TACTICS FOR GUIDING SOFTWARE DEVELOPMENT OUTSOURCING TO SUCCESS

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Nowadays, more and more companies outsource their software development projects to third parties. Cost saving, focusing on companies' core competencies, controlling operating costs, acquiring internally scarce resources, accessing to professional capabilities and sharing the risks are the reasons contributed to the continued growth of software development projects outsourcing. This kind of outsourcing is growing, evolving and changing.

With the above changes, success factors which were identified in the past may not be applicable in this era of dynamic change. Moreover, diversify sets of critical success factors in software development project management were identified in different studies due to scholars' different perspectives on project success. Updating and ranking of success factors of software development projects are essential. This study seeks to provide a set of life-cycle centric success factors for outsourced software development projects that could be served as guidance for both clients and vendors.

Keywords:

Project Management, Success Factors, Outsourcing

1. INTRODUCTION

The role of Information Technology (IT) / Systems (IS) (the terms IT and IS will be used interchangeably throughout this text) started to evolve from 1960s. At that time, IT equipments and experts who were responsible to maintain the systems were very expensive, so sharing the expenses with others (economies of scale) became more feasible. This is the first wave of the IT outsourcing which included hardware outsourcing and provision of Electronic Data Processing (EDP) services bureaus. Later, in 1980s and 1990s, with the advancement in technology, the cost of hardware became widely affordable. Many firms treated IT as strategic tools and have their own IS department/team to develop, maintain and manage their own systems. Today, IT is widely adopted in business environments and some even became as common as commodities that are acting as supporting roles in the business world.

Focus on core business and decline in non-core areas is the rule of thumb of outsourcing (Lee, Huynh et al. 2003). It is not surprising that more and more IT related functions have been outsourced to third parties. Those outsourcing activities can basically be classified as *Business Process Outsourcing (BPO)*, *Complete Outsourcing of IS*, *Partial Outsourcing of IS* and *Outsourcing of IS Development*. (Feuerlicht and Voøíšek 2003). In terms of percentage growth, software development outsourcing ranked number one among the eight major categories of IT outsourcing that are *data center operations outsourcing*, *desktop support outsourcing*, *help desk outsourcing*, s*oftware development outsourcing*, *website/e-commerce outsourcing*, *hosted applications* (software as a service), *network operations outsourcing*, and *disaster recovery services outsourcing* (Computer Economics Inc. 2006).

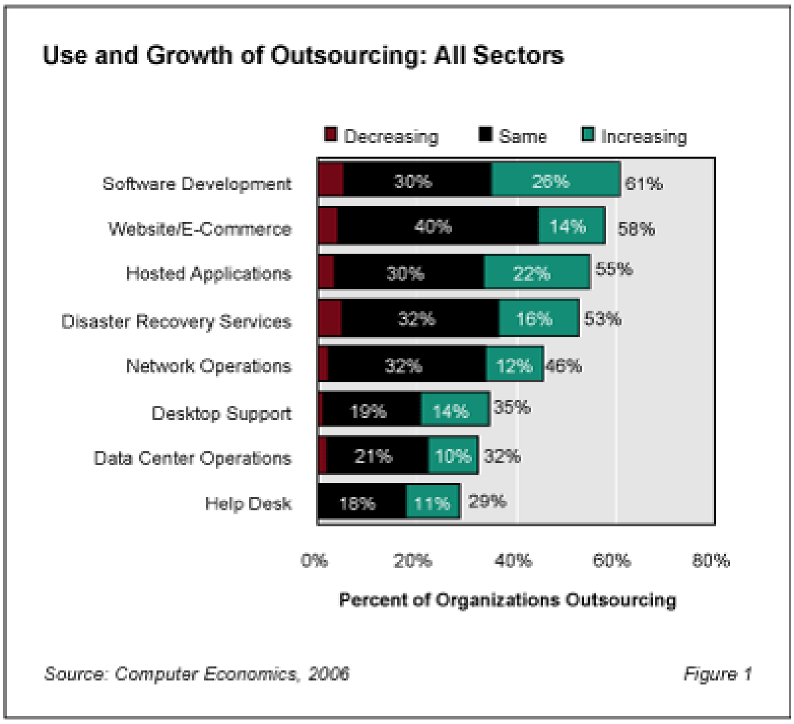

Figure 1 Growth of Outsourcing (source: Computer Economic 2006)

This shows that software development is the most popular category of IT outsourcing. The fast growing percentage indicates that the software development outsourcing activities still in an exploration stage. It needs more guidance to mature.

In addition, many evidences showed that IT outsourcing has a high failure rate (Overby 2003). Clients are not satisfied with the outsourcing outcomes so that contracts were terminated before its completion. A survey conducted by Compass America revealed that 96% executives who have outsourced IT functions would consider repatriation of the services (Fowler 2006). They wanted to insource a significant portion of those outsourced projects/services once the contracts expired. These actions made both clients and vendors headache. Factors that contribute to outsourced project success are in demand.

Our research is aiming at identifying the tactics (referred as Critical/Key Success Factors in literatures) that could provide guidance in managing outsourced software development projects more effectively. This study extended the project management literatures by taking outsourcing factors into considerations.

This paper is organized as follows. Section 2 provides the theoretical background for this study and Section 3 describes the significance of this study.

2. THEORETICAL BACKGROUND

Several key concepts, like *project life cycle*, *success criteria* and *key success factors*, would be covered in this section.

2.1 Software Development Project Life Cycle

A typical software development project life cycle consists of four phases: (I) C*onceptual*, (II) *Planning*, (III) *Execution* and (IV) *Termination* (Cleland and King 1988; Marchewka 2003). Conceptualization, goal identification, feasibility studies are performed in the conceptual phase. All planning activities, such as determination of cost, schedule, performance and resource requirements, are gone into the planning phase. Systems are built and developed in the execution phase. And finally the project terminated by releasing resources, training personnel and reassigning project team members (Marchewka 2003).

Differences in life cycle between outsourced and non-outsourced software development projects are mainly found in the Conceptual and Planning Phases whereby vendors have to be identified before the project initiated and transited. Extra activities regarding the vendors selection have to be performed both in Phases I & II (Beck 2002). Clients would issue a request for proposal (RFP) and wait for vendors' replies. Then, vendors would be assessed and selected based on their proposal. After negotiations, contract would be developed and signed (Power, Desouza et al. 2006). The project starts to transit to the vendor after the contract has been signed. The client monitors the progresses, while the vendor is developing the software. Once the development completed, deliverables and responsibilities have to be transferred to the client. The transition process is more complicated than that of in-house development projects. The transition becomes even more complicated if it is an offshore outsourced project (Ware 2003). More cautions are needed in the termination phase. By comparing the life cycle of outsourced and in-house software development projects, it is apparent that both the focuses and the resources spent are different in each phase. Figure 2 compared the level of effort spent in each phase.

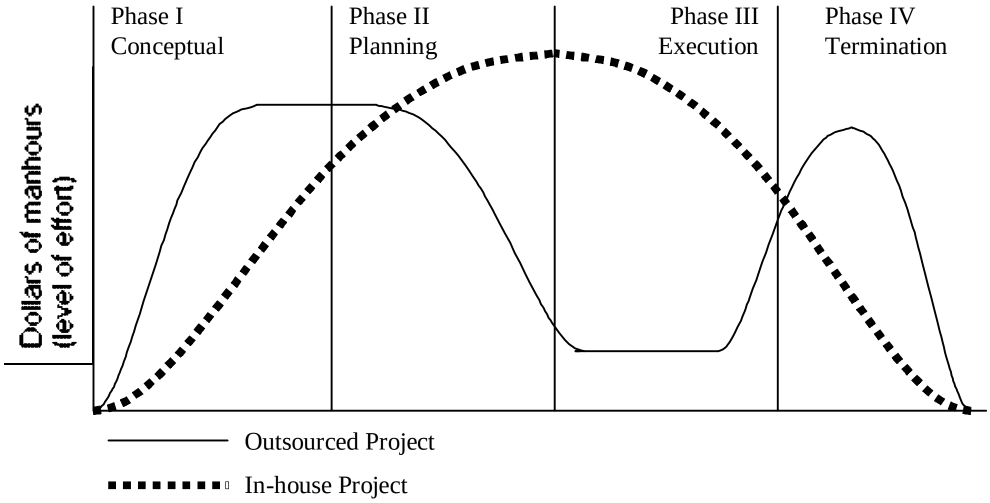

Figure 2 Comparison in man-hours spent in different phases of software development project life cycles

With these differences, success factors for project management that are founded in the literature may not be applicable in the outsourcing context. Before identifying success factors/tactics, success criteria should be defined first, since success criteria serve as a measurement of project success.

2.2 Macro and Micro Viewpoint on Project Success

The chaotic situation appeared in the critical success factors (CSFs) of software development projects literatures. The main reason is due to the diversified perspectives on project success. Early studies of project success from an operational perspective associated success narrowly with the project life cycle itself, so the assessment variables were focused on time, cost and scope (Atkinson 1999). These three variables were known as the "iron-triangle". Later, some scholars argued that project success should not only be assessed by project life cycle activities, but also consider cultural, structural, practical and interpersonal aspects (Cleland & Ireland 2002). Jugdev et al. (2005) quoted the definitions of project and product life cycles from PMBOKÒ Guide (A Guide to the Project Management Body of Knowledge) to indicate how previous studies had narrowly defined their views on project success (Jugdev & Muller 2005).

The PMBOKÒ Guide defines project life cycle as: "A collection of generally sequential project phases whose name and number are determined by the control needs of the organization or organizations involved in the project" (Project Management Institute 2000). Project life cycle is a subset of the product life cycle, which typically includes an initial phase, intermediate phase, final phase, operational phase and decommissioning phase. Table 1 illustrated the project and product life cycle.

Table 1 Overview of the project and product life cycle (Jugdev et al)

	Phases		Software Development
Product Life Cycle	**Initial Phase:** Conceptualization, Planning	Project Life Cycle	Proof of Concept Cycle
	Intermediate Phase: Production/Implementation		First Build Cycle Second Build Cycle
	Final Phase: Handover		Final Cycle Including Testing, Final Build
	Operations: Utilization		Deployment
	Decommissioning: Closedown		

Literatures on project success determination could be divided into two streams: one is measured by the project management outcomes only at the end of project life cycle, while the others measure success during operational and decommissioning phase by taking different stakeholders into account, so that the measurements have clearer connections to product usage and business values (Atkinson 1999). Cooke-Davies (2002) draws a line between *project management success* and *project success* (Cooke-Davies 2002). Project management success is assessed upon project completion by using the "iron-triangle"— time, cost and scope. These measurements focused on project achievements in smaller component levels, so it is being regarded as a micro viewpoint of project success.

On the contrary, project success includes another set of criteria; such as achieving original project concepts, meeting the overall objectives, and satisfying the participants. These assessments could only be conducted beyond the project life cycle. With such longer range perspectives, project success is considered as a macro viewpoint of project success.

Different participants of the same project would have different perspectives on project success. Generally, the project owner and users declare a project success from the macro viewpoint, while the developer and contractor(s) proclaiming a project success from a micro viewpoint (Cooke-Davies 2002; Lim & Mohamed 1999; Wateridge 1998). It is not unusual that incoherent conclusions would be drawn form these two groups of people. Sometimes users satisfied with the project outcomes and regarded the project as success, but developers judged it as a failure due to delay or over budget. Occasionally, developers satisfied with the projects, but users did not. One typically example is the *Sydney Opera House* project which took 15 years (1958-1973) to build and was 14 times over budget (from A$ 7 million to A$ 102 million). From the micro viewpoint, this project is a failure since it was over budget 14 times, but from the macro viewpoint, it is a successful project, since it's an engineering masterpiece – the symbol of Sydney (Jugdev and Muller 2005; Lim & Mohamed 1999).

This example demonstrated that different participants and the general publics may assess the same project outcome in different ways (Morris & Hough 1987). It is difficult to have an absolute definition of project success, so in this study we would select our own set of success criteria from the relevant literatures to define "projects success".

2.3 Project Success Criteria

Before identifying success factors/tactics, we have to define what "successful projects" are? Success criteria have long been studied since 1980s. Lim and Mohamed (1999) defines success criteria as "……set of principles or standards by which project success is or can be judged. These are the conditions on which judgment can be made". Rook (1986) stated the most preliminary success criteria which are "*on time*", "*within budget*" and "*to specification*". Obviously, it is difficult to accept that a software development project is claimed to be success even if it has budget overruns, delays and incongruities with the specifications. These three success criteria have been included in our assessment.

Baker et al. (1983) and Wateridge (1998) proposed the term "perceived success of a project" which suggested various key people on the project (e.g. client, project team and users) need to be satisfied with the project outcomes. Block (1983) had the same view as Baker. Block suggested satisfying all the interested parties in the project. Interested parties included users, sponsors, technical participants and other stakeholders.

It is obvious that customers and users would not be satisfied if the deliverables are in bad quality. The quality aspects are correlated with satisfaction. Block (1983) indicates that the project should not only be completed, but also meet certain quality thresholds. Our assessment had included the quality issues, since project deliverables with low quality could not satisfy interested parties that would be regarded as a failure.

Morris and Hough (1987) derived four success criteria form their empirical studies. The four success criteria are "*The project delivers its functionality*", "*The project is implemented to budget, on schedule and to technical specification*", "*The project is commercially profitable for the contractor*" and "*In the event of a cancelled project, was the cancellation made on a reasonable basis and was the project terminated efficiently*". New ideas such as contractor profitability and efficiency project cancellation were included (Morris and Hough 1987). The point of profitability should not be taken into consideration in the outsourcing context. It is obvious that both the sellers and buyers would be benefited from the project otherwise no one would initialize and bid the project.

According to the definition, every project must have an objective.

> A project is "a combination of human and nonhuman resources pulled together in a temporary organization to achieve a specified purpose" (Cleland and Kerzner 1985)

The most preliminary success criterion should be achieving all the objectives originally set for it. Turner (1993) proposed similar success criterion which is "*It meets its pre-stated objectives to produce the facility*". Turner also tried to align project success assessment to business values. One of his suggested success criterion is "*It achieves its stated business purpose*". These two criteria are related to objectives fulfillment.

Wateridge (1998) extended the business purpose and split it into strategically, tactically and operationally and proposed success criteria as:

"*It is profitable for the sponsor/owner and contractors*", "*It achieves its business purpose in three ways (strategically, tactically and operationally)*", "*It meets its defined objectives*", "*It meets quality thresholds*", "*It is produced to specification, within budget and on time*" and "*All parties (users, sponsors, the project team) are happy during the project and with the outcome of the project*" (Wateridge 1998).

Success criteria developed by Wateridge (1998) are relatively comprehensive that included micro and macro viewpoints. Success criteria from macro viewpoints, like objectives fulfillment and overall satisfaction, should be included in our assessment.

To make the success criteria precise and easy to measure, only six success criteria would be included in our assessment model. *On time*, *within budget* and *to specification* would be applied to measure success in our study, since all of them are the fundamental criteria. A project without fulfilling all these requirements could not claim to be a successful project (Project Management Institute 2000).

In addition, the preliminary criteria – objectives fulfillment cannot be omitted in our assessment model. If requirements are captured accurately and the deliverables are adhered to the specifications with good quality control, then business purposes and pre-stated objectives would be achieved simultaneously. It is reasonable to include *assured* *quality* into our assessment model. As mentioned, qualities of project deliverables are related to users' satisfactions (DeLone and McLean 1992). Users will not satisfy with a project if its deliverables are not up to certain standards. Most of the project management books included chapters that are related to quality assurance indicated that quality is a very important assessment index (Pressman 1992; Marchewka 2003; Schwalbe 2006).

Finally, a successful project should be accepted by the users. Project success should include client satisfaction, so we incorporate the overall satisfaction in our assessment. All these six criteria would be applied in our study to assess whether the software development projects are success or not.

2.4 Project Management Success Factors/Tactics

The concept of success/failure factors was first proposed by Rubin and Seeling (1967) in their study to find out whether project managers' experiences would affect project success or not. Their findings revealed that project success is less related to project managers' experiences. At that time, project success was measured by technical performances. The most resplendent period of success factors studies was in mid-1980s. Lots of literatures identified critical success factors at that time.

Kerzner (1987) defines Critical Success Factor (CSF) as "the elements required to created and environment where project are managed consistently with excellence". Kerzner (1987) identified six CSFs which focused on satisfying project stakeholders with less attention on technical aspects. Those identified CSFs are:

"*A corporate understanding of project management by everyone involved*", "*Executive commitment to project management*", "*Organizational adaptability*", "*Project manager selection criteria*", "*Project management leadership style*" and "*A commitment to planning and control*".

Morris and Hough (1987) derived CSFs from their empirical studies of eight large and complex projects. Those projects had common characteristics which were that they all had great impact on economic, but poorly managed and eventually resulted in failure. Eight CSFs were derived from the painful experiences of those complex projects. The eight CSFs are "*Project objectives/definitions*", "*Financial contract legal problems*", "*Schedule duration urgency*", "*Politics*", "*Human quality*", "*Resources management*", "*Technical uncertainty*" and "*Communication and control*". This set of CSFs focuses more on the development life cycle (Morris and Hough 1987).

Pinto et al. (Pinto and Mantel 1990; Pinto and Prescott 1990; Pinto and Slevin 1989) had several publications on success factors. They concluded and developed the well known 10 CSFs. Among the ten factors, three of them were being categorized as planning. They are "*Top management support*", "*Project schedule/plan*", and "*Client consultation*". While the remaining factors were belonged to tactical category: "*Project mission*", "*Personnel*", "*Technology to support the project*", "*Client acceptance*", "*Monitoring and feedback*", "*Channels of communication*" and "*Troubleshooting expertise*". The focus of these CSFs was at the business operational level.

Bounds (1998) listed out several success factors in the execution phase: "*Staff training and education*", "*Dedicate resources*", "*Good tools*", "*Strong leadership and management*" and "*Concurrent development of the individual, team, and organization*". CSFs proposed by Clarke (1999) are "*Effective communication*", "*Clear objectives and scope*", "*Dividing the project into manageable components*" and "*Use project plans as living document*". The most recent CSFs were reported by Standish Group (2003): "*User involvement*", "*Executive management support*", "*Experienced project managers*", "*Clear business objectives*", "*Minimizing scope*", "*Agile requirements processes*", "*Standard software infrastructure*", "*A formal methodology*", "*Reliable estimates*", "*Skilled staff*", "*Effective tools*" and "*Process improvement using software development capability maturity models*".

The summary of the CSFs is given in Table 2.

References / Categories	Kerzner (1987)	Morris and Hough (1987)	Pinto and Mantel 1990; Pinto and Prescott 1990; Pinto and Slevin 1989	Bounds (1998)	Clarke (1999)	Standish Group (2003)
Objective		Project objectives/definitions	Project mission		Clear objectives and scope	Clear business objectives
Scheduling and Scoping			Project schedule/plan		Dividing the project into manageable components	Minimizing scope
Overall Commitment and Communication	A corporate understanding of project management Executive commitment to project management	Communication and control Politics	Top management support Client consultation Channels of communication		Effective communication	Executive management support User involvement
Monitoring and Control	A commitment to planning and control		Monitoring and feedback		Use project plans as living document	A formal methodology
Contingency	Organizational adaptability	Schedule duration urgency	Troubleshooting expertise			
Technical Issues		Technical uncertainty	Technology to support the project	Good tools		Effective tools Standard software infrastructure
HR related	Project manager selection criteria Project management leadership style	Human quality	Personnel	Strong leadership and management Staff training and education		Skilled staff Experienced project managers
Others		Financial contract legal problems Resources management	Client acceptance	Dedicate resources Concurrent development of the individual, team, and organization		Agile requirements processes Process improvement using software development capability maturity models Reliable estimates

Table 2: Summary of Critical Success Factors from the literatures

Up to 1990s, many CSFs were developed. It was difficult to apply the success concepts practically with those scattered pieces, so critical success frameworks emerged from 1990s. Cleland and Ireland (2002) views project success factors from two perspectives: project performance and strategic mission. This classification is too broad and should be narrowed down. Belassi and Tukel (1996) had a more detailed grouping of CSFs into four areas: factors related to the project, factors related to the project manager & team members, factors related to the organization and factors related to the external environment. This classification could help project managers to evaluate what is/are the origin(s) of faults in case the project failed. For example, if the project lacks of functional mangers' support which is one of the factors related to the organization, project manager could quickly identify the source and seek for solutions from the organization level. Another usage of this classification is to help project managers plan the project from a top-down approach, since the groupings are narrowed down form the organizational level to individual level.

Although success factors that were identified in the project management literatures are very comprehensive, only some of them could be applied in the outsourced software development project. Those factors do not cover the vendor selection process and the project transition process. Thus, a new set of factors should be developed for outsourced development projects, so that clients and vendors can have better guidance for project success.

2.5 IT outsourcing

Business challenges are found anytime and anywhere. With the trend of globalization, high-speed innovation, shorter product life cycle, rapid changing environment and highly dependent on advanced technologies, the business environment would be more challenging then ever before. Enterprises are continually looking for effective solution that would help them focusing on their core competence and reacting faster to market changes so that they could be ahead of their competitors. IT outsourcing which helps companies gain competitive edges, is receiving more attention in recent years. IT outsourcing has experienced several evolutions since 1960. The following is a brief summary of the IT outsourcing history.

In 1960s, people outsource due to the expensive computing facilities. In 1970s, inadequate supply of IT personnel forced managers to rely on contract programming (outsourcing). The arrival of low-cost minicomputer/PCs shifted the focus to vertical integration in 1980s. At that time companies bought standardized equipment, application software and communication to form their own infrastructures, so not much outsourcing activities at that period. The idea of onsite facilities management was came up in 1990s. IT personnel were shifted from customer to the vendor, so that associated educations and trainings were responsible by vendors (Lee, Huynh and Kwok 2003). Nowadays, vendors tend to provide total solutions. This would increase complexities in the projects and difficulties in managing them. Contacts are no longer enough to provide total protection. Instead, relationships are more important. Therefore, we should not only use the traditional technical-economic perspective to view IT outsourcing. Instead, we should start to view IT outsourcing in trust and collaborative relationships perspectives (Shia, Kunnathurb and Ragu-Nathanb 2005).

Researches on IT outsourcing have been done for over a decade. Previously published works in IT outsourcing could roughly be categorized into two streams. One is using survey studies or case studies to investigate the determinants of outsourcing that is called descriptive research, while another is called prescriptive research which uses quantitative analyses and economic theory to derive managerial implications for outsourcing (Rao, Nam and Chaudhury 1996). In addition to these two streams, outsourcing studies could also be categorized into three groups according to different perspectives. They are *economic view*, *social view* and *strategic management view*.

Researches from economic view are mainly based on transaction cost theory and agency cost theory which believed that goods and services could be produced most efficiently in specialized organizations; such as outsourcing vendors that are able to achieve the economies of scale (Cheon, Grover and Teng 1995). Researchers in this group are mainly investigating what factors would increase the transaction cost/agency cost and decrease the market efficiency.

Social exchange theory and power-political theory are the major theories to analyze the relationships between clients and vendors. Studies in social view would consider trust, social capital and collaborative relationships other than cost considerations (Lacity and Hirschheim 1993).

Strategic management view focused on resource-based and resources-dependence considerations. Resources-based refers to internal resources, while resources-dependence refers to external resources. The objective of studies from strategic management view is to gain competitive edges from acquiring/allocating internal and external resources strategically. Besides, aligning outsourcing decisions with firms' strategies/goals is also the focus (Applegate, McFarlan and Austin 2007; Cheon et al 1995).

Each view has its shortcomings. For example, strategic management view neglected the relationship management between firms and their external environments; economic view does not consider other factors that would also affecting the outsourcing decisions, such as environment, strategy and prior vendor relationships. It is difficult to have an integrated view that inclusively provides an in-depth analysis of the IS outsourcing activities. Some scholars tried to integrate those perspectives to form a list of determinants that would result in successful outsourcing. Those determinants are also called success factors.

2.6 Success Factors for Outsourced Project

The primary initiative of proposing success factors is that the majority of outsourcing projects does not achieve desirable results; such as cost saving, IS services quality improvement, flexibility and focus on core competencies (Slaughter and Ang 1996). Previous case study of 14 U.S. companies, which had IS outsourcing activities, found that initially proclaimed benefits were not realized (Lacity et al. 1993). There raised a need of constructing determinants of success (Saunder, Gebelt and Hu 1997).

Related literatures could be categorized into two types/stages. The first stage is exploring. Interviews are conducted and tape recorded. Success factors are then derived from the transcripts by content analyses. At the second stage, those identified factors would be grouped and tested systematically by quantitative methods.

Unlike project management, success factors identified in the outsourcing literatures are from higher level perspective. Examples are vendor capability, solidarity, flexibility, vendor monitoring, relationship exploitation, stakeholder management, control process …etc (Gottschalk and Hans 2005; Jennex and Adelakun 2003; Kim and Chung 2003; Lacity et al 1993; Oza, Hall, Rainer and Grey 2004; Rajkumar and Mani 2001; Soliman, Chen and Frolick 2003).

This stream of study does not have a long history, so the factors identified are not many as that in the project management literatures. Another observation is that, success factors in outsourcing literatures are tend to be developed from theories. On the country, most of the factors found in the project management literatures are based on best practices form the industry.

With reference to CSFs from project management literatures and outsourcing literatures, a new set of success factors/ tactics have been developed and shown in Table 3.

Table 3 Success Factors/Tactics with justifications

	IS Project Management Tactics	Justifications	Sources of ideas
1	All participants have a clear understanding on the project objectives and scope.	With clear project objectives, both client and vendor would not confuse with what they are trying to achieve. A well-defined scope is the track which let all participants remain within the boundaries, so that scope creep could be avoided and all vital parts of the project would not be left out. If all participants have a clear understanding on the project objectives and scope, they would bear in mind of the ultimate goals and follow the right track to achieve it.	(Clarke 1999) (Pinto and Prescott 1988) (Pinto and Slevin 1989) (Pinto and Prescott 1990)
2	Goal commitment of project team.	Having understanding on the goal is not enough. Goal commitment from project team member is vital. Without gaining commitment from the project team members, the project plan could not be executed. Through the endorsement process, all team members have a chance to understand the project plan, their role in its execution and their responsibilities. It enhances the likelihood of project success.	(Baker, Murphy et al. 1983) (Pinto and Prescott 1988) (Pinto and Slevin 1989) (Pinto and Prescott 1990)
3	Communicating, consulting and listening to all impacted parties.	The need for consultation has been found to be increasingly important in attempting to successfully implement a project, since adequate communications enrich mutual understanding among all involved parties and sufficient consultations enhance the accuracy of user requirements that would result in higher probability that users would accept the developed system.	(Pinto and Prescott 1988) (Pinto and Slevin 1989) (Pinto and Prescott 1990) (Standish Group 1994)
4	Selection of capable and experienced vendor.	Vendor selection is an important process in an outsourcing project. Vendor is a business partner. Their strengths would assist in project success, while their vulnerabilities would have a bearing on the success. Key attributes, like domain knowledge and related experiences, should be evaluated during the selection process. If the vendor has related domain knowledge and experiences, there is less likelihood of misunderstanding the user requirements.	(Power, Desouza et al. 2006)

5	Every party's roles and responsibilities are clearly defined	Every party's roles and responsibilities should be clearly defined otherwise resources mismatch would be occurred. Tasks may be done by improper persons or some tasks may become orphans. This would mess up the schedule and consequently result in project delay. Roles and responsibilities should not only be identified as being conducted by the vendor or client, but also be specified who does what and when. This would make each organization accountable.	(Power, Desouza et al. 2006)
6	A proper and realistic project plan.	If project plan is unrealistic, team members may be pushed too harsh to catch up the unreasonably rush schedule or the schedule is too loose that team member ignoring it. An unrealistic project plan may not only have great impacts on the project schedule, but also affect the budgets.	(Standish Group 1994)
7	Accurate estimations of costs in the planning stage.	In the evaluation of the project, initial cost estimation serves as the baseline to check whether the budget has overrun or not. The quality of the initial estimation would affect the project evaluation result.	(Baker, Murphy et al. 1983) (Standish Group 1994)
8	Accurate estimations of man-hours in the planning stage.	If man-hours are not accurately estimated, resources shortage or wastage would occur. Both project schedule and budget would be affected.	(Baker, Murphy et al. 1983) (Standish Group 1994) (Sayles and Chandler 1993)
9	Resources are not shared among multiple simultaneously executing projects.	Usually, several projects would be concurrently executed by a vendor. Resources may be shared among different projects. If resources are not properly allocated, there is higher potential that resources scarcity would come about. Project would be delayed and the quality of the project outcome would be lowered.	(Bounds 1998)
10	Manageable project milestones.	Milestone is a scheduling event that expresses the completion of a major stage or a set of related deliverables. It servers as a check point. If problems are identified in one stage, corrective measures would be taken to prevent the effects spreading to the next stage or even the entire project. If milestones are set too far away, situations become more complicated. Problems could not be easily uncovered and corrective measures turn into clumsy, since more parties and activities involved in each stage. Project without manageable milestones would place burdens on the managing works.	(Standish Group 1994) (Clarke 1999)

11	Using project management tool to help in planning, scheduling and decision making.	Computer software simplifies computational works and makes our life easier. Project management involved chunks of computational works; for instance, calculating budgets, estimating man-hours, allocating resources, scheduling…etc. Without project management tools, like Microsoft Project, Project Scheduler (by Scitor Corp), and CA-SuperProject (Computer Associates), huge efforts have to be put into the calculations. Focuses are shifted from analyses to calculations. Project manager may lose sight of the big picture. Also, it would take longer time to make decisions and result in slow responses to uncertainties.	(Bounds 1998)
12	Clear statement of user requirements without ambiguous meanings and understood by all team members.	Before the project start, there should have a statement specifying what the users' needs are. However, clients and vendors may have different level of understandings on the same statement, if it is not clearly written with ambiguous meanings. If the user requirements are full of technical terms, clients may not have enough technical knowledge to understand the details. Or, if the statement only lists out names of the required functions without specifying what and how the functions would actually perform, the deliverables may not be what they have expected. These expectation discrepancies may spoil the project and the client-vendor relationship.	(Standish Group 1994)
13	Service Level Agreements (SLAs) contain measurable targets.	Every term in the Services Level Agreements (SLAs) should be defined clearly and could be measured objectively otherwise it is difficult to be evaluated and becomes useless. SLAs are frames for evaluations. Having a clear definition of each measurable term up front prevents arguments later on in the evaluation of the outsourcing project that would dissatisfy the clients.	(Power, Desouza et al. 2006)
14	Client's expectations on severe and critical issues are documented in detail; e.g. disaster recovery and security practices.	During the development or implementation of the project, things may go wrong. Contingency plan should be there to due with uncertainties. Reporting mechanisms should be established between clients and vendors. If critical issues broke out, who should be contacted; how long should the response time be; what happens when there is no predefined person responsible for the issue? The troubleshooting procedures should be documented with considerations of client's expectations, so that coherences exist between client's and vendor's contingency plans. The cohesiveness of the contingency plans could avoid chaotic situations when critical issues arise.	(Power, Desouza et al. 2006)

15	Ensuring actions performed are adhered to specifications through monitoring and controls.	Monitoring on project schedule, budget, quality of deliverables and project team members' performances should be preformed regularly. Current status should be compared to initial projections. Without regular monitoring, the project manager and/or clients lack of adequate information to execute control measurements. Problems cannot be anticipated and deficiencies would be overlooked. This would impair the likelihood of project success.	(Pinto and Prescott 1988) (Pinto and Slevin 1989) (Pinto and Prescott 1990)
16	Monitoring the contract to ensure vendor adhere to specified terms.	Besides to specifications, vendors should adhere to the terms that have been specified in the contract. Client should regularly monitor the vendors in order to make sure that they stay with the contract. This regular review should not go into details and should focus on the big picture, so that achievements of the overall objectives could be ensured.	(KPMG IMPACT Programme and Outsourcing Working Group 1995)
17	End-users are involved in monitoring service delivery against targets.	User requirements may not specific enough to include all the details of users' needs. End-users could easily find out the mismatch between the agreement and their requirements. Problems could be unfolded at a relatively early stage. Through monitoring, users may get a brief idea of how the systems would look like before the actual implementation. They can express their opinions on the issues that have not been included in the requirements, like interface designs. It would enhance the user acceptance, if end-users are involved in the monitoring process.	(KPMG IMPACT Programme and Outsourcing Working Group 1995)
18	End-user Training to increase the acceptability of the implemented system.	User acceptance is a stage that should be properly managed. Why users refuse to adopt the system? One possible reason is that end-users are not familiar with the new system. Users cannot see how much their productivities be increased through the use of the system. On the contrary, users may find that the new system places burdens on their daily jobs, since they have to explore the functions and spend time on the user menu. In order to improve the likelihood of the user acceptance, adequate end-user trainings should be provided. A project could not be claimed as success, if end-users do not accept its deliverables.	(Pinto and Prescott 1988) (Pinto and Slevin 1989) (Pinto and Prescott 1990)

19	Regularly review the outsourcing contract to enhance flexibilities (especially when new technologies emerge).	With floods of information, the world becomes too turbulent and unpredictable. New technology emerges faster than what we have expected. More options may be available after two or three years. As time goes by, clients learn more or the circumstances changed. Objectives and requirements may refine accordingly. If an outsourcing project takes years to complete, its contract should be reviewed regularly to enhance the flexibility. Without flexibility, the project may deliver obsolete system.	(KPMG IMPACT Programme and Outsourcing Working Group 1995) (Lacity et al. HBR May 1995)
20	Ensuring enough competent internal staff to manage the outsourced situation.	Staff with relevant technology knowledge/skills should be retained in the client organization otherwise it would be difficult for the client to manage the contract and the vendor. Without adequate competent staff with relevant skills, the vendor may be able to manipulate the client. The client may loss the controls and become more rely on the vendor. Without proper monitoring, things may easily go wrong that would incur project failure.	(KPMG IMPACT Programme and Outsourcing Working Group 1995)
21	Project team possesses troubleshooting ability to handle unexpected crisis.	When crisis arise, project team should have the ability to settle down the issues as early as possible otherwise the unsettled problem may give rise to some bigger problems. Having quick responses to unexpected crisis increases possibility of project success.	(Kerzner 1987) (Pinto and Prescott 1988) (Pinto and Slevin 1989) (Pinto and Prescott 1990)
22	Effective communication throughout the project.	Effective communication can avoid duplication, help reduce errors, manage uncertainties, obtain more accurate user requirements and reach consensus. Previous researches found that lack of communication is the major cause of project failure.	(Clarke 1999) (Pinto and Prescott 1988) (Pinto and Slevin 1989) (Pinto and Prescott 1990) (Kerzner 1987)
23	Each participant (development team members, users, vendor(s)…etc) is having trust in the other.	Without trust, the client and vendor are unlikely to share information/knowledge with each others, as a result, necessary information are missing. The project may take longer time to complete.	(Kerzner 1987) (KPMG IMPACT Programme and Outsourcing Working Group 1995)

24	Simplified administrative works for team members.	Administrative works should be simplified so that project team members could focus on their value-added works. The structure becomes more complicated in an outsourced project, since both client and vendor are involved. Jointly managed projects may result in bureaucratic structures, decision delays, red tape that would relatively diminished success.	(Baker, Murphy et al. 1983) (KPMG IMPACT Programme and Outsourcing Working Group 1995)
25	Keeping harmonic relationship with vendor(s).	No contract could include all the details and detailed monitoring of vendor's work is costly. It is a good idea to develop trust with vendors. As trust develops over time, the client can reduce resources on monitoring vendor's performance, disclose more information to the vendor and involve the vendor in internal discussions and planning. These would increase the probability of project success.	(KPMG IMPACT Programme and Outsourcing Working Group 1995)
26	Top Management Support.	Top management support could be understood as getting authorities, directions, and supports from the top management. It also involved allocation of sufficient resources (both financial and manpower) and trust in the project manager. With these supports, the project would more likely to be success.	(Pinto and Prescott 1988) (Pinto and Slevin 1989) (Pinto and Prescott 1990) (Standish Group 1994)

3. SIGNIFICANCE

The aim of our study is to develop a set of *life-cycle centric* tactics for managing outsourced software development projects that could be served as guidance for both clients and vendors.

From the literatures, nearly all success factors were developed based on practitioners' perceptions or derived from different theories. Factors derived in these ways may not actually reflect the real situations.

In our study, we found success factors from project management literatures and outsourcing literatures. Since some success factors are too vague, we have to rewrite them into actions that could be performed, called tactics. In this study, tactics are equivalent to success factors that can be put into practice. Then we identify success factors by asking practitioners what tactics they have applied in the projects that they have participated in. After that, we study the correlations between the tactics applied and the success criteria. Tactics that are significant to certain success criteria could be found. Those applied tactics contributed to project success are also called success factors.

Our theoretical contribution is that we use respondents' reported actions instead of asking for practitioners' perceptions to determine success factors. The research findings would reflect better understanding on the real situations.

Besides, success factors that we could found were developed separately in project management literatures and outsourcing literatures. Both of them cannot comprehensively account for the outsourced software development projects. There is a need to develop a set of success factors that could be applied in the management of outsourcing software development.

In general, success factors for IT outsourcing are developed from macro viewpoint. There is a lack of some micro viewpoint factors such as scheduling and configuration management. Meanwhile, success factors for project management often missed out factors from macro viewpoint. One major theoretical contribution of this study is to align the two perspectives and develop a new set of complementary success factors for clients and vendors to follow and achieve success in managing outsourced development projects.

Moreover, success factors from outsourcing literatures are scattered around and do not have many proper groupings or classifications. In our study, we would group success factors in line with the development life-cycle, so that a set of life-cycle centric success factors would be developed. In this way, the usability of success factors would be enhanced. This contributes both to the theory and practice.

4. METHODOLOGY

With project management literatures and outsourcing literatures support, a preliminary set of tactics for outsourcing project success and the first draft of the questionnaire was developed.

In order to increase the comprehensiveness of the list, questionnaires were sent to academics, who had experiences in managing software development projects, for review attempting to understand the reality from project management experts' points of view. By doing so, more tactics had been unfolded. Tactics and the questionnaire design had been modified based on experts' opinions. We have already finalized the questionnaire.

Our target respondents are IT managers/CIOs/Project Mangers/software engineering professionals of companies which have IT outsourcing project/in-house software development project in the past or at present. The questionnaires included demographic items (such as job title, age, gender, experiences in project management, project team size, industry……etc.) as background information which are necessary for validating whether biases existed or not.

Members (excluding student members) of the Project Management Institute – Hong Kong Chapter (PMI-HK) would be invited to participate in our survey, since PMI is a well known organization which gathered project management professionals worldwide. Invitation letters would be sent out one week before the distribution of questionnaires. In order to increase the response rate, reminders would be sent after two weeks of the questionnaires distribution.

List of tactics would be given to respondents who would give rating to each tactic on a 5-point scale where 1 represents the highest degree of importance and 5 represents the one with lowest weight. Their responses should base on their own opinions and perceptions.

After asking for their perceptions on the tactics, we also want to study how often they have put the listed tactics into practices according to their experiences. 5-point likert-type scale would be used for indicating the occurrence of the tactics where "a" indicates the tactic had always been applied, whereas "e" designates that the tactic had never been applied.

Spaces would be provided for respondents to express their opinions on the tactics. They can suggest adding more tactics or deleting the existing one.

In the analysis, average scores would be calculated for each tactic. The one with lowest averaged score would be the most important tactic. A new set of success tactics with relative importance would be developed. Besides, relations would be found between the tactics and the success criteria.

Also, we would explore is there any discrepancy in respondents' perceptions and their reported practices. Follow up interviews would be conducted whenever necessary.

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