) communication (effective communication both internally and externally to other project stakeholders), (7) learning, understanding and application (assimilating information and using it to formulate appropriate actions), (8) self-efficacy (managing self to maintain desirable work performance), and (9) external relations (dealing with external relations with those outside of the project team).

Cheng et al. (2005) suggested that there are 12 competencies underpin effective project management performance in the construction industry. Half of those competencies are related to personal traits, thus they are excluded from this research. The competencies related to project manager skills are (1) impact and influence (proficiency in coordinating, inspiring and directing the team), (2) directiveness (effort to ensure that individual subordinates comply with his/her wishes in the way that was intended), (3) teamwork and cooperation (influencing the team to perform in a desirable manner), (4) team leadership (recognising when and when not to act authoritatively if they are to get the best out of their colleagues), (5) analytical thinking (conception, analysis and reasoning in order to make appropriate management decisions), and (6) conceptual thinking (being able to see the bigger picture).

Chen et al. (2008) conducted a study on construction project management competence from a Chinese perspective. They proposed that construction project managers need to have (1) an ability to plan, (2) knowledge of construction work, (3) knowledge of commercial management, (4) ability to communicate, (5) ability to manage team, (6) ability to coordinate, and (7) ability to build relationships.

Lastly, Farooqui et al. (2008) assessed the critical skills for project managers in Pakistani construction industry. They identified 20 skills for construction project managers based on previous studies: (1) administration, (2) communication, (3) creativity, (4) decision making, (5) delegating, (6) financial management, (7) leadership and motivation, (8) listening, (9) negotiation, (10) organising, (11) personal adaptability, (12) planning and goal setting, (13) problem solving, (14) ability to follow up, (15) critical path thinking, (16) quality management, (17) result orientation, (18) risk taking, (19) technical knowledge, and (20) time management.

## 2.4 *Political issues*

In today's workplace, it is essential to know what to do and how to do it in genuine, sincere, and convincing ways. It is important to know when and how to put oneself in the proper place on certain issues to take advantage of and create opportunities (Ferris et al., 2005). Some people consider that politics is distasteful and organisationally damaging. However, several studies have indicated that the effective use of political skill is important to a manager's career. This is because organisations are political arenas where competing interests, limited resources, coalition building, and the exercise of power and influence happen all the time to get things done. The exercise of politics is often one of the prime driving forces in the organisation, for better or worse (Ferris et al., 2000; Pinto, 2000).

Pinto (2000) explained that political processes dominate the field of project management. Project managers often do not have a stable base of power, thus they have to influence others to secure resources from other departments to achieve project success. Many successful project managers have understood the importance of maintaining strong political ties in their

organisations as a method to attain project success. They are aware that politics, used wisely, can have a significant positive impact on the implementation of their projects (Pinto, 2000).

The conduct of politics is also essential in construction project management. In a construction project, there are many stakeholders involved ranging from government departments/agencies to clients and designers as well as contractors, suppliers, and community. Each stakeholder has different expectations and the project manager has to manage these expectations by exercising their political skill to make sure that every stakeholder is satisfied, get jobs done, and achieve project objectives (Kerzner, 2009; Rosenau, Jr. and Githens, 2005). Peled (2000) stated that political skill is the secret weapon for project managers to complete their projects successfully. Politically savvy project managers manage their projects upwards and outwards and tailor their visions to the day-to-day reality of their organisations. On the contrary, project managers who are lack in political skill fail because they tend to manage their project downwards and inwards and build generic solutions to fit any organisation. Another study showed that political risks in international projects, such as government-sourced risks, society-imposed risks, and interstate risks, are major threats to achieve project success, thus political skill is critical to manage these political risks (Khattab et al., 2007).

In summary, politics is a normal occurrence in every organisation. Politics is also inevitable in construction projects, thus political skill is essential for project managers to achieve project success. However, despite its importance, political skill tends to be overlooked. Therefore, this research argues that political skill should also be integrated as one of essential skills for project managers.

### **3 The inception of CHPT construct**

Based on the 16 studies discussed in the previous section, this research proposes four sets of essential skills for construction project managers, called CHPT construct, in which C stands for conceptual skill, H for human skill, P for political skill, and T for technical skill. Katz's (1974) work serves as the foundation in the development of the CHPT construct because it is clear that his three-skill approach has been universally accepted, thus it is important to maintain a common ground for future studies in this area. We, however, propose political skill as an additional skill essential for construction project managers because political issues have become an integral part in construction project management.

Table 1 summarises the essential skills discussed in previous studies and how those skills can be incorporated into the four-skill approach of CHPT construct. Since conceptual, human, and technical skill have been widely discussed, this research focuses on elucidating how previous studies can be linked to political skill.

‘put Table 1 here’

First, El-Sabaa (2001) only identified three-skill categories namely human, conceptual and organisational, and technical. However, by examining El-Sabaa's work further, one of components under the human skill category is political sensitivity, which can be linked to political skill proposed in this research. Second, Lei and Skitmore (2004) identified networking skill as one of important skills for project managers. This particular skill is closely related with one of political skill dimensions, networking ability, which is the ability to develop and use diverse networks of people to achieve project or organisation's objectives (Ferris et al., 2005).

Third, political skill is related with self-confidence, managing group process, use of socialised power, and use of unilateral power suggested by Gillard and Price (2005). Ferris et



al. (2000) stated that people with high political skill display self-confidence at the proper level, which is seen as a positive attribute by others. Concerning managing group process, Ahearn et al. (2004) have conducted a study which showed that political skill causes teams to perform more effectively. Use of socialised power is about developing networks and alliances, which is related with networking ability of political skill (Ferris et al., 2005). Lastly, political skill makes people highly adaptable, thus they are able to select methods of influence and self-presentation that are most appropriate in certain situations (Ferris et al., 2007). This is closely related with the use of unilateral power or using different types of power to influence others as proposed by Gillard and Price (2005).

Fourth, PMI (2008) suggested influencing and political and cultural awareness as important skills for project managers. These two skills are clearly related with political skill as discussed above. Fifth, mutuality and approachability, honesty and integrity, and external relations proposed by Dainty et al. (2003) can also be linked to political skill. People with high political skill know what to do in different social situations at work and how to do it in a sincere manner, thus they give a sense of approachability and appear to have good characters. Furthermore, Block (1983) explains that project managers need to interact with people outside the team that have impact on the success of the project, which is what Dainty et al. (2003) meant by external relations.

Sixth, impact and influence, directiveness, and teamwork and cooperation proposed by Cheng et al. (2005) are all concerning influencing others to perform in a desirable manner, which is the function of political skill. Seventh, Chen et al. (2008) suggested ability to build relationships as an importance competence in construction project management. This skill is clearly in line with social astuteness of political skill where people high in political skill are considered ingenious and clever when dealing with others (Ferris et al., 2005). Eight and lastly, political skill makes people highly adaptable because of their social astuteness (Ferris et al., 2007), which is related with personal adaptability skill identified by Farooqui et al. (2008).

## **4 The development of CHPT construct**

This section explores CHPT construct in detail including the components that form each skill construct. Many previous studies did not elaborate the components that are needed to manifest their essential skills in practice. This research aims to argue in this context and explain briefly how each component can be implemented in the construction industry.

### **4.1 CHPT: Conceptual skill construct**

Conceptual skill is “the ability of a project manager to envision the project as a whole”. The skill recognises that various functions in the project depend on one another where changes in one part could affect other parts (El-Sabaa, 2001, p.2). Conceptual skill is essential to deal with abstract situations, to view the project in a big picture perspective, to understand the relationship between different departments, and to imagine how the project fits into its broader environment (Robbins et al., 2009). Conceptual skill of people who make decision and those who put it into action is crucial for the success of the project. For instance, when a major change in certain project aspect is made, the project manager needs to consider its impacts on progress, control, budget, schedule, and the stakeholders involved (Katz, 1974).

Goodwin (1993) added that a high level of conceptual skill is essential for project managers because of the diversity of the project system and to make sure that all components in the project function together as an integrated whole. He elaborated further that the lack of project manager’s conceptual skill has caused problems that has led to a complete failure of

the project. Based on its definition and functions, this research argues that there are three components that form the conceptual skill construct namely visioning, scoping, and integration. These three components are especially vital for planning, organising, contractual and legal understanding, problem solving, and decision making in the project.

### *Visioning*

Visioning is the skill to view the project as a whole and visualise the relationship of the project to the organisation, the industry, the community, and other external environments (El-Sabaa, 2001). This component is also crucial for project managers to have a clear orientation towards results and progress. Through visioning, project managers will have a clear conception of what needs to be achieved in every stage of the project. It allows project managers to change the plan accordingly as new insights and knowledge are obtained (Sundström and Zika-Viktorsson, 2009).

### *Scoping*

Scoping is the skill to determine and control what needs to be and not to be included in the project. The scoping skill of the project manager is critical to ensure that all the work required for the project and only the work required has been counted in to complete the project successfully (PMI, 2008). The skill is also important to prepare a contractual agreement in which the scope of the project must be clearly determined to avoid any future disputes and litigation that will adversely impact various parties involved in the agreement.

### *Integration*

This is an essential skill for project managers to ensure that all project aspects are properly identified, defined, combined, unified, and coordinated. Integrating all project tasks, sequencing and timing of activities, and necessary resources to perform and complete the project during the planning stage is an example of integration skill in practice. In the design stage, the project manager needs to integrate all design aspects, such as structure, architecture, mechanical, electrical, and interior, and make sure that each aspect works as specified. During the construction stage, integration is used to make choices where to concentrate resources and effort, managing various project issues, and making trade-offs among competing objectives and alternatives (Goodwin, 1993; PMI, 2008).

## *4.2 CHPT: Human skill construct*

Human skill is the ability to work with and through other people (Goodwin, 1993; Katz, 1974, Robbins et al., 2009). In a construction project, there are many stakeholders involved who have an interest in the project or the outcome of the project. Each stakeholder has different expectations and the project manager needs to exercise his or her human skill to manage stakeholders' expectations (Rosenau, Jr. and Githens, 2005). Furthermore, in each stage of construction project life cycle, it is people who perform the works, thus, again, understanding of human skill to manage these people is vital (Cowie, 2003). The effectiveness of the project manager much depends on his or her ability to build cooperative efforts within the project team and other project stakeholders (Rosenau, Jr. and Githens, 2005). This research identifies three vital components of human skill construct namely emotional intelligence, interpersonal skill, and leadership. Project managers need emotional intelligence to be self-aware, to manage their feelings and emotions, and to understand

feelings and emotions of others. Through this understanding of self and others, project managers can exercise their interpersonal skill to build relationships with others. Finally, after building relationships with others, project managers can apply their leadership skill and lead people to achieve goals.

### *Emotional intelligence*

Emotional intelligence is “the capacity for recognising our own feelings and those of others, for motivating ourselves, and for managing emotions well in ourselves and in our relationships” (Goleman, 1998: p.375). Goleman (2001) explained that there are four dimensions of emotional intelligence: self-awareness, self-management, social-awareness, and relationship management. Self-awareness means to know oneself feeling at the moment and use it in decision making. A person high in self-awareness is aware of his or her strengths and weaknesses, opening to feedback, and willing to learn from past experiences. Self-management is an ability to regulate distressing affects, such as anxiety and anger, and to restrain emotional impulsivity, thus a person will be able to hold in mind the positive feelings that will come when he or she achieves goals and inhibits the negative feelings. A person high in self-management is often able to boost motivation. With social-awareness, a person can recognise other people’s feelings. A person with this ability can read nonverbal cues for emotional currents from others. This is critical for job performance when the focus is on interactions with people. Further, relationship management is an ability to attune oneself to or influence the emotions of others.

Carmeli (2003) argued that emotionally intelligent senior managers do better on the job than their counterparts. Sunindijo et al. (2007) indicated that emotional intelligence generates delegating, open communication, and proactive behaviour on construction project managers and engineers, which can bring positive outcomes to the project that they manage.

### *Interpersonal skill*

Interpersonal skill is the ease and comfort of communications between project managers and their staff, colleagues, superiors, clients, and other stakeholders (Peled, 2000). Strohmeier (1992) has identified four common interpersonal problems in the project environment that have to be managed by project managers. The first problem is a difficulty to motivate project stakeholders. Normally project managers have lack of formal authority and influence, which can cause difficulties to motivate others to achieve project objectives. The second problem is conflicts, which are actually normal occurrences in every organisation. However, project managers need to manage different stakeholders’ expectations, thus the intensity of conflicts is much higher in the project environment. Ineffective communication is the third interpersonal problem. Due to the involvement of many stakeholders, communication problems are frequent in a project. Typical problems are insufficient flow of information within project teams and stakeholders, misunderstanding, excessive amounts of information, the unavailability of necessary information, and late arrival of information. The fourth and last problem is lack of teamwork and cooperation. Many stakeholders in a project are suffered from egotism, which frustrates cooperation and communication. Within a project team, frequently there is lack of willingness to cooperate or even an inability to cooperate. Each individual develops personal career goals and has competitive thinking. Envy and jealousy of colleagues’ success is also a common thing.

Project managers need to understand and implement the concept of motivation, conflict management, effective communication, and team building to solve these interpersonal problems. First, project managers must have an understanding of human behaviour is to

motivate people. Many motivational theories have been developed for this purpose. In a project environment, Kerzner (2009) suggested that in order to motivate others, project managers should let people know why they involve in the project, place people in positions for which they are trained, let people understand how their efforts impact the project as a whole, adopt a positive attitude, do not make promises that cannot be kept, give challenging but attainable assignments, clearly define performance expectations, and give honest appraisals. Second, project managers have to apply different conflict resolution styles to manage conflicts. Rahim (1992) and Bushyacharu (1996) proposed five styles to manage conflicts, namely avoidance, dominating, accommodating, compromising, and collaborative. Project managers should use the most appropriate style to manage conflicts effectively, thus the achievement of project objectives is not hindered.

Third, project managers should also be good communicators to deal with communication problems. Brill et al. (2006) suggested that in order to communicate effectively, project managers have to listen effectively, have strong verbal, graphical, and written communication skills, deliver good and bad news effectively, have strong presentation skills, be able to liaise among stakeholders, and have strong networking skills. Fourth, project managers should develop teamwork and cooperation by implying a genuine intention to work cooperatively with others and provide effective team leadership by using different approaches to get the best out of the team (Cheng et al., 2005). Team building is an ongoing process, thus project managers should continually monitor team functioning and performance to see corrective actions that may be needed to prevent or solve teamwork and cooperation problems (Kerzner, 2009).

### *Leadership*

Drucker (1996: p.xi) offered a straightforward definition of leadership by stating that “the only definition of a leader is someone who has followers”. Leadership can also be considered as the process of influencing a group of people to achieve common goals, thus leaders are people who make things happen (Robbins et al., 2009). In a construction project, the project manager is the project leader. Leadership is vital for project managers to bring project team members together and influence them to do what must be done to achieve project objectives (Lewis, 2003).

Many leadership studies have been done over the years and many leadership theories have been proposed. Research indicated that transformational leadership is an effective leadership style because it produces levels of employees’ effort and performance that go beyond what would occur with the common transactional approach, which is based on the assumption that employees are motivated through a system of reward and punishment (Robbins et al., 2009). A study has found that project managers who exercise transformational leadership enjoy project success. It concluded that a project manager must become a strong transformational role model and use a relationship-oriented approach towards the project team to achieve project success (Prabhakar, 2005)

Bass (1990) proposed four characteristics of transformational leaders as follow:

- Charisma: provide vision and sense of mission, instil pride, gain respect and trust.
- Inspiration: communicate high expectations, use symbols to focus efforts, express important purposes in simple ways.
- Intellectual stimulation: promote intelligence, rationality, and careful problem solving.
- Individualised consideration: give personal attention, treats each employee individually, coach, and advise.

### 4.3 CHPT: Political skill construct

Ahearn et al. (2004: p.311) proposed that political skill is “the ability to effectively understand others at work, and to use such knowledge to influence others to act in ways that enhance one’s personal and/or organisational objectives”. Many people do not understand the important difference between political and human skill. Human skill can be described as the ease and comfort of communications between project managers and other stakeholders. However, some project managers are loved and admired by many, but their projects end in failure. In this situation, political skill is the key. It refers to the ability to manipulate interpersonal relationships with others to ensure the ultimate success of the project (Peled, 2000). Ferris et al. (2000) explained that the main difference between political and human skill is that political skill is specific to interaction aimed to achieve success in organisations. None of previous forms of human skill was developed explicitly to address interpersonal interactions in organisational settings. Furthermore, human skill generally refers to competencies in communication and the ability to interact with others. Political skill, on the other hand, goes beyond mere ease and facility of interaction. It focuses on managing interactions with others in influential ways that lead to individual and organisational goal accomplishment (Ferris et al., 2005).

Some people consider politics as distasteful and organisationally damaging. However, several studies indicated that the effective use of political skill is important to a manager’s career. This is because organisations are naturally political arenas where competing interests, limited resources, coalition building, and the exercise of power and influence happen all the time to get things done. Furthermore, despite personal disdain of many people for exercising politics, this process is often one of the main driving forces in the project and organisation, for better or worse (Ferris et al., 2000; Pinto, 2000).

Several studies have shown the importance of political skill in organisations. Mainiero (1994) found that political skill is an important factor that contributes to career advancement of women, while Perrewé and Nelson (2004) also argued that political skill is essential for successful female managers. Spencer and Spencer (1993) suggested that well-developed political skill is an important contributor that distinguishes superior performers. Ahearn et al. (2004) suggested that leader’s political skill causes teams to perform more effectively.

Pinto (2000) stated that political processes dominate the field of project management because of its nature. Project managers have to influence others to secure necessary resources to achieve project success. Many successful project managers have understood the importance of maintaining strong political ties as one method to attain project success. They are aware that politics, used prudently, can have a significant positive impact on the implementation of their projects. Block (1983: p.21) defined project politics as “the actions and interactions between project team members and people outside the team that have impact on the success of the project”. In this case, the project manager is the focal point of the interaction and he or she needs to interact with people outside his or her direct control who have impact on project success.

Ferris et al. (2005, 2007) proposed four key dimensions of the political skill construct:

#### *Social astuteness*

It is argued that people with high political skill are astute observers of others and they are attuned to diverse social situations. These people understand social interactions and accurately interpret their behaviour and others in social settings. They are also sensitive to others, thus they are considered to be ingenious and clever in dealing with others. In short,

people with high social astuteness show an accurate understanding of social situations and interpersonal interactions that take place in those settings.

#### *Interpersonal influence*

Another characteristic of people with high political skill is their convincing personal style that exerts a strong influence to people around them. They are flexible and they can appropriately adapt their behaviour to each situation in order to extract certain responses from others. This component is different from the interpersonal skill in the human skill construct. Interpersonal skill basically indicates an ability to build relationships and get along with others, while interpersonal influence is the secret to manipulate interpersonal relationships with others to ensure the ultimate success of a project or organisation (Peled, 2000).

#### *Networking ability*

An important aspect in the political skill is the ability to develop and use diverse networks of people. People included in the networks are considered to hold assets considered as valuable and necessary for achieving personal and project goals. People with high networking ability are often expert negotiators, deal makers, and at ease with conflict management.

#### *Apparent sincerity*

High level of integrity, authenticity, sincerity, and genuineness are the perception of others towards people with high political skill. This dimension is the key in influencing others because it focuses on the perceived intentions of certain behaviour exhibitions. In this case, the influence attempts will be successful when there are no ulterior motives behind the behaviour exhibited. People high in apparent sincerity inspire trust and confidence because they do not appear to be manipulative or coercive.

### *4.4 CHPT: Technical skill construct*

The definition of technical skill is “the job-specific knowledge and techniques that are required to perform specific tasks proficiently” (Robbins et al., 2009). Technical skill involves specialised knowledge, analytical ability within that specialty, and facility in the use of the tools and techniques of the specific discipline (Katz, 1974). Based on various literatures, there are six technical skills essential for construction project managers as follow:

#### *Scheduling*

In a construction project, the project manager needs to decide the dates when different activities are to be performed, understand which activities drive other activities, and determine when the activities are due. With this information, the project manager can direct the right resources to the right tasks, communicate available time and shortfalls, and see potential risks that can cause project delay (Farooqui et al., 2008; PMI, 2008; Pritchard, 2001).

#### *Budgeting and cost management*

This component is important to ensure that the project is completed within the approved budget. The first process is to determine the types and quantities of resources needed to

perform various project activities. Then, the next process is to develop cost estimation for all resources and allocate the budget to individual work activities. Lastly, the project manager needs to control changes to the project budget (PMI, 2008).

### *Quality management*

In construction, quality is defined as “meeting or exceeding the requirements established in the design documents” (Jackson, 2004: p. 273). The process of quality management includes identifying relevant quality standards and determining how to meet them, evaluating project performance periodically to provide confidence that the project will meet the standards, and monitoring specific results to determine their compliance with the standards as well as finding ways to eliminate unsatisfactory performance (Farooqui et al., 2008; PMI, 2008).

### *Document and contract administration*

This component involves project manager’s understanding on manner and procedures for implementing construction contracts according to the accepted practices and regulations within the construction industry. Project manager should also understand contractual relationships between each party in the projects and manage different administrative aspects, such as payments, change orders, claims, request for information, and close out documents. In addition, the system for keeping records and reports of everyday activities should be managed carefully (Fisk, 1997).

### *Risk management*

In construction, project managers must be proactive in managing project risks to achieve project objectives. There are five steps in risk management according to ISO 31000:2009 (Standards Australia, 2009):

- Establish the context. The project manager needs to consider all factors including social, economic, legal, technological, and environmental that pose a risk to the project.
- Risk identification. Risks that can arise from project activities and environment need to be identified. This step should answer what can happen, when, where, how, and why.
- Risk analysis to determine the relationship between the probability of a risk occurring and the consequences of the risk. For instance, the project manager can rate each risk as high, medium, or low.
- Risk evaluation. This step is to decide whether a risk is acceptable by ensuring that existing controls and mitigating factors are in place and sufficient.
- Risk treatment. For risks that are unacceptable, action plans must be put in place to control or reduce the risk.

In every step, communication with project stakeholders must be maintained to make sure that all risks have been managed adequately. Each step should also be monitored and reviewed continually throughout project life cycle to update the risk management plan based on the current progress.

### *Procurement management*

Procurement management includes the processes required to attain goods, services, or results needed from external parties or outside the project team. There are four activities that need to

be done in procurement management. First is planning to prepare procurement documents, specify procurement approach, and identify potential external parties. Second is conducting procurement by obtaining submissions from external parties, selecting an external party, and awarding a contract. Third is administration which involves monitoring contract performance and making changes as necessary. Fourth and lastly is closure once each project procurement is completed (PMI, 2008).

## **5 Development of a theoretical framework**

Based on the discussion in the previous sections, a theoretical framework is developed as shown in Figure 2 to demonstrate the complexity of project manager's tasks and the essential skills (CHPT) to manage these tasks. There are five common stages in construction before the project is completed and handed over to the client. These stages are initiation, design, procurement, construction, and commissioning. The objective of these stages is to deliver a project that meets required standards and specifications of time, cost, quality, safety, and sustainability.

‘put Figure two here’

The framework also presents different project stakeholders that can affect the achievement of project objectives, thus their expectations have to be managed. In the organisation level, there are stakeholders, such as top management, bosses, team members, and people from other departments. In addition, the project manager needs to pay attention on the company culture as well as the system and technology used in the organisation. In the construction task environment, the project manager has to consider external stakeholders like consultants, designers, subcontractors, and the client. Other project stakeholders in the construction task environment are government with their laws and regulations, the community that lives around the project, and public that happens to be around the construction site. Lastly, the project manager should also be concerned about external environment that can impact the project, such as economic, political, sociocultural, technology, global condition, and the demographic where the project is built.

The lower part of the framework shows the essential skills project managers should have or develop. In order to manage various aspects and meet project objectives, the project manager should perform his or her roles and functions by utilising four essential skills, namely conceptual, human, political, and technical skill (CHPT construct). The framework also shows components that form each skill construct.

## **6 Conclusion and recommendation for future studies**

Construction project managers are facing complex tasks in day to day basis, thus they need essential skills to manage these tasks. Sixteen previous studies on essential skills drawn from general management, project management, and construction project management literatures are examined. Then, a new set of essential skills namely conceptual, human, political, and technical skill (CHPT construct) is proposed for construction project managers to achieve project success. This study explores each skill in detail and proposes components that form each skill construct. A key contribution of this research is the inclusion of political skill as one of essential skills for construction project managers. Although its importance tends to be overlooked, political skill is crucial to influence others to secure necessary resources to meet project objectives. Project managers also need political skill to interact with people outside his or her direct control who have impact on project success. Many successful project



managers have understood the importance of maintaining strong political ties as one method to attain project success.

The CHPT construct is developed based on previous studies, which also becomes the limitation for this research. Further studies are required to collect empirical data and investigate the impact of CHPT construct towards project performance in construction. Therefore, a theoretical framework demonstrated the complexity of project manager's tasks and the essential skills is developed. It shows various project stakeholders and external factors that can affect the achievement of project objectives, thus they need to be managed by the project manager. The framework serves as a sound foundation for future studies by providing a starting point and a clear direction to explore. Each skill and even each component that form each skill construct could be explored to investigate its impact towards the achievement of project objectives in different project stages. Measuring the effectiveness of the CHPT construct to manage expectations of project stakeholders is another option for future studies. It is also important to identify the most important skill to achieve successful project outcomes at different project stages.

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Table 1 The relationship between the CHPT construct and previous studies

No	Previous studies	Current research			
		Conceptual skill	Human skill	Political skill	Technical skill
<b>A</b>	<b>General management</b>				
1	Katz (1974)	3	2	N/A	1
2	Peterson and Fleet (2004)	2, 3, 7, 8, 9	4, 5, 6	6	1, 10
<b>B</b>	<b>Project management</b>				
3	Gushgari et al. (1997)	4, 6	1, 2, 5	N/A	3
4	El-Sabaa (2001)	2	1	1	3
5	Lientz and Rea (2002)	2, 3, 6, 7, 9	1, 3, 4, 8	N/A	5, 10, 11
6	Lei and Skitmore (2004)	3, 12	2, 4, 5, 10	11	1, 6, 7, 8, 9
7	Gillard and Price (2005)	1, 2, 3	4, 5, 6, 7, 8, 10	4, 6, 7, 9	N/A
8	Brill et al. (2006)	1, 4	2, 5, 6	N/A	3, 4, 7, 8
9	Kerzner (2009)	5, 6, 7, 10	1, 2, 3, 9	N/A	4, 8
10	PMI (2008)	6	1, 2, 3, 4, 8	5, 7	Included
<b>C</b>	<b>Construction project management</b>				
11	Goodwin (1993)	1	2, 3	N/A	4
12	Oduami (2002)	1, 4	2, 3	N/A	N/A
13	Dainty et al. (2003)	3, 7	1, 2, 4, 6, 8, 9	4, 5, 9	N/A
14	Cheng et al. (2005)	5, 6	1, 2, 3, 4	1, 2, 3	N/A
15	Chen et al. (2008)	1, 3, 6	4, 5, 7	7	2
16	Farooqui et al. (2008)	3, 4, 10, 12, 13, 14, 15, 17	2, 5, 7, 8, 9, 11, 17	11	1, 6, 18, 19, 20

Note: Each number indicates the components identified in previous studies as discussed in the “essential skills for construction project managers revisited” section.

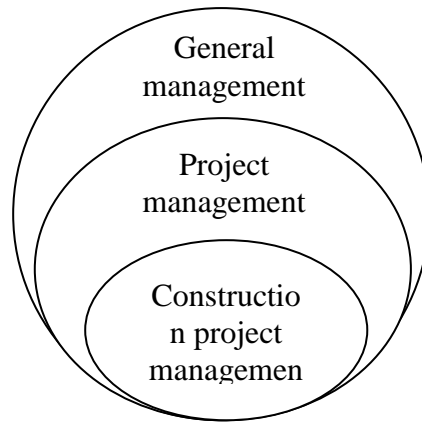


Figure 1 Three knowledge areas

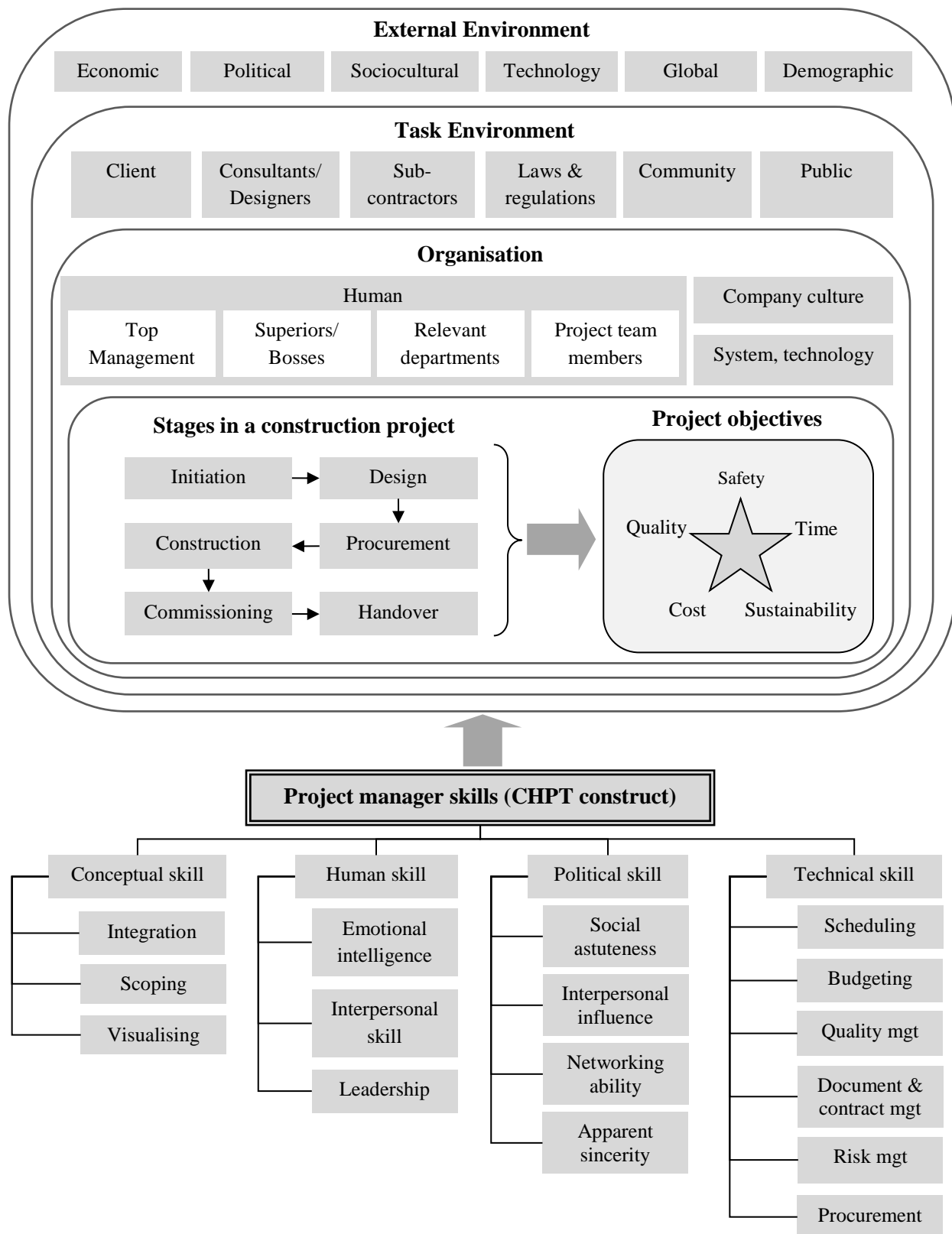


Figure 2 Theoretical framework demonstrating the complexity of project manager's tasks and the essential skills (CHPT construct) to manage those tasks