

IMPACT OF SKILLS, TOOLS AND INNOVATIVENESS ON PROJECT
MANAGERS' EFFECTIVENESS

CHUA SEONG GHEE

UNIVERSITI SAINS MALAYSIA

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ABSTRAK (MALAY)

Objektif kajian ini adalah untuk mengaji kemahiran, bantuan alat and ciri inovasi yang boleh meningkatkan kecekapan pengurus projek. Ini adalah sasaran kajian penyelidikan kuantitatif kepada semua pengurus projek, ketua projek, pengurus dan serta pekerja projek yang bekerja di mana-mana syarikat di Malaysia. Sebanyak 250 soal selidik telah diedarkan melalui e-mel, salinan asal kepada negeri industri utama di Malaysia seperti Pulau Pinang, Kuala Lumpur dan Johor. Sebab itu sebanyak 133 soal selidik atau 53.2% telah dikembalikan dengan maklumat lengkap untuk digunakan bagi analisis statistik. Analisis itu menunjukkan bahawa pengetahuan dan kemahiran seperti kemahiran bukan teknikal, kemahiran teknikal dan kemahiran bermain hijau sebagai peranan penting untuk memacu dan membolehkan pengurus projek yang berkesan. Selain itu, alat dan teknik digunakan semasa projek merancang dan memantau dan mengawal juga menunjukkan sebagai komponen penting dalam menentukan pengurus projek yang berkesan. Walau bagaimanapun, pengurus projek inovasi dimensi dengan ciri-ciri inovator tidak mempunyai pengaruh penting bagi pengurus projek yang berkesan tetapi pengurus projek dengan ciri-ciri penyesuai telah menunjukkan penting untuk menjadi seorang pengurus projek yang berkesan. Kesimpulannya, untuk kekal berdaya saing, pemandu, pemboleh dan cabaran ini adalah penting bagi pengurus projek mana-mana organisasi semasa mengurus dan mengendalikan projek.

ABSTRACT

The purpose of this research is to study the impact of skills, tools and innovativeness on project manager's effectiveness. This is a quantitative research study target to all project managers, project leads, managers and as well as project contributors who work in any company in Malaysia. A total of 250 questionnaires have been distributed via email and hardcopies to the major industry state in Malaysia like Penang, Kuala Lumpur and Johor. Resulted with 133 questionnaires or 53.2% of completed questionnaires had been returned and to be used for statistical analysis. The analysis indicates that in knowledge and skill dimension like soft skill, technical skill and green skill play as importance role to drive and enables the effectiveness of a project manager. Besides, tools and techniques used and applied during project planning, monitoring and controlling also show as significant component in determine effectiveness of a project manager. Surprisingly, in the innovativeness dimension project manager with innovator characteristic show did not have significant influence for an effective project manager however project manager with adaptor characteristic was show significant to be an effective project manager which is contradict with the previous literature study. As a conclusion, in order to remain competitive, the project manager's effectiveness are essential for any organizations when managing and handling projects.

Chapter 1

INTRODUCTION

1.1 Introduction

In today's global business environment, more and more companies are progressively using projects to manage their daily operation in order to accomplish company goals. As the demand on using project is increasingly thus the need of knowledge in the project management has become more and more significant today. Therefore, the person who helps to manage and execute the project for whom we also know as project manager are play in an importance roles. This is because their effectiveness will have direct impact on the success or failure of the project.

Therefore this study will go through and understand the effectiveness of project manager. In this study it shows the relationships among knowledge and skill, tools and techniques, innovativeness and effectiveness of the project managers. The background of study will be explained in next section followed by problem statement that provides brief statement on the issue which the research determines to address. After that, the following section will continue with research objectives and research questions. Definition of key terms section will explain the most frequented used terminology in this research. Then the next section will flow to explain the significance of this study. Finally, the last section provides brief summary on the contents from chapters 2 until chapter 5 in this research.

1.2 Background of the Study

Projects are most often described in terms of plans, resources, tools, organizations, etc. In PMI (2008), a project is defined as a temporary endeavour undertaken to create a unique product, service or results. As the results, we can say that project management is about grouping up the entire area and contribute to the project objective within the scope, time and cost. Therefore the final objective of projects is to achieve utilisation of resources throughout a series of activities or tasks managed by a project manager.

As the results, project manager will play in an importance role in project management. Project manager is responsible to achieve this objective through the application of knowledge, skills, tools, and techniques in the project activities - also known as project management (PMI, 2008). Project management appears to affect the success of an organization and as a result, most corporate companies start to pursue project management as an importance activity to manage their operations and expansion.

In a project life cycle, the project manager undertakes the project management methodology by leading and managing the team to achieve the objective within the targeted schedule, cost and scope. Usually, the project management methodology incorporates several stages. According to PMI (2008), there are five process groups namely initiating, planning, executing, monitoring & controlling and closing. In the past, the research on project management mostly focus on the success criteria, success factor and the used of project management method. Besides, several surveys had been done

toward the success criteria of a project management. As the results, budget, cost, schedule and client requirements had been determined as the success criteria (Belassia & Tukelb, 1996; Westerveld, 2003; White & Fortune, 2002). In addition, time management, cost management, risk management, management support and change control process had been classified as the success factors for the project management (Belassia & Tukelb, 1996; Crawford, Pollack, & England, 2006; Fortune & White, 2006; Westerveld, 2003; White & Fortune, 2002). Thus, limited of study contributed between project management and effectiveness of a project manager.

González & Guillén (2002) state that an ethical and efficient project manager will help to maintain a high standard of quality products. This is because the efficient project manager is able to plan in detail and foresee possible risks while preparing the project management plans ethically. As a result, there is a positive and realistic degree of optimism towards a well-accepted project plans to ensure project success (Smith, Bruyns, & Evans, 2011). Further, an effective project manager needs to have good communication among the team members. Toor & Ogunalana (2009) show that lack and poor of communication in the team can lead to misunderstandings and possible negative impact on the team's performance as well as the firm. Therefore, conflict can be minimized by increasing the delivery of the projects on time and keep the clients informed and satisfied. In return, this can trigger bigger projects for the firm in the future. (Stevenson & Starkweather, 2010) highlight that an effective project manager's competency is the key factor influencing the eventual outcome of the project; with the ability to overcome unexpected events such as the change of business direction, project

scope, timeline, and so on. Thus, Small & Dickie (1999) propose that an effective manager is the most beneficial asset to an organization; helping the business be more sustainable in the long term.

1.3 Problem Statement

In the past research, most of the researches were focused on the correlation between project success factors and ability to handle multiple complex projects toward the core competencies of the project managers (Alam, Gale, Brown, & Khan, 2010; Azim et al., 2010; Caird, 1994; Jacques, Garger, & Thomas, 2008). Not many researchers study the relationship between the core competencies (such as knowledge, skills, and innovativeness) and the effectiveness of project managers. Therefore, the key problem is a good project management practices do not necessary will reflect the successfulness of a project. This is because the key problem is the project manager, the one who handle and manage the project. Therefore, the effectiveness of a project manager will become an important aspect to be exanimate. In addition, most previous studies related to project managers are conducted in other parts of the world (Alam, et al., 2010; Azim, et al., 2010; Caird, 1994; Green & McCann, 2011; M. Kirton, 1984) and not many done on project managers who work in Malaysia.

Hence, the motivation for this study is to fill the existing gap in research by examining the effectiveness of project managers working in Malaysia in terms of knowledge, skills, usage of tools and techniques, and innovativeness.

1.4 Research Objectives

1. To examine the level of core competency of project managers in Malaysia
2. To examine the relationship between knowledge and skills and the effectiveness of project managers in Malaysia
3. To examine the relationship between tools and techniques and the effectiveness of project managers in Malaysia
4. To examine the relationship between innovativeness and the effectiveness of project managers in Malaysia

1.5 Research Questions

1. What is the level of core competency of project managers in Malaysia?
2. What is the relationship between knowledge and skills and the effectiveness of project managers in Malaysia?
3. What is the relationship between tools and techniques and the effectiveness of project managers in Malaysia?
4. What is the relationship between innovativeness and the effectiveness of project managers in Malaysia?

1.6 Significance of the Study

The outcome of this study is significant to companies that undertake project management whereby they will be able to have a better profile on the effectiveness of project managers. Besides, this can help them to have a better understanding on the core

competency necessary to be an effective project manager. At the same time, it also will help the companies to have a better design on the development path for their project managers and provide necessary training, assistant and working environment so that they able to perform at the most effective manner; and thereby ensuring project success.

In addition, the outcome of this study can also help current / potential project managers to better equip themselves with the necessary core competencies in order to be more effective and successful. Finally, the outcome of this study can reveal the level of core competency of project managers in Malaysia

1.7 Definition of Key Terms

For the purpose of this study, the following definition for some of the key terms that frequently used is referred to specifically to enhance understanding of the study:

- **APM:** APM stand for Association for Project Management. Their key objective is to build up and support the professional disciplines of project management and programme management through a programme called the "Five Dimensions of Professionalism". (APM, 2006)
- **PMI:** The Project Management Institute (PMI) is a not-for-profit professional organization for the project management profession with the purpose of advancing project management. (PMI, 2008)

- **IPMA:** The International Project Management Association (IPMA) is a non-profit, Swiss-registered organization for the promotion of project management internationally. IPMA's focus is in the development and promotion of the project management profession. It provides standards and establishes guidelines for the work of project management professionals through the IPMA Competence Baseline (ICB). (IPMA, 2006)

- **PMBOK:** A Guide to the Project Management Body of Knowledge (PMBOK Guide) is a book which presents a set of standard terminology and guidelines for project management. The PMBOK Guide is process-based. Therefore PMBOK was used to explain most of the task which get done by processes. Besides, this approach also works together with other management standards such as ISO 9000 and the Software Engineering Institute's CMMI. (PMI, 2008)

- **Soft Skill:** A specific skills which enable a person to be effective in a group and as well as to build a mutual trust within the team he leads (El-Sabaa, 2001).

- **Technical Skill:** A specific skill equipped by a person such as technical knowledge, scientific management principles, the usage of tools and tangible outputs (Ira Pant, 2008).

- **Green Skill:** A specific of skills which will be essential for the growth of the green economy such as knowledge of sustainable materials, carbon foot-printing

skills and environmental impact assessment skills (Slingenberg, Rademaekers, Sincer, & A, 2008).

- ***Project Planning:*** This is a process where the entire project scope and the resources as well as effort needed for the project will be determined. Besides, the project objectives will be refined and action for achieve the project objectives will identify. (PMI, 2008)
- ***Project Monitoring and Controlling:*** This is a process where the project manager will perform an audit, review, and keep track of the process and status of the project. Besides, they also need to alert and trigger proper changes if there is a need for it. (PMI, 2008)
- ***Innovator:*** A person who generally prefer new challenges, look for change or reconstruct the problem and do not like routine work. (Cramera & Reijenga, 1999)
- ***Adaptor:*** A person who prefer to work out the detail of innovator idea. Besides, they are not a risk taker (Cramera & Reijenga, 1999).

1.8 Organizing of Remaining Chapters

Current chapter was organized as introduction chapter. While the rest of the thesis was structured as follow: Chapter 2 will cover the literature review on an effective project manager relating to this research. After that, the chapter will follow by theoretical

framework and the development of the hypotheses based on the literature review. Chapter 3 will focus on the explanation on how the data and variable used for the study through the analytical framework. Subsequently, all of the finding in Chapter 3 will be interpreted on Chapter 4. On Chapter 4, the data interpretation will performed based on the data obtained through the questionnaires and analysis done via SPSS statistical tools. Last but not least, Chapter 5 will focus on the discussion on the results. Therefore, the findings of the research are discussed in context of the research implication, limitation faced during the research, further suggestion on the future research and end with the conclusion.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

The primary focus of this research is centred upon the effectiveness of the project managers. So the literature reviews present the variables on knowledge and skills, tools and techniques, innovativeness, and effectiveness.

2.1.1 Knowledge and Skills

Soft Skills and Technical Skills

Is soft skills and technical skills play in a vital role for a project manager? I believe this a hot topic which had been discussed from the past. If it was so important, will both soft skills and technical skills help to increase the effectiveness of a project manager? From the study by Alam, Gale, Brown, & Khan (2010), they proof that soft skills not only help project managers to be more effective but are also necessary to train the future project managers. This is because most of the organizations are focus on provides technical skill training therefore less focus on the soft skill. As the result, we should not only provide technical skills training for the project manager but also soft skills. Therefore they strongly emphasize the usefulness of the soft skills. In Azim (2010) research, he demonstrated that the usefulness of soft skill to help the project manager not only handle simple project but as well as complex project. Besides, Azim (2010) further justified soft skills not only help to increase the effectiveness for a project manager who usually handle single project but also in the situation where a project manager are

concurrently handle multiple project. From his study, he reveals that the value of soft skills in helping a project manager to be more competent. Beside there are also study show that those project managers who are good in built up the knowledge and skills would most likely helped them to position themselves for future career success (El-Sabaa, 2001). This eventually further justified the significant of soft skill toward the effectiveness of project manager.

From time to time, we notice that most of the academic study are lack emphasize on soft skill, therefore there is study about the importance of human or soft skills that will help to project manager to bring the success of the project management further done by Ira Pant (2008). At the same time, according to the research by Fisher (2011), in order to make an effective project manager, people management skill is the most important then behaviours will drive the outcome. Therefore, a set of specific soft skills and associated behaviours had been identified throughout their research. As the result, we can see that both Ira Pant (2008) and Fisher (2011) further support the literature review in the past on the significant of soft skill in helping the project manager to be more effective.

Besides taking soft skills as overall, there are many study demonstrate that leadership skills are one of the important soft skill which we need to be seriously take note. Therefore a research study on the project manager leadership throughout various level groups of people had been done. The study started with the student from project management and MBA. Both group show that leadership skill was play in a very

important roles (Jacques, et al., 2008). After that, this statement was further supported by another research by Cleland (1995). Besides, the researcher also suggests that the project management body of knowledge should more emphasize the importance of soft skill and as well as a more expansive discussion should be done rather than too focusing on the technical aspect (Cleland, 1995). The statement done by Cleland (1995) is true in the sense that, if the project manager is competent on the technical aspect but lack of soft skill this eventually will not effective to the team. This is because most of the time, project management done by the project manager is more about the people managing skill.

After that, leadership skill was further support and proof that is one of the important soft skills which will significant affecting the project success by the study of Yanga, Huangb & Wua (2011). From their research study, they examine how the project manager's leadership style will build up the teamwork and as well as project success. As the result of the study, it demonstrate that an increase in the level of leadership it may enhance the team member spirit and motivation. Consequently it will lead to the project performance. Besides, there is also another research on toward project manager on 21st century (Lloyd-Walkera & Walkerb, 2011). The result indicates that 21st century project managers will need Authentic Leadership skills. Therefore it further justified that the importance of soft skills as a part of a success and effective project manager. As we know that, an effective team required a good leader. Therefore, in order for a project manager to effectively manage and lead the team to achieve success thus leadership skill is very important for a project manager.

Besides leadership skill, communication skill also part of the important soft skill for project managers. From the study by Henderson (2004) on communication skill. It shows that the project managers' competencies in communication are significantly associate with the team member satisfaction this is because most of the time the project managers are involved in communication. Therefore, project managers who can communicate effective with their team member will eventually easy achieve mutual agreement and create synergy among the team member thus less conflict occurs in the team. As the result, this will help project manager to be more effective to lead the project to success. On the other hand, the study from Wateridge (1997) indicate that both soft skills and technical skills are equally important. Thus training should provide to the project managers therefore they able to apply the skill and can go a long way to make project successful. This finding also supported by the research done by Rosea, Pedersena, Hosbonda & Kraemmergaardb (2007).

Table 2.1

Summary of Soft Skills and Technical Skills Literature Review

Researchers	Research Focus
Alam, Gale, Brown, & Khan (2010)	Importance of soft skills for a project manager
Fisher (2011)	
Azim (2010)	
Ira Pant (2008)	Both technical skill and soft skill have influence on

El-Sabaa (2001)	the effectiveness of a project manager
Jacques, Garger & Thomas (2008)	Leaderships skills as one of the importance soft skills for project manager
Cleland (1995)	
Yanga, Huangb & Wua (2011)	
Lloyd-Walkera & Walkerb (2011)	
Henderson (2004)	Communication skills as one of the importance soft skills for project manager
Wateridge (1997)	
Rosea, Pedersena, Hosbonda & Kraemmergaardb (2007)	

Green Skills

In addition, Green & McCann (2011) argue for the need to develop “green skills” on project managers to enhance their ability to lead the team in a green economy. Similarly, Chen (2011) supports this by proven that environmental leadership are positively associate with green organizational identity and green competitive advantage. This is because, green skill like environmental leadership are critical especially when they execute green economy project. Let say, if project managers who lack of green skill such as environmental leadership that will be hard for them to be effectively manage green economy project. This is because time and cost will be the main concern for typical project manager whereas sustainability and ethical will be the main concern for the environmental leadership. Therefore, we can see that, project manager who equip with green skills seek for long term sustainability rather than complete the project as soon as possible with the minimum time and lowest cost.

Further, González & Guillén (2002) conclude that ethical is powerful for sustainable management. Besides, there is another research done on leader ethical and effectiveness base on perceived leader integrity scale (PLIS) by Craig and Gustafson (1998). The relationship between effectiveness and leader ethical behaviour was examined by using the perceived leader integrity scale (PLIS). The result is positively significant. Besides, there is another similar study by Parry and Proctor-Thomson (2002) which investigate the role of leaders' ethical integrity in their effectiveness. Thus, it further supports the importance of ethical as importance green skills for a project manager. But on the other way round, is it ethical skill really a concern by the current project manager? The answer would be yes, according to Parry and Proctor-Thomson (2002), they conclude that ethical integrity is an importance factor of an effective leadership. The reason for this is because when a project manager manages his/her project ethically they will eventually work with care and understand to their subordinates, company and customers. Thus, directly they will gain respect and appreciate from all of the parties. Therefore, green skills can increase effectiveness of project managers.

Besides, there are another study done by Mishra, Dangayach and Mittal (2011), they further justified the statement by identified ethics as one of the importance skills in the projectized organizations. Base on their study, ethics will result in sustainability of the project. Thus, it will increase the values and morality among the team members. As the result, the effectiveness of the team as well as project manager will be significant improved. This is further support that, how the ethical project manager will create a better team spirit and help to lift up the team to achieve better.

Table 2.2

Summary of Green Skills Literature Review

Researchers	Research Focus
Green & McCann (2011)	Environmental leadership as an importance green skills
Chen (2011)	
González & Guillén (2002)	Effectiveness of a project manager affected by the green skills (ethical behaviours)
Craig & Gustafson (1998)	
Parry & Proctor-Thomson (2002)	
Mishra, Dangayach and Mittal (2011)	

2.1.2 Tools and Techniques

Process Group

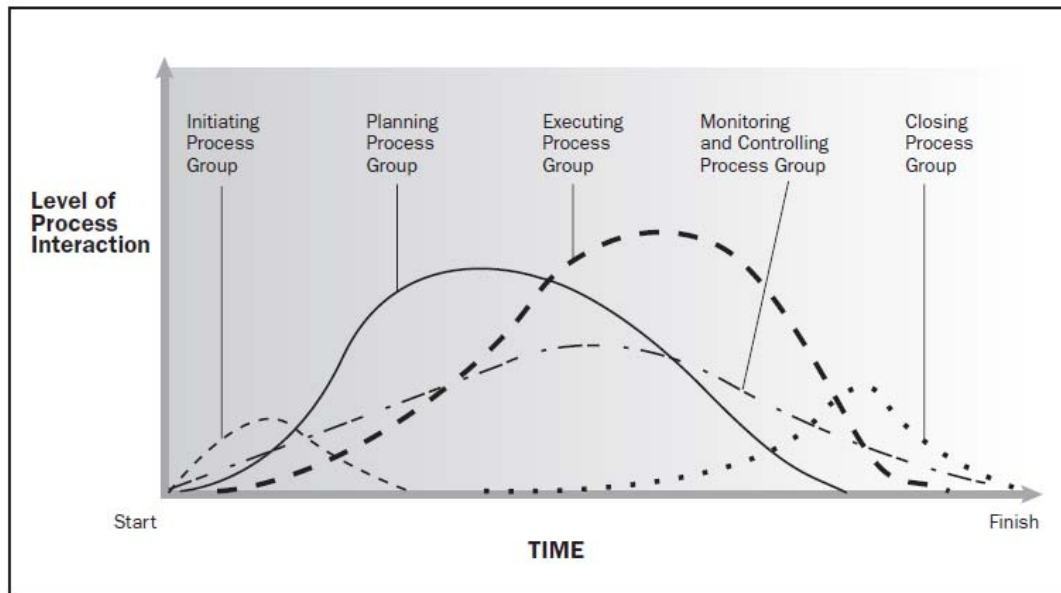


Figure 2.1. Process Group in Project Life Cycle (PMI, 2008).

PMBok defined process as a set of interconnected actions and activities performed to achieve a pre-specified product, result or service (PMI, 2008). Therefore,

the tools and techniques had been identified as the input of the process which the project manager and can be used and applied to result the output. Initiating, planning, executing, monitoring and controlling and as well as closing process group had been defined by PMI (2008) as five importance process group. As from figure 2.1, it illustrated the level of process interaction in each of the process group since the project started until the project finished. Below are the definitions for each of the process group by PMBoK.

Table 2.3

PMBOK Process Group (PMI, 2008)

Project Process Phases	Definition
Project Initiating	Is a processes used to define a new project or the process on obtaining an authorization to kick off a new project or phase.
Project Planning	This is a process where the project scope will be established. Besides, the objectives will be refine and determine the action required to achieve the project objectives.
Project Executing	This is a process where the work will be carried out to complete the work which had been identified.
Project Monitoring and Controlling	This is a process where the project manager will perform an audit, review, and keep track of the process and status of the project. Besides, they also need to alert and trigger proper changes if there is a need for it.
Project Closing	This will be the process to conclude all activities throughout the entire process groups and to formally close the project or

	phase.
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Although there are five processes group defined in PMBok, but in this study we are only focus on tools and techniques used and applied on two major importance processes group which are project planning and project monitoring and controlling.

Project Planning, Monitoring and Controlling

In today's business, project managers are provided with various tools and techniques that would increase the effectiveness during the project life cycle. According to Patanakul(2010), the project success has significant relationship with the usage and application of the appropriate tools and techniques. Even with the help from project management software and structured approaches, there will be occasions when projects fail to meet the targeted deadlines and budgets. Therefore, competencies of skills still play in a vital role. Additionally, Potts(2010) argues that usage of appropriate project management tools and techniques generally reduce the risks of not meeting the deadlines, etc. This is true to said that those project management tools and techniques will help in recording and make all the work more organized. Beside, project management tools and techniques might able to serve as start-up kits and guidance for less experience project manager to draft out the initial step. By managing the tools and techniques, it will eventually help to build up the efficiency and effectiveness of the project manager.

Ali (2008) highlights that, project success is ensuring when project managers are adequately trained to use relevant project management tools and techniques. We are agreed that as there are many different tools in the market. Therefore, it is importance for a project manager to really understand type of tools he need then proceed with the proper training in order to know a better knowledge to use and applied the tools and techniques.

Murphy & Ledwith (2007) focus on project management tools and techniques such as Microsoft Project, Critical Path Methodology (CPM), Gantt Chart, Work Breakdown Structure (WBS), etc., All of the tools, are proven to be helpful in different stage of project management. Therefore, with a proper understand on the techniques it would eventually help to increase the effectiveness of a project manager. On the other hand, the statement was further supported by Shtub (1997), as a deep research done by Shtub on Critical Path Methodology. It shows that CPM is suitable for all type of project especially on budgeting and costing.

Ika, Diallo, & Thuillier (2009) propose that tools and techniques that would help to increase the effectiveness of a project manager such as planning, monitoring and controlling tools. This statement also support by Dvira, Razb & Shenhar (2003), according to their study project success are positively correlation with the effectiveness of a project manager during project planning, requirement gathering. Besides, it further justified by study done by Ebert (1999) on the tools and technique use by a project

manager on project controlling will eventually having a better control on the project and as well as project improvement.

From the study of Gowan, Mathieu, & Hey (2006), they stated that earned value management was one of the importance tools and technique which will help to increase the effectiveness of a project manager in managing the project scope by tracking it and measures the actual performance rather than only at milestones. Besides, Vandevordea & Vanhoucke (2006) also agreed that earned value management was one of the importance tools that can help project manager to be more effective especially when monitoring the project progress to ensure the project is on track. On the other way round, Kima, Jr. & Duffey (2003) suggest that, although earn value management will lead to better outcome for the project as well as the effectiveness of a project manager during the project cycle such as project planning, monitoring and controlling but some other importance criteria also need to be taking care such as organization culture, effective training provide to the project manager on the earn value management, facilitating support system and etc.

Besides earned value management, WBS was also recognize as an importance tools and techniques for project manager to be effectively manage large scale project (Bachy & Hameri, 1997). The importance of WBS was further supported by Hilla, Thomasa & Allen (2000). Base on their research, by use WBS at the lower level when the project manager estimate the schedule will eventually help the project have better and

accurate estimation and planning as well as monitoring the progress and controlling the variance. Both earn value management and WBS were also research and study by Vanhouche (2012) and conclude that by understand and proper used of these tools in project planning and controlling will eventually increase the effectiveness of a project manager.

There is another study on project management tools and techniques done by Raymonda & Bergeron (2008). From their study they proposed that Project management information systems (PMIS) able to help the project manager with the decision-making support needed in various areas such as planning, monitoring, and controlling projects. As the result, the improvement in effectiveness and efficiency for the project manager was showing significant relationship. Beside from the study done by Raymonda & Bergeron, the usefulness of PMIS as a tools and technique to help in increasing the effectiveness of a project manager of also further support by Caniel (2012). At the same time in Zwikael & Globerson (2006) research they also agreed that with the purchase of project management software as a tools and techniques it will significantly help the project manager to have a better control in term of planning and controlling on their project. Subsequently, increase the project quality and reduce the cost and schedule overruns.

Although number of study agreed with tools and techniques that would increase the effectiveness of project managers but there are some contradict point of view based

on the research done by Rose, Pedersen, Hosbond & Kræmmergaard (2007). According to their research, although tools and techniques might help in increase the effectiveness but the competency of the project manager would be play in the more importance roles.

Table 2.4

Summary of Tools and Techniques used in Project Planning, Monitoring and Controlling Literature Review

Researchers	Research Focus
Patanakul (2010)	Used of appropriate project management tools and techniques would increase the effectiveness of the project manager during project planning, monitoring and controlling
Potts (2010)	
Ali, Anbari, & Money (2008)	
Murphy & Ledwith (2007)	
Ika, Diallo, & Thuillier (2009)	
Dvira, Razb & Shenhar (2003)	
Ebert (1999)	Used of CPM (Critical Path Methodology) as a tools and techniques during project planning to increase effectiveness of a project manager
Shtub (1997)	
Gowan, Mathieu, & Hey (2006)	Earned Value Management as an importance tools and techniques to be used by project manager during project
Vandevoordea & Vanhoucke (2006)	
Kima, Jr. & Duffey (2003)	

	planning, monitoring and controlling
Bachy & Hameri (1997)	WBS (Work Breakdown Structure) was recognize as an importance tools and techniques for project manager to be effectively manage project
Hilla, Thomasa & Allen (2000)	
Vanhouche (2012)	
Raymonda & Bergeron (2008)	PMIS (Project Management Information System) as a tools and technique to help in increasing the effectiveness of a project manager
Caniëls (2012)	
Zwikaël & Globerson (2006)	
Rose, Pedersen, Hosbond & Kræmmergaard (2007)	Competency of the project manager is more importance than tools and techniques.

2.1.3 Innovativeness

Innovator

There are a number of studies done with regards to the characteristics of an innovator such as thinking style, creativity, problem solving, and decision-making. Kirton (2003) noted that “The Adaption-Innovation Theory is founded on the assumption that all people solve problems and are creative”. Besides, Kirton (1984) describes ‘innovators’ to be less concerned with ‘doing things better’ than with ‘doing things differently’. Caird (1994) finds that courageous, capable, motivated, persistent, ability to relate and optimistic are the general innovator’s personal characteristics. Tuilett (1996) proposes

that innovativeness of project managers make importance contributions to improve their efficiency while managing multiple projects.

Kirton originally defined innovator with the follow descriptors:

- (a) Seemingly undisciplined, approaching tasks from unsuspected angles,
- (b) Tends to take control in unstructured situations,
- (c) Capable of detailed tasks only in short bursts,
- (d) Often challenges rules
- (e) Having low self-doubt when generating ideas.

Adaptor

Adaptor, by contrast, are described by Kirton (1984) as “doing things better”. This is because they prefer to work on existing agreed definition of the problem once they produce sufficiency of ideas. Another study show that, when problem solving, adaptors will vote for more structure. Throughout their observation, structure that is consensually agreed will be more favourable by adaptors (Buffinton, Jablokow, & Martin, 2002).

Kirton originally defined adaptors with the follow descriptors:

- (a) Concerned with solving problems rather than finding them,
- (b) Seeking solutions to problems in tried and understood ways,
- (c) Maintaining high accuracy in long spells of detailed work,