THE ROLE OF RISK MANAGEMENT PRACTICES IN THE SUCCESS OF

SOFTWARE OUTSOURCING FROM THE PERSPECTIVE OF A CLIENT FIRM

By

JAMES SUNDARARAJ A/L MIGEEMANATHAN

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ABSTRAK

Peranan amalan pengurusan risiko dari sudut pandangan firma pelangan terhadap kejayaan projek perisian yang dilaksanakan secara pembangunan tempah daripada pihak ke tiga.

Fenomena pembangunan tempah daripada pihak ke tiga dalam bidang Teknologi Maklumat (TM) sedang mengalami tahap kematangan sejak beberapa tahun kebelakangan ini. Banyak organisasi telah mempertimbangkan untuk melakukan pembangunan tempah daripada pembekal pihak ke tiga bagi memenuhi keperluan fungsi TM seperti aktiviti pembangunan perisian. Walau bagaimanapun kejayaan aktiviti pembangunan tempah tidak dapat dijamin. Ia memerlukan suatu tahap amalan pengurusan risiko dilaksanakan untuk memantau dan mengawal risiko yang berkaitan dengan aktiviti-aktiviti pembangunan tempah. Kajian ini dilaksanakan untuk mengetahui peranan amalan pengurusan risiko dalam menentukan kejayaan aktiviti pembangunan tempah. Borang soal selidik berstuktur digunakan dalam kajian ini. Ia diedarkan kepada 200 pekerja di firma pelanggan. Data yang dikumpulkan telah diuji melalui kaedah statistik. Keputusan kajian menunjukkan bahawa hubungan diantara persekitaran untuk projek pembangunan tempah dan kejayaan projek pembangunan perisian dengan kaedah pembangunan tempah menjadi lebih kukuh apabila amalan pengurusan risiko adalah tinggi.

ABSTRACT

The Information Technology (IT) outsourcing phenomenon had been maturing in recent years. Many organizations considered to outsource their IT functions such as software development activities to a third party vendor. However the success of such outsourcing decisions will not be guaranteed. It required some level of risk management practices to be in place to monitor and control the risk associated with outsourcing activities. This study was conducted to find out the role of risk management practices in ensuring the success of the outsourcing activities. Structured questionnaire was used in this study. It was distributed to 200 employees of the client firms. The data collected was statistically analyzed. The results showed that the relationship between nature of software outsourcing and the success of the software outsourcing project become stronger when the risk management practices is high.

Chapter 1   INTRODUCTION

1.1   Background

Software outsourcing had been a common phenomenon in Information Technology (IT) industry. In typical software outsourcing projects, the firm that is requesting the service is called as client firm. Meanwhile the firm which provides the service is referred to as vendor firm. The client firm outsourced their software development function to a third party vendor to achieve cost efficiency and remain competitive in current business environment. Some of the benefits the firms try to achieve by outsourcing are reduction in operation cost, system quality improvement, allowing the firm to focus on its core competencies, explore new technologies and focus on value added activities. (Oh, Gallivan & Kim, 2006). However regardless of the various benefits of software outsourcing, the firm always faces the risk associated to the outsourcing activities.

The risk of the software outsourcing projects is related to certain behaviors of the vendor firm. Some examples of such behaviors are shirking, poaching and opportunistic renegotiation (Aron, Clemons & Reddi, 2005). The undesired behavior of the vendor firm will lead to failure of the software outsourcing projects. Analysis had been done to identify the reasons for such failures. The researchers found that the activities that had been outsourced may fall into the core competency of the firm. If such activities were outsourced, then the firm may lose its control to the vendor. The vendor may take the opportunity to gain control over the client

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firm. The outsource contract may end up in lock in situation (Oh, Gallivan & Kim, 2006). In order to avoid such undesired situation, the outsourcing activities and its associated risk must be managed properly by the client firm. A well defined risk management practices must be in place to monitor and mitigate the risk.

1.2   Problem Statement

Many firms consider software outsourcing as a strategic move for the firm to remain competitive in the industry. This had been a driving force for the firm to take impulsive decision to engage in the outsourcing activities. Even though many outsourcing decision achieved the intended results, but there are some cases that software outsourcing projects are not successful. An example of successful outsourcing projects are referring to the case of British Petroleum (BP) outsourcing its IT functions (Aubert, Patry, Rivard, & Smith, 2000). In Malaysian context, global firms such as Nokia and Hewlett Packard had been successfully outsourced their call center operation to Malaysian own company Scicom (Frost & Sullivan, 2005). Meanwhile the case of failure was shown by the outsourcing projects performed by banking industry in Malaysia. The bank which carried out the outsourcing projects faced resistance to change from employees and also decline in service quality for the outsourced services (Suhaimi, Mustaffa, & Hussin, 2005).

These outcomes raised a question why some software outsourcing projects are successful meanwhile some are not successful. The software outsourcing projects are not successful because there are risks associated to the project. Further analysis into why risk existed in

software outsourcing projects lead the researchers to look into the nature of the software outsourcing project. The nature of the software outsourcing projects can be further categorized into vendor competency, degree of outsourcing, contract duration and relationship. Each elements of the nature of software outsourcing contributes to success or failure of the projects. Further analysis on each elements of the nature of software outsourcing projects will be described in Chapter 2.

Meanwhile some of the software outsourcing projects was successful because the firm engaged in outsourcing activities performs risk management practices. The risk management practices were able to mitigate the risk associated to the nature of software outsourcing projects.

Thus, the problem is to **find out empirically if the risk management practices play moderating role in the relationship between nature of software outsourcing and the success of the software outsourcing project.** The finding will help the client firm to strategize their software outsourcing projects. The firm need to analyze the type of task intended to be outsourced and the risk related to it before the decision for outsourcing is made. Aubert, Rivard and Patry (1996) (as cited in Aubert, Patry & Rivard, 2005) suggested that not all type of task is suitable for outsourcing. Some types of task should be kept in house rather than outsourced to a third party vendor. The task suitable for outsourcing should have lower risk compared to the one performed in house.

However, in current situation the client firm need to engage a vendor firm to support more critical IT functions such as software application development. In this case the risk of failure

is higher but if the software outsourcing projects can be completed successfully, the client firm is able to achieve higher return in terms of cost saving and strategic capability. The risk management practices are perceived to be helpful to mitigate the risk and increase the chances for the software outsourcing projects to be more successful. These are the motivation that drives the study to find out the role of risk management practices in the relationship between nature of the software outsourcing and the success of the project.

1.3   Research Objective

The objective of this study is to investigate empirically the role of risk management practices as a moderator in the relationship between nature of software outsourcing projects and the success of the projects.

1.4   Research Questions

The decision to outsource a software project to a third party vendor firm is associated with a number of risks. The risk exposure level is depending on the nature of the software outsourcing project (vendor competency, degree of outsourcing, contract duration and relationship). When the vendor has higher competency level then the risk of failure is lower. For degree of outsourcing, when more complex activities have been outsourced, then the risk of failure is higher. When the contract duration is longer, there is possibility that the vendor behaves opportunistically and possesses higher risk of failure. Finally when the client firm and the vendor firm have good relationship, then the risk of failure is lower. Barki, Patry and

Rivard (2001) posit that the high risk outsourcing projects need close monitoring whereas the low risk outsourcing projects does not need much control. So the success of the outsourcing project will be depending on the ability of the client to manage the risk which is associated to the nature of the outsourcing project. This study will try to answer the research question as stated below.

Do the risk management practices moderate the relationship between the nature of the outsourcing project and the success of the project?

1.5   Definition of Key Terms

For the purpose of this study the following definition will be used when specific terms were referred.

1.5.1   Risk

Risk in the context of software outsourcing can be defined as possibility of loss or failure to achieve the desired outcome (Boehm, 1991) as agreed upon by the contract between the client and vendor. Aubert, Patry and Rivard (2005) in their research, defined the risk as a function of the probability of a negative outcome and the importance of the loss due to the occurrence of this undesirable outcome. Some of the undesirable outcomes are unexpected transition and management cost, switching cost, costly contractual amendments, disputes and litigation, service debasement, cost escalation, loss of organizational competency and hidden service

cost. Aron, Clemons and Reddi (2005) classified risk into four categories which are strategic risk, operational risk, long term risk of atrophy, and intrinsic risk of location.

1.5.2 Risk Management Practices

Risk management are referring to activities that includes identification and analysis of the risk to a software outsourcing project and then implementation and monitoring measures which is aimed to reduce the risk (Padayachee, 2002). Aubert, Patry and Rivard (2005) mentioned that risk management is referring to the use of special procedures to reduce the level of risk exposure.

1.5.3 Software Outsourcing

Software development is referring to the activities that are done during the software development life cycle which includes designing, coding, testing and maintenance of the software component. Software outsourcing represents the software development activities which are done by a third party vendor to fulfill the requirements from a client firm. Corbett et al. (2002) (as cited in Fairchild 2004) suggested that outsourcing concept are referring to contractual relationship between the client firm and the outside service provider for a task that is normally done in house.

1.5.4 Client Firm

In the context of software outsourcing, the firm that is requesting software development services is referred to as client firm, whereas the firm providing the services is called vendor firm. The client firm will be engaged in a contract terms with the vendor firm who provide the required services or product.

1.5.5 Nature of Software Outsourcing

The nature of outsourcing is referring to the characteristics and environment of the elements related to the software outsourcing projects. The elements considered for this study are as below:

Vendor Competency - technical skills, process capability and vendor experience in executing the software outsourcing projects (Aubert et al., 1999).

Degree of Outsourcing – level of Information System being outsourced (Dibbern et al., 2004).

Contract Duration – the length of outsourcing contract given to a vendor (Lacity & Willcocks, 1998).

Relationship –strategic partnership or buyer seller relationship between the vendor and client (Marcolin & McLellan, 1998).

1.5.6   Software Outsourcing Success

The software outsourcing success is defined as satisfaction with benefits of outsourcing achieved by the client firm due to the result of deploying an outsourcing strategy (Grover, Cheon, & Teng, 1996).

1.6   Significance of the Study

The study is vital for the client firm to understand the importance of selecting the appropriate type of activities that can be outsourced. If the firm chooses high risk activities to be outsourced then it should follow up closely with the risk mitigation plan. If the risk management is not done properly then the firm may face the risk of not completing the outsourced task successfully. It may jeopardize the actual goal the firm trying to achieve via outsourcing arrangement. The cost and time line of the outsourced activities will be badly effected. So it is crucial for the client firm to decide on the type of activities that can be outsourced and perform risk management practices that is effective in mitigating and eliminating the risk (Barki, Rivard & Talbot, 2001).

Besides that, the analysis of this study had been done at the micro level by looking at the managerial staff's perception on the role of the risk management practices. According to Dibbern, Goles, Hirschheim and Jayatilaka (2004), the domain of Information System (IS) outsourcing is maturing. Many researches are focusing at the macro level (firm and customer perspective) however there are very few researches focusing at micro level (individual or

group perspective). The researchers believe that expending the view up or down the scale would bring fresh insights to the body of knowledge in IS outsourcing field.

1.7 Organization of Remaining Chapters

The theoretical foundation for the study will be presented in chapter two. This chapter lay out the literature review on software outsourcing and the risk management practices. The discussion on this chapter will be covering the independent variables: outsourcing vendor competency, the degree of outsourcing projects, outsourcing contract duration and the client-vendor relationship. The dependent variable would be outsourcing project success. The risk management practices would be the moderating variable between the independent variable and the dependent variable. The research hypotheses will be introduced at the end of the chapter.

Chapter three discussed the research methodology of the study. A survey questionnaire method was used to gather data regarding the independent, dependent and the moderating variables. Statistical techniques used in this study were briefly elaborated at the end of the chapter. Meanwhile chapter four focused on the results of the study. The demographic profile and outcome of the statistical analysis were presented in this chapter. Finally the discussion and conclusion of the study were shown in chapter five.

2.1   Introduction

This section describes the review of prior literatures on the topics of software outsourcing and risk management. The theories supporting the risks behavior and strategies for the organization to mitigate the risks related to software outsourcing had been identified. The research hypotheses on the relationship between the variables were also established.

2.2   Information System (IS) Outsourcing Phenomenon

The Information Technology (IT) industry had been triggered by the Eastman Kodak's move to outsource its IS function to IBM in 1989. This is the first time such a major corporation had announce to outsource the IS department which was previously considered as a strategic asset (Dibbern, Goles, Hirschheim & Jayatilaka, 2004; Lee, Huynh, Kwok & Pi, 2003). Goo, Kishore, and Rao (2000) mentioned that since then the IS outsourcing phenomenon had evolved from traditional outsourcing services (data center, telecommunication infrastructure and desktop outsourcing) to a more specialized services such as Application Service Provider (ASP), business process outsourcing (BPO) and e-business hosting.

2.3 Types of Outsourcing Risk

Aron, Clemons and Reddi (2005) suggested that the risk caused by outsourcing activity can be subdivided into few components of risk. There are strategic risks, operational risks, intrinsic risks of atrophy, intrinsic risks of location and transactional risk. The strategic risk is caused by the deliberate actions that the supplier may take as part of a profit-maximizing strategy. Examples of strategic risk are shirking, poaching or the misuse of information originally provided for a legitimate contract and opportunistic renegotiation. The researchers further define the operational risk as the risk of suboptimal output that caused by complexity of operations, geographic separation and the limitations of the communications channel between them. The intrinsic risks of atrophy happen when the client firm outsourced the entire activities to supplier. The firm may lose its core expertise that is capable of executing the activity in house. Finally the researchers explained that the intrinsic risks of location are caused by moving activities to remote locations. These risks are associated with different regions having its different sociopolitical systems and historical background.

To gain an insight of the risk from the vendor's perspective, Taylor (2005) suggested that the risk to the vendor may arise from commercial environment, client, vendor firm itself, nature of software product, location and process.

Risk is defined as the function of probability of undesired outcomes and the loss associated due to the undesired outcome (Boehm, 1991; Teece et al., 1994) (as cited in Aubert, Patry and Rivard 2005). Aubert et al. (2000) had done an extensive study on the possible undesirable outcomes that may happen in an outsourcing arrangement between the client and the vendor.

The researchers also had also identified the factors that are associated to the outcomes. The details of their findings are summarized in Table 2.1. The findings can help us to understand the reason behind the undesirable outcomes and take appropriate action to mitigate the risk.

Table 2.1

Components of IT outsourcing risk exposure

Undesirable outcomes	Factors leading to the outcome
Unexpected transition and management costs (Cross, 1995; Earl, 1996; Nelson et al., 1996)	- Lack of experience and expertise of the client with the activity (Earl, 1996; Lacity et al., 1995, Sappington, 1991) - Lack of experience of the client with outsourcing (Earl, 1996) - Uncertainty about the legal environment
Switching costs (including lock-in, repatriation, and transfer to another supplier) (O'Leary, 1990)	- Asset specificity (Williamson, 1985) - Small number of suppliers (Nam et al., 1996) - Scope - Interdependence of activities (Langlois & Robertson, 1992)
Costly contractual amendments (Earl, 1996)	- Uncertainty (Alchian & Demsetz, 1972; Barzel, 1982) - Technological discontinuity (Lacity et al., 1995) - Task complexity
Disputes and litigation (Aubert et al., 1999a; Lacity & Hirschheim, 1993)	- Measurement problems (Alchian & Demsetz, 1972; Barzel, 1982) - Lack of experience and expertise of the client and/or of the supplier with outsourcing contracts (Earl, 1996; Lacity et al., 1995) - Uncertainty about the legal environment - Poor cultural fit
Service debasement (Lacity & Hirschheim, 1993)	- Interdependence of activities (Aubert et al., 1997; Langlois & Robertson, 1992) - Lack of experience and expertise of the supplier with the activity (Earl, 1996) - Supplier size (Earl, 1996) - Supplier financial instability (Earl, 1996) - Measurement problems (Alchian & Demsetz, 1972; Barzel, 1982) - Task complexity

Cost escalation (Lacity and Hirschheim, 1993; Lacity et al., 1995)	- Lack of experience and expertise of the client with contract Management (Earl, 1996; Lacity et al., 1995) - Measurement problems (Alchian & Demsetz, 1972; Barzel, 1982) - Lack of experience and expertise of the supplier with the activity (Earl, 1996)
Loss of organizational competency (Dorn, 1989; Earl, 1996; Lacity et al., 1995)	- Scope of the activities - Proximity to the core competency (Prahalad & Hamel, 1990) - Interdependence of activities (Langlois & Robertson, 1992)
Hidden service costs (Lacity & Hirschheim, 1993)	- Complexity of the activities - Measurement problems (Alchian & Demsetz, 1972) - Uncertainty (Barzel, 1982)

Source: adapted from Table 1 – Aubert et al. (2000) p. 3.

2.4   Information System Risk Management

Smith, McKeen and Staples (2001) found that the risk management will be helpful to the managers because it can pre-alert them on possible negative outcome prior to the actual event occurrence. The benefits of risk management are reducing additional effort spent correcting problems that could have been avoided earlier, helps to predict success and failure which occur without warning, and reduce the risk of decisions made without complete information or adequate knowledge of future consequences. The risk management process involves three steps: identification, assessment, and dealing with the risk. The researchers further conclude that risk management is considered as value added activity that turns the potential problems, opportunities, uncertainties, and hidden threats into risk mitigation actions plans which is transparent to management. It is a formal process where the risk can be brought to manageable level.

Aubert, Patry and Rivard (2005) suggested that the first step to evaluate the risk exposure for a given outsourcing contract should identify the array of potential undesirable outcomes that could occur with respect to the outsourcing arrangement. Then the magnitude of the losses and probability of occurrence are to be determined. Under normal circumstances, a few undesirable outcomes may occur. The magnitude of loss due to a given undesirable outcome can be approximated either via quantitative analysis or via qualitative assessment of the organizational impact of each negative outcome.

During the make or buy decision stage, the client need to analyze the type of task that is potential for outsourcing. If the task is critical application or strategic tool which will severely effect the operation of the firm, then it would consider to retain such application to itself and only outsource the application that is of lower risk to an outsource vendor. Wang, Lu and Zhang (2006) suggested that the selection of the vendor firm is very critical to manage the risk associated by the outsourcing contract. They propose a selection criteria based on the principle of vendor evaluation index system. This system will use five indices for evaluating vendor ability in terms of technology and production ability, management and business ability, reputation, financial operation ability, enterprise environment and understanding of pertinent laws and regulations.

2.5   Underlying Theories

The following section will explain the underlying theories related to IS outsourcing. Dibbern, Goles, Hirschheim and Jayatilaka (2004) conducted an extensive research on the literatures

regarding IS outsourcing. Their work on the underlying theories is summarized in Table 2.2. It provides a good foundation and wide coverage on the theories that can be applied to the topic of IS outsourcing. In the next section only a few important theories will be further discussed.

Table 2.2

Underlying theories on IS Outsourcing

Theoretical Foundation	Level of Analysis	Basic assumptions	Main Variables/ Focus	Key Authors
Agency Theory	Organizational	Asymmetry of information, differences in perceptions of risk, uncertainty	Agent costs, optimal contractual relationships	Jensen and Meckling (1976)
Game theory	Organizational, individual	Every player under the same conditions, make rational and intelligent decisions to maximize profit, incomplete information	Decisions under certain situations	Kreps et al. (1982); Nash (1953); Spence (1976); Fudenberg & Tirole (1990)
Innovation theories	Individual, organizational	Innovation occurs in stages, some models not based on stages	Adoption, and diffusion	Daft (1978); Rogers (1983); Schroeder et al. (1989); Zaltman et al. (1973)
Power and Politics theories	Individual, organizational	Power, idiosyncratic interests, and politics play major roles in organizational decision-making	Different degrees of power, organizational politics	Pfeffer, (1981; 1982); Markus (1983)
Relationship theories	Organizational	Parties in the relationship assume that the outcome of a relationship is greater than achieved by individual parties separately	Cooperation, interactions, social and economic exchanges	Klepper (1995); Kern (1997)
Resource theories	Organizational	A firm is a collection of resources, and resources are central to a firm's strategy	Internal resources, resources in the task environment	Barney (1991); Penrose (1959); Pfeffer & Salancik, (1978); Thompson, (1967)
Social Exchange theory	Individual, organizational	Participation in exchange occurs with the assumption of rewards and obligation to return rewards	Exchange of activities, benefits/costs, reciprocity, balance, cohesion, and power in exchanges	Blau (1964); Emerson (1972); Homans (1961)
Strategic Management theories	Organizational	Firms have long-term goals, and they plan and allocate resources to achieve these goals	Strategic advantage, strategies, choice of individuals	Chandler, (1962); Miles & Snow (1978); Porter (1985); Quinn, (1980)
Transaction Cost theory	Transaction	Limited rationality, opportunism	Transaction costs, production costs	Coase (1937); Williamson (1975; 1981; 1985)

Source: adapted from Table 3 – Dibbern et. al. (2004) p.18.

2.5.1 Agency Theory

The agency theory assumes an uncertain venture owned by a principal (client firm) and performed by an agent (vendor firm) whose actions are not fully observable to the principal. Lichtenstein (2004), in his research found out that outsourcing of software development environment fits this description well, as uncertainty is significant and performance is difficult to measure. The agency theory explained that the vendor who has unrestricted freedom due to incomplete information about their activity and invisible to the client tends to pose higher uncertainties to the client as they have less control over the vendor's activity (Keil, 2005). The researcher also posits that the vendor will show opportunistic behavior to maximize their profit instead of acting in the interest of the client. The opportunistic behavior can be classified as hidden characteristic, intention and action. Oh, Gallivan and Kim (2006) further explained that high costs is associated with the client monitoring the vendor's behavior, the vendor may be tempted to behave opportunistically due to moral hazard, adverse selection, and imperfect commitment.

2.5.2 Game Theory

The research by Oza (2006) shows that offshore outsourcing scenario matches the types of games identified in game theory. The offshore outsourcing can be classified as a nonzero-sum game if any gain achieved by client or vendor does not correspond with a loss of the other. Offshore outsourcing is also asymmetric in terms of different strategies identified for both clients and vendors. Oh, Gallivan and Kim (2006) posit that from the game theory

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perspective, many vendors are tempted to behave opportunistic by shirking or failing to perform their best work when performance is difficult for the client to monitor. Oza (2006) also shows that the element of domination in the game happens to the client during the initial stage of the outsourcing relationship. However the power will shift to the vendor after a long term outsourcing work with a particular vendor when a renegotiation of the contract is done. If the vendor has the full access to the information, then the vendor will be powerful enough to dominate the renegotiation session.

2.5.3   Resource Dependency Theory

The resource dependency theory explained that the firm exchange resources to reduce uncertainty in order to remain competitive. One of the outsourcing objectives are to secure resources and capabilities that are not available internally. This specific reason shows the resource dependency between client and vendor. When the size of the outsourcing contract increases the client becomes more dependent on the vendor, they lose control over the resources to vendor. Further more this situation will lead to high switching costs, monitoring costs, increased resource dependency, and the risk of suboptimal vendor performance (Oh, Gallivan & Kim, 2006).

2.5.4   Transactional Cost Economics

The transactional cost economics theory explained that when a client firm outsourced a function that are highly asset specific, it will be exposed to greater transactional risk than

firms who outsource commodity type function. Due to the termination value of asset specific function is very low; the vendor is less concerned about the client's potential decision to terminate the contract for nonperformance. The low termination value may therefore encourage some vendors to behave opportunistically by maximizing their own self-interest at the client's expense (example: shirking, negligence, and suboptimal performance). When proprietary resources are managed by the vendor, even if the vendor does not meet its commitments, it is difficult and costly for the client firm to substitute with another vendor (Oh, Gallivan & Kim, 2006). This will create a lock-in situation for the client where the cost of finding a substitute vendor is higher than maintaining the current vendor.

2.6 Theoretical Framework

The theoretical framework was derived base on the agency theory and the transactional cost economics theory. Based on these theories the framework for the relationship between the natures of the outsourcing project (consist of factors such as vendor competency, degree of the outsourcing project, contract duration and relationship between the client and vendor) with the success of the software outsourcing project were derived. The risk management practices will be the moderating variable between the independent and dependent variables.

The dependent variable is outsourcing success. It refers to achievability of the outsourcing goals such as cost efficiency and meeting the quality requirements. Outsourcing success is defined as "the satisfaction with benefits from outsourcing gained by an organization as a result of deploying an outsourcing strategy" (Grover, Cheon & Teng, 1996 p.95). Mahnke,

Overby and Vang (2003) p.23; Grover, Cheon and Teng (1996) summarized that the outsourcing success can be grouped into three categories which are strategic, economic and technological. Success in strategic category is referring to "the ability of the firm to focus on its core business and outsource the routine activities." Success in economics category is defined as "the ability of the firm to utilize expertise and economies of scale in human and technological resources of the vendor and manage its cost structure." Finally the success in technological category is described as "the ability of the firm to gain access to leading-edge IT and avoid technological obsolescence that results from changes."

Independent Variables   **Moderator**   **Dependent Variable**

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                                    ┌─────────────────────┐
                                    │  Risk management    │
                                    │     practices       │
                                    └──────────┬──────────┘
                                               │
┌─────────────────────┐                        │
│  Vendor competency  │──────────┐             │
└─────────────────────┘          │             │
                                 │             ▼
┌─────────────────────┐          │    ┌─────────────────────┐
│  Degree of          │──────────┼───▶│  Outsourcing success│
│  outsourcing        │          │    └─────────────────────┘
└─────────────────────┘          │
                                 │
┌─────────────────────┐          │
│  Contract duration  │──────────┤
└─────────────────────┘          │
                                 │
┌─────────────────────┐          │
│  Relationship       │──────────┘
└─────────────────────┘
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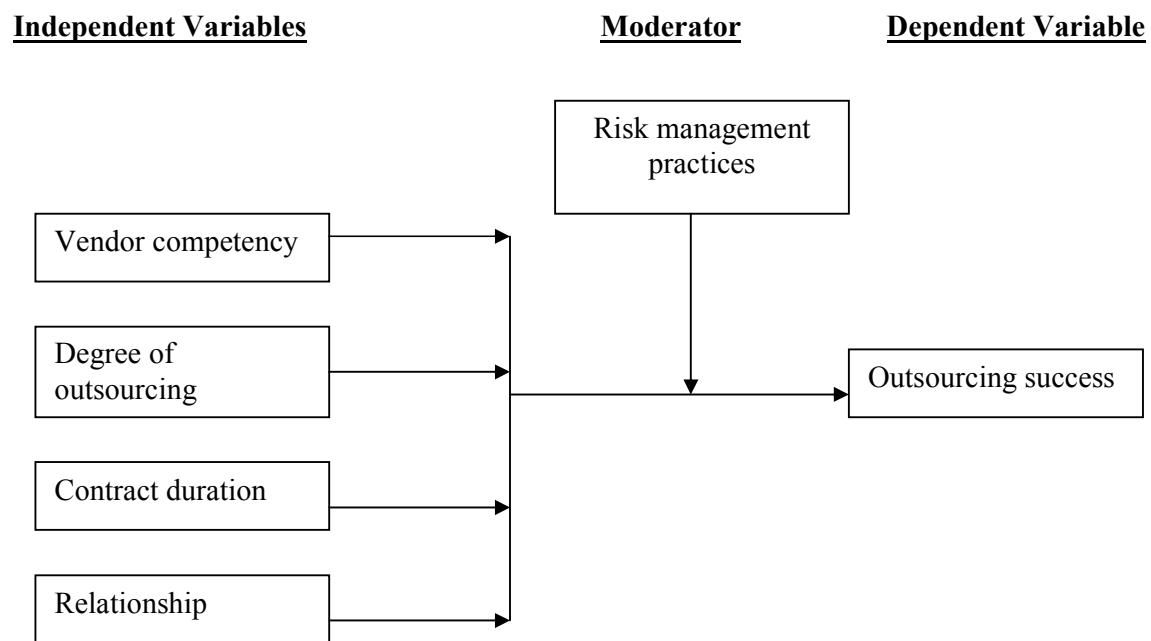
Figure 2.1. Conceptual model of relationship between the independent variables, moderating variable and dependent variable.

2.6.1   Vendor competency

The vendor competency is referring to the technical skills, process capability and the experience of the vendor in carrying out outsourcing project. Aubert et al. (1999) suggested that the vendor firm with high competency level and experience in outsourcing project will show high success rate for the completion of an outsourced project. DiRomualdo and Gurbaxani (1998) recommend that the client firm engaged in outsourcing activities need to ensure their vendor have the right mix of competencies and know – how knowledge. This will ensure that the vendor is able to deliver the services or products that meet the client firms' expectation and achieve success in the outsourcing project. Based on the literature, the vendor competency is an important factor for success of the outsourcing project

> Hypothesis 1 (H1): There is a positive relationship between vendors with high competency and the success of the outsourcing project.

2.6.2   Degree of outsourcing

The degree of outsourcing is referring to level of IS component being outsourced. It will determine whether the project involves total outsourcing or partially or only a specific segment was outsourced. Dibbern et al. (2004) summarized that the degree of outsourcing is higher when the project needs to be outsourced requires extensive knowledge and specialized skill sets. It is assumed that the third party vendor had advantage in terms of superior knowledge and economies of scale. They were able to leverage specialized skills among a

broader range of customers. So the degree of outsourcing decision is higher if the required specialized skills are not available in-house. Grover et al. (1996) mentioned that the degree of outsourcing will be positively related to the success of the project based on the resource dependence and transaction cost economics theory.

Hypothesis 2 (H2): There is a positive relationship between degree of outsourcing and the success of the outsourcing project.

2.6.3   Contract duration

The contract duration is referring to the length of the outsourcing contract given to a vendor. A study by Lacity & Willcocks (1998); Ellman (2006), shows that short term contract have higher success factor compared to the long term contract. Based on Burstow (1994), there are few factors that influence for shorter contract duration. The first factor is value for money concern. The client firm is looking for a service that the vendor is able to fulfill in shorter period of time.   Second factor is the flexibility for changes due to client firm business environment change. Shorter period of contract allow the client firm to have the flexibility to change over to another vendor.   Third factor is regarding the vendor performance. Shorter contract duration will protect the client firm from the vendors with poor performance by limiting the contract duration. Fourth factor is regarding technological changes. The client firm is protected against the risk of locked up with vendor that is using the aging technology. With shorter duration contract the client firm can quickly change over to another vendor with latest technology.

Hypothesis 3 (H3): There is a negative relationship between contract duration and the success of the outsourcing project.

2.6.4 Relationship

Relationship between the vendor and client plays an important role in the success of outsourcing project. The relationship is referring to the strategic partnership or buyer seller relationship between the vendor and client. Marcolin & McLellan (1998) in their study posits that there was higher rate of outsourcing success for strategic partnership relationship. Nguyen, Babar and Verner (2006); Blumenberg, Beimborn, and Koenig (2008); Arshad, Mohamed, A., and Nor (2007) posit that trust and communication are the most important factor for success in relationship between client and vendor which will indirectly translate to success of outsourcing project. The relationship factor is considered as critical for the success of the outsourcing project (Surgent, 2006; Grover et al., 1996).

Hypothesis 4 (H4): There is a positive relationship between the vender - client relationship and success of the outsourcing project.

2.6.5 Risk management practices

Risk management practices are referring to the actions taken by the client firm to mitigate, avoid or minimize the risk to the outsourcing project. A proper risk management will enable

the firm to reduce the effect of the risk when it occurs (MacCrimmon & Wehrung, 1986). Smith, McKeen and Staples (2001); Arshad, Lin, Mohamed and Affandi (2007), reveal that risk management will determine the success or failure of an outsourcing project and the risk management practices are on going process that needs to be integrated into outsourcing project management. Risk management practices using risk tracking tool such as Riskit method considered as effective way to manage risks on software development projects towards achieving its success (Freimut, Hartkopf, Kaiser, Kontio, and Kobitzsch, 2001).

Hypothesis 1a (H1a): The relationship between vendors with high competency and the success of the outsourcing project will be stronger when risk management practices are high.

Hypothesis 2a (H2a): The relationship between degree of outsourcing and the success of the outsourcing project will be stronger when risk management practices are high.

Hypothesis 3a (H3a): The relationship between contract duration and the success of the outsourcing project will be stronger when risk management practices are high.

Hypothesis 4a (H4a): The relationship between the vender - client relationship and the success of the outsourcing project will be stronger when risk management practices are high.

2.7 Summary

The theoretical framework of this study was described in this chapter. The factors that lead to the success of a software outsourcing projects were identified and described. The factors were vendor competency, degree of outsourcing, contract duration and relationship. Then the hypothesis regarding the relationship between the variables were derived based on the literature.