Impact of interdependence between supply chain partners on strategic alliance outcomes

Role of relational capital as a mediating construct

Murali Sambasivan
Graduate School of Management, Universiti Putra Malaysia, Selangor, Malaysia
Loke Siew-Phaik
Faculty of Business Management, UiTM Perak, Perak, Malaysia
Zainal Abidin Mohamed
Graduate School of Management, Universiti Putra Malaysia, Selangor, Malaysia, and
Yee Choy Leong
Faculty of Economics and Management, Universiti Putra Malaysia, Selangor, Malaysia

Abstract

Purpose – The aims of this paper are: to argue the role of Kelley's personal relationship theory (PRT) in explaining the maintenance and success of alliance outcomes; to argue the inclusion of communication between supply chain partners as a major component of relationship capital in addition to trust and commitment; to test the impact of interdependence between supply chain partners on strategic alliance outcomes; and to test the role of relationship capital as a mediating construct between interdependence.

Design/methodology/approach – A questionnaire was constructed and sent to 2,156 supply chain managers in Malaysia. The questionnaire captured three constructs: interdependence – task, goal and reward; relationship capital – trust, commitment, and communication; and strategic alliance outcomes – goal, value-creation, and re-evaluation. The companies were selected randomly from the Federation of Malaysian Manaufacturers (FMM) directory. Structural equation modeling (SEM) was used to test the hypotheses.

Findings – The major findings are: communication must be included as a major component of relationship capital in addition to trust and commitment; Kelley's PRT plays a prominent role in explaining the maintenance and success of strategic alliance outcomes; interdependence has a significant relationship with relationship capital; relationship capital has a significant relationship with strategic alliance outcomes; and relationship capital acts as a pure mediator between interdependence and strategic alliance outcomes.

Originality/value – This research contributes significantly to the theoretical and empirical developments that enrich the strategic alliance literature.

Keywords Supply chain management, Strategic alliances, Buyer-seller relationships, Partnership, Malaysia

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1. Introduction

Firms that compete in today's business environment form strategic alliances for various kinds of strategic goals. Through active engagement in a strategic alliance, a number of positive outcomes, ranging from acquisition of resources to creation of synergies, can be attained by several alliance partners (Todeva and Knoke, 2005). However, creating, developing and maintaining a successful alliance is a very daunting task. Parkhe (1993) argues that although the frequency of strategic alliance formation has increased, inter-firm linkages have been frequently accompanied by problems of instability, poor performance, and termination. The strategic alliances frequently face difficulties and experience problems because partners fail to develop an effective process for making joint decisions (Bamford *et al.*, 2003). Spekman *et al.* (1998) suggest that strategic alliance problems often converge on issues of equity, especially when partners try to equate efforts with rewards. Given that the rate of failure among strategic alliances is as high as 70 percent (Parkhe, 1993), it is important to identify and understand factors that affect the strategic alliance outcomes.

Strategic alliances have been well-explored and these studies have started as early as 1970s. According to Pfeffer and Salancik (1978), strategic alliances are a means for firms to acquire resources, given that not all necessary resources can be generated internally. Parkhe (1993) developed a strategic alliance model using game theory and transaction cost economics theory and this research built a foundation for future research. Since then, there have been many theoretical advances to analyze strategic alliances including resource-based perspective (Tsang, 1998; Das and Teng, 2000; Rungtusanatham *et al.*, 2003), relational views (Dyer and Singh, 1998) and social exchange theory (Young-Ybarra and Wiersema, 1999). Researchers have devoted their efforts to study a firm's motive to engage in inter-organizational collaborations and have attempted to identify the critical factors that make these collaborations successful.

Effective collaborative arrangements are considered to be a powerful tool for firms to remain competitive in today's business environment by enhancing market power, increasing efficiencies, accessing new or critical resources and entering new markets. While we have witnessed a proliferation of both academic and managerial articles concerning strategic alliances, research in this area is fragmented (Vyas *et al.*, 1995). Todeva and Knoke (2005) highlight that there are still many "unsolved" issues related to strategic alliances, but we do know that both formation of a strategic alliance and maintenance of such collaborative relationships are key to its success. In fact, a successful strategic alliance not only requires careful planning and partner selection at the beginning stage of alliance formation, but also skillful relationship management for long-term success and survival. Adequate measurements of strategic alliance outcomes help partnering firms overcome conflict situations and unexpected difficulties and increase alliances' success.

In this research, we study the effect of interdependence between supply chain partners on alliance outcome; and the role of relational capital as a mediating variable between interdependence and alliance outcome. The term relational capital refers to trust, commitment and communication between supply chain partners and we explain this term in the next section.

Existing literature on strategic alliance suggests that discussion need to focus more on managing the relationship in a strategic alliance in order to achieve a positive outcome. How partnering members act and react in a cooperative relationship spell success and failure for the entire strategic alliance. For instance, an efficient exchange of accurate information increases operational efficiencies and market responsiveness but inaccurate, distorted information exchange can result in excessive inventories and inefficiencies within the supply chain. Based on the inevitable evolution of the buyer-supplier relationships, several scholars have emphasized the importance of trust and commitment in building a robust relationship between partnering firms (Kingshott, 2006; Kwon and Suh, 2005; Morgan and Hunt, 1994). While business transactions in early 1980s relied more on governance mechanism based on arm-length relationships, the trend for interfirm relationships today has now shifted to collaborations based on information sharing, commitment and trust (Hoyt and Huq, 2000).

The contributions of this study are threefold. First, we argue the role of relational capital as a mediating construct between interdependence of supply chain partners and supply chain outcomes. Few researchers have established relationship between relationship capital and alliance outcomes (Cullen *et al.*, 2000; Kumar, 1996; Mohr and Spekman, 1994; Robson *et al.*, 2006) but the role of relationship capital as a mediating construct between interdependence among supply chain partners and alliance outcomes has not been explicitly tested. Second, this research has eclectically combined social exchange theory and Kelley's personal relationship theory to explain how interdependence between supply chain partners and relationship capital affect alliance outcome. Third, prior studies have utilized different types of measurement, including objective measures such as survival, termination, duration, financial gains; and subjective or process-oriented measures such as goal attainment, satisfaction, learning and competence building, to assess strategic alliance outcomes. Our research has underscored the importance of both outcome and process performance and concludes that the static performance (goal achievement and value creation) and the on-going performance (satisfaction from re-evaluation) are indicators for measuring the success of a strategic alliance. This research studies the relationships from manufacturers' perspectives.

This paper is organized as follows. Section 2 explains relational capital and its relevance in supply chain. Section 3 deals with the development of a theoretical framework and relevant hypotheses. Section 4 explains the methodology. Section 5 outlines the results of the study. Section 6 discusses the results in detail and section 7 gives the conclusions of the study.

2. Some prefatory remarks on relationship capital

According to Cullen *et al.* (2000), the "soft side" of strategic alliance management is critical to the success of strategic alliances. The "soft side" is referred to as relationship capital. Relationship capital deals with the quality of relationship that exists between partners. It "involves the pattern of interaction between partner firms that facilitates and allows for the effective functioning of alliance on a day-to-day basis" (Cullen *et al.*, 2000, p. 224). This implies that partners must invest sufficient time, effort and personnel to build the long-term relationship. Relationship capital ensures that the relationship between partners is much beyond arm's length contract.

Many researchers consider trust and commitment as the most important components in alliance relationship (Cullen *et al.*, 2000). These researchers argue that without these components a strategic alliance will fail to reach its strategic potential and objectives. With many of the alliances spanning across countries with varied cultures, the role of trust and commitment are of paramount importance. The role of culture in the development of relationship capital has been well addressed in literature (Brickley *et al.*, 1996; Mello and Stank, 2005; Sabel and Zeitlin, 1985; Sambasivan and Nget-Yen, 2010). According to Sambasivan and Nget-Yen (2010), culture plays a crucial role in building a strategic alliance relationship and hence promote or hinder formation of strong network ties. The strategic alliance relationship is built through mutual trust, commitment and communication between the alliance members. Studies have shown that both, national and organizational cultures have a significant impact on the relationship between alliance partners (Beugelsdijk *et al.*, 2006; Chakravarthy and Lorange, 1991; Rao and Swaminathan, 1995). However, this study does not include culture as one of its contructs under investigation.

Social exchange theory places the interactions between people and organization at the core of relationships. Just like any other relationship, communication is important for an alliance to be successful (Elmuti and Kathawala, 2001; Ohmae, 1992). It allows information exchange among and between members in the firms within strategic alliances (Mohr and Spekman, 1994). Interestingly, Ohmae (1992) notes that a strategic alliance is very much like a marriage; and the marriages are successful because of trust, commitment, and communication between the partners. The strategic alliances with high levels of trust encourage partners to engage in more open communication, information sharing and willingness to take risks. We acknowledge the following to be true:

- communication affects trust and commitment; the more the partners communicate, the more they trust and commit (in a positive way) or distrust and less committed to their partners (in a negative way);
- trust affects communication and commitment; the partners are willing to communicate and commit if they trust each other; and
- commitment affects trust and communication; the more committed the partners are, the more they are willing to communicate and to trust their partners.

3. Theoretical framework and hypotheses development

Social exchange theory is built on the hypothesis that human behavior is contingent upon the rewards between actors (Zafirovski, 2005). This theory was built as an answer to the topics that economics had trouble dealing with such as market imperfections (Emerson, 1976). According to Emerson (1976, p. 336), "the exchange approach in sociology is the economic analysis of noneconomic social situations". Zafirovski (2005, p. 32) argues that social exchange theory rests on the backs of utilatarian economics and psychological behaviorism as "partly compromized paradigms in social science rather than an autonomous theoretical endeavor". In summary, the social exchange theory is "basic behavioral assumptions of operant psychology and utility theory in economics regarding utility maximization, rationality, learning and deprivation-satiation". Can such a theory explain the maintenance and success of strategic alliances in a supply chain? The maintenance of strategic alliances must go beyond utilatarian economics. Therefore, we submit that social exchange theory can convincingly explain formation and initial success of strategic alliances but maintenance is a "different ball game". We believe that Kelley's personal relationship theory can help address the question on the maintenance and the success of strategic alliances in a supply chain.

Kanter (1994) asserts that relationships between companies begin, grow, develop, succeed – or fail – like relationships between people. Also, Spekman *et al.* (1998) emphasize the need for personal relations in order to define strategic objectives, to facilitate necessary communication between partners, and to strengthen ties between companies. Prior research has used marital or loving relationships to conceptualize and describe the evolution of buyer-seller relationships (Dwyer *et al.*, 1987). Holmlund and Törnroos (1997) add that relationships between alliance partners are often compared to marriages as opposed to affairs, which denote short-term exchanges and transactions. Therefore, we conclude that it is justifiable to relate theory of personal relationships to study inter-organizational collaborative agreements.

Personal relationship theory focuses on the appreciation of participant's perceptions of each other's traits and attitude in order to better understand the relationships of close pairs. Several concepts identified by Kelley (1979) such as interdependence, responsiveness and attribution are relevant for understanding relationships within strategic alliances. We suggest that the outcome of an alliance depends not only on what each of the partner does individually, but also on the joint decision and action of the alliance partners. We also argue that the concept of interdependence in personal relationship theory unfolds the essential elements necessary to promote communication, trust and commitment between partners that contribute to strategic alliance outcomes. Mutual interdependence created from a strategic alliance would minimize risks of one partner firm acting in its own interest since any move which adversely affects one partner would have adverse effects on the alliance as a whole (Spekman *et al.*, 1998). Previous studies (e.g. Wong *et al.*, 2005) provide evidence that cooperative interdependence between partners contribute to mutual success since such interdependence acts as a solid foundation for believing partners to be reliable and thus promoting activities for a successful strategic alliance. A firm's behavior is dependent on the prediction of how alliance partners will behave in certain situations. In order to benefit most from the alliances, the partners must be able to anticipate each other's actions. We expect that being responsive and considerate to the needs of the alliance partner when making decisions contribute to a more effective long-term relationship. This matches with what Kelley (1979) has proposed – a good personal relationship involves caring when one partner gives up short-term benefits or endures short-term costs out of consideration for the other. This is where, we believe that social exchange theory falls short and Kelley's personal relationship theory takes prominence in explaining maintenance of strategic alliances in a supply chain. In fact, social exchange theory and Kelley's personal relationship theory together explain the formation and maintenance of strategic alliances convincingly.

Indeed, partnering firms in an alliance rely on actions and behaviors as dominant signals of trust (Perks and Halliday, 2003). Nevertheless, firms engaging in an alliance often try to foresee and resolve in advance important management decisions that may arise in the future but the complexity and uncertainty inherent in alliances prohibit the firms to do so and thus, the burden of collaboration shifts to the alliance governance (Bamford *et al.*, 2003).

Success of a collaboration can hardly be guaranteed by the exercise of hierarchical power since the parties are not formally subjected to the authority of each other; in fact, they are likely to treat such attempt at dominance with mistrust and suspicion (Mintzberg *et al.*, 1996). Mintzberg *et al.* (1996) further point out that prior research has confirmed that the power imbalance between collaborative partners is one of the main reasons for inter-organizational collaboration failure. Dyer and Singh (1998) distinguish two classes of governance used by alliance partners:

(1) third-party enforcement of agreement such as legal contracts; and

(2) self-enforcing agreement where there is no intervention from third party to determine whether a violation has taken place.

According to Dyer and Singh (1998), within the self-enforcement class of governance structure, there are formal safeguards (such as financial and investment hostages) and informal safeguards (such as goodwill trust), and these informal self-enforcing agreements may rely on personal trust relations or reputation as governance mechanisms. Certainly, firms will try to lower their trust in their partners if they encounter opportunistic behavior and this type of psychological process may occur unconsciously or semi-consciously in the minds of the members of either or both firms (Kwon and Suh, 2005). Bamford *et al.* (2003) add that the success of a strategic alliance is attributed to the fact that people working in it have an opportunity to see each other often and interact at an interpersonal level. This helps the alliance partners to know each other, to trust each other and to like each other. Thus, drawing the concept of interdependence from personal relationship theory (Kelley, 1979), we suggest that the joint decision and action of the alliance partners is a necessity for building good communications and trust and maintaining a strong and effective strategic alliance relationship. Therefore, our assertion that we the need to look beyond the corporate identity of partnering firms while forming and maintaining alliance relationships stands vindicated. The conceptual framework used in this research is given in Figure 1.

3.1 Relationship between interdependence and relationship capital

Prior researchers have examined the roles of social exchanges such as reciprocal resource commitment and relational influences between partners in ensuring collaboration and alliance success (Muthusamy *et al.*, 2007). The role of interdependency between firms and their partners in changing the future actions of business partners have been studied (Dwyer *et al.*, 1987). In order to better understand such dynamic transition, interfirm exchanges shall therefore be viewed and examined from other perspectives. As argued by Hoyt and Huq (2000), p. 750), "as new forms of

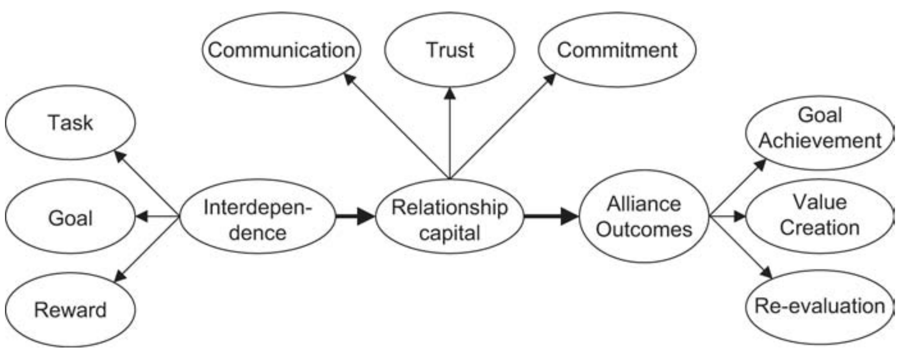


Figure 1.
Research framework

buyer-supplier relationships emerge, new organizational paradigms must be developed to explain their evolution and how these changes affect future performance".

Interdependence generally refers to the belief that the outcomes of a relationship depend largely on both the individual and the joint actions that people in a dyad undertake. Previous research has considered three "interdependence" constructs to be important: task interdependence, goal interdependence, and reward interdependence.

Task interdependence refers to the extent to which the behavior of one self affects the performance of others. Wageman and Baker (1996) have defined task interdependence as the degree to which an individual's task performance depends upon the efforts or skills of others. Task interdependence reflects how regular group members exchange information and means in order to complete group tasks (Van Vijfeijken *et al.*, 2002). For example, production of an automobile model X requires different components from a strategic supplier A, the operation can only be executed and completed when the materials and information from supplier A are provided. Vijfeijken *et al.* (2002) have noted that group members tend to co-operate (exchange information and means) for completing the group task when task interdependence is high.

Goal interdependence illustrates the way in which goal accomplishment of an individual/organization is affected by the goal achievement of others (Van Vijfeijken *et al.*, 2002), e.g. jointly develop a new product to capture certain niche markets. Johnson *et al.* (2001) have argued that positive goal interdependence happens when individuals/organizations perceive that their goals are achieved only if the other individuals/organizations (that are working cooperatively) achieve their goals.

On the other hand, reward interdependence, also known as joint reward, assumes that the reward achievement by others influences the reward achievement by an individual (Van Vijfeijken *et al.*, 2002). This happens when the success and organizational performance of the strategic alliance partners are dependent on each other, e.g. Firm A will only gain and make profit if its partner firm is performing well and yield a return. Since the rewards achievement by a group affects the rewards achievement by individuals in the group, reward interdependence is said to be the function of a distribution of work outcomes (Wageman and Baker, 1996).

Strategic alliances partners with high levels of task interdependence tend to communicate more frequently. Communication allows information exchange among members within the strategic alliances (Mohr and Spekman, 1994; Young-Ybarra and Wiersema, 1999). Effective information sharing includes exchange of critical, often proprietary, information (Mohr and Spekman, 1994). Monczka *et al.* (1998) have argued that both information quality and participation are critical for strategic alliance members to coordinate their business activities and work together to exploit their collective competitive advantages. When the strategic alliances partners share similar business goals, such goal interdependence enables partners to communicate their role and functions in task completion. An effective information exchange increases performance and promote trust-building within the collaborative arrangement. Since each party depends on one another to satisfy mutual goals, trust is the glue that keeps business partners together. Reward interdependence encourages all strategic alliance partners to jointly work toward their organizational objectives. Shared benefits and gains drive these partners to continue to work together to reduce cost and to improve products and services through information sharing, mutual trust and commitment. Following these arguments, it is hypothesized that:

H1. The higher the task, goal and reward interdependency within a strategic alliance relationship, the higher the relationship capital between partnering firms.

3.2 Relationship between relationship capital and strategic alliance outcomes and the role of relationship capital as a mediator

Communication with frequent and relevant information sharing enhances the partners' abilities to act independently in maintaining the relationship over time (Mohr and Spekman, 1994) but at the same time allow partners to understand the alliance goals, roles and responsibilities in coordinating their supply chain and business activities. Communication is important for an alliance to be successful (Elmuti and Kathawala, 2001; Ohmae, 1992) as it signals the partner firms' current plan and future intentions (Mohr and Spekman, 1994). Trust relates to expectations about the positive motives and of the partner whereas confidence deals with the perceived level of certainty that the partners will act in a desirable manner (Das and Teng, 2000). High level of trust facilitates the understanding of expectations for cooperation and planning in a relational contract (Dwyer *et al.*, 1987). The concept of commitment has been identified as an important element in social exchange literature (Thibaut and Kelley, 1959). A positive relationship outcome requires commitment from all parties because anticipation of future outcomes is expected to enhance reciprocity and helps maintain stability and commitment between parties (Kingshott, 2006). Firm's constructive behaviour such as trust and commitment are essential for achieving partnership success (Morgan and Hunt, 1994; Mohr and Spekman, 1994). Without these critical constructs, business relationships are inclined to become fragile and vulnerable (Kwon and Suh, 2005). Interestingly, Ohmae (1992) notes that a strategic alliance is very much like a marriage; although there are guidelines and expectations, no one expects a precise, measured return on the initial commitment. Both partners must firmly believe that they will be stronger than they would be separately and both must work diligently over time to bring success to the union.

Firm behavior issues such as trust and commitment are recognized in prior studies to be the main building blocks of strategic alliance effectiveness (Spekman *et al.*, 1998; Kwon and Suh, 2005; Mohr and Spekman, 1994). These mutual trust and commitment between partners are recognized to be an important element by managers from *both* failed and successful strategic alliances (Cullen *et al.*, 2000). Based on the above arguments, we posit:

H2. The higher the relationship capital between partnering firms, the greater the strategic alliance outcomes.

Das *et al.* (2003) have argued that interdependence between supply chain partners is crucial to strategic alliance performance as it leads to increased commitment, communication and trust. It also helps firm achieve benefits that can only be attained by both parties but not by individual parties (Mohr and Spekman, 1994) through the role of relationship capital (Cullen *et al.*, 2000).

H3. Relationship capital mediates the relationship between interdependence between supply chain partners and strategic alliance outcomes.

4. Methodology

4.1 Survey instrument

The survey items in this study were developed based on previous studies. Three variables were tested:

(1) interdependence;

(2) relationship capital; and

(3) strategic alliance outcomes.

All of these variables were measured using its own dimensions and Table I gives the dimensions used in this study.

The interdependence was assessed by using five-point Likert scale (1 = very low to 5 = very high). This construct attempts to measure the extent of mutual interdependency between responding firm and its alliance partners in terms of task, goal and reward interdependency. The relationship capital measures the extent of trust, communication and commitment associated with the alliance relationships. Three dimensions were used to conceptualize communication:

(1) information quality;

(2) information participation; and

(3) information sharing.

While information quality was measured using five-point Likert scale (1 = very low to 5 = very high), the information participation and information sharing were measured using five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The measurement of trust was adopted from prior studies (Young-Ybarra and Wiersema, 1999) in an attempt to capture the multidimensionality of the trust concept. Commitment reflects an enduring desire to maintain a relationship deemed to be important. In this study, both the scores of trust and commitment toward the partnering firms were measured using five-point Likert scale (1 = strongly disagree to 5 = strongly agree).

The area that has received increasingly more attention from the researchers in strategic alliance concerns the measuring of alliance outcomes. Prior studies have utilized different types of measurement to assess strategic alliance outcomes such as survival, termination, duration, financial gains; and subjective or process-oriental measures such as goal attainment, satisfaction, learning and competence building. Although termination of a strategic alliance is a natural part of the strategic alliance life cycle (Bamford *et al.*, 2003), strategic alliance termination seems to be an unreliable measure for strategic alliance success. Even strategic alliance performance remains one of the least understood aspects of strategic alliances, identification and comprehension of the strategic alliance outcomes are critical in order to ensure success of these collaborative arrangements. In this study, the measurement of strategic alliance outcomes includes the measures of the outcome performance (goal achievement and value creation) and process performance (satisfactory from re-evaluation). Scores for all of the strategic alliance outcomes were measured using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree).

Variables	Definition	Items
Interdependence		
Task interdependence (TI)	Task interdependence refers to the extent to which the strategic alliance partners depend on information/ means from each other for the completion of (their part of) the strategic alliance task	Our firm and our partner firm depend heavily on the information from each other for task completion Our firm and our partner firm depend heavily on the means, e.g. techniques and facilities, from each other from the completion of tasks
Goal interdependence (GI)	Goal interdependence refers to the extent to which the strategic alliance partners have related and compatible goals; and they work in term of "swim or sink" together	The dependency on our partner and for the exchange of information or/and means is so critical that its absence would hamper satisfactory achievement of our goals
Reward interdependence (RI)	Reward interdependence refers to the extent to which reward achievement of individual strategic alliance partners has influence on the reward achievement of the whole alliance relationship	We "swim and sink" with our partner firm We seek compatible goals with our partner firm Our goals and those of our partner firm go together When we work together with our partner, we usually have common goals The success of our firm has little impact on our firm Our goal achievement is significant to our partner Our reward achievement is dependent on the achievement of our partner firm
Relationship capital		
Communication	Communication quality refers to the communication attributes between strategic alliance partners in terms of timeliness, accuracy, adequacy, completeness and credibility Information Sharing refers to the extent to which critical, often proprietary, information is communicated to one's strategic alliance partner Participation refers to the extent to which the participation of partner firm in the following activities: goal setting, planning, forecasting and decision-making, in order to establish mutual expectations and cooperation	We are committed to the relationship with our partner firm The relationship that our firm has with our partner firm is something our firm intends to maintain indefinitely The relationship that our firm has with our partner firm deserves our firm's maximum effort to maintain When we encounter difficulties or new situation, our firm does not feel worried or threatened by letting out partner firm do what it wants Our firm is familiar with the patterns of behavior our partner firm has established, and we can rely on them to behave in certain ways We have found that our partner firm is dependable
Trust	Trust is characterized by three components: dependability, predictability, and faith. "Dependability refers to expectations that the partners will act in the strategic alliance's best interest, predictability refers to consistency of actions by partner while faith refers to the belief that the partners will not act opportunistically, even in unforeseen or novel situation" (Young-Ybarra and Wiersema, 1999, p.443)	Information quality – timeliness, accuracy, adequacy, completeness, credibility We actively seek advice and information from our partner The partner firm participates in our planning and goal setting activities We actively encourage improvement suggestion from our partner Our partner firm share proprietary information with us We inform our partner firm in advance of changing needs In our relationship, it is expected that any information which might help the other party will be provided
Commitment	Commitment is an exchange partner believing that an ongoing relationship with another is so important to warrant maximum efforts at maintaining it; and the committed party believes the relationship endures indefinitely	The parties are expected to keep each other informed about events or changes that may affect the other party It is expected that the parties will only provide information according to pre-specified requirement The partner keeps us fully informed about issues that affect our business

(continued)

Table I.
Variable definitions

Table I.

Variables	Definition	Items
Outcomes		
Goal achivement (GA)	Goal achievement refers to the extent to which the realization of the goals (common and private) for the strategic alliance	We are able to accomplish the goals of our strategic alliances We are satisfied with what we want from the strategic alliances
Value creation (VC)	Value creation refers to the value that is captured or created from the strategic alliance through: building a new business when the risks are high, skills are incomplete/ speed is essential; allowing company to remain focused on its core product or service while reaching a huge number of new customers; creating skills and learning that are the building blocks of future competitive advantage; helping firms to gain scale like traditional mergers and acquisition; transforming the relationship between a company and its suppliers; creating advantaged networks; cutting down costs; improving productivity; improving profitability	The strategic alliance helps us to realize our business objectives The strategic alliance builds new business opportunities/new products The strategic alliance accesses skills and learning for future competitive advantages The strategic alliance improves supplier or customer relationship The strategic alliance creates advantages networks with other firms The strategic alliance improves productivity The strategic alliance improves profitability This strategic alliance is still the right one even when we consider other activities that may have changed since we started it When we look at the other partner options, this partner firm is the right one considering what is really involved
Satisfaction from re-evaluation (RE)	Re-evaluation refers to the situation where strategic alliance partners measure and assess the relationship (supportive or destructive) to ensure the attainment of outcome performance. The level of process performance is reflected by the level of satisfaction towards the relationship after the re-valuation	The subject matter for this strategic alliance is still valid This strategic alliance relationship has become so important that we need to dedicate designated resources for this relationship

4.2 Subjects and data collection

Questionnaires were sent to 2,156 senior executives that were related to supply chain management, e.g. operations managers, plant managers and factory managers. The sample companies were selected randomly from the listing of the Federation of Malaysian Manufacturers directory. A total of 228 questionnaires were received, whilst seven were deemed unusable due to uncompleted data. The final response rate accounted for 10.5 percent in which 146 respondents have strategic alliances with their suppliers; 36 respondents have strategic alliances with their customers; and 39 respondents have strategic alliance with both suppliers and customers. A total of 260 strategic alliances (149 + 36 + 39) have been considered in this study. Since the response rate was less than 30 percent, we checked to see whether there was any non-response bias. We compared the means of the important constructs (interdependence – task, goal and reward; relationship capital – trust, commitment and communication; alliance outcome – goal, value creation and re-evaluation) between the first and third waves of responses. We found that there were no significant differences between the means. We also compared the demographic characteristics between the first and third wave of responses and did not find significant differences between the characteristics.

4.3 Reliability and validity

A reliability test on all the constructs used in the study was performed and the Cronbach alpha values fell between 0.808 and 0.920 except for reward interdependence that had a value of 0.734. Confirmatory factor analysis (CFA) was performed on all the dimensions of the constructs that had more than three items. The results are as follows:

- goal interdependence [$\chi^2 = 4.10$, df = 9, p-value = 0.23, GFI = 0.99, RMSEA = 0.064];
- communication-information quality [$\chi^2 = 2.54$, df = 5, p-value = 0.80, GFI = 1.00, RMSEA = 0.00];
- communication-information sharing [$\chi^2 = 27.66$, df = 9, p-value = 0.067, GFI = 0.97, RMSEA = 0.089];
- strategic alliance outcomes-value creation [$\chi^2 = 42.02$, df = 14, p-value = 0.056, GFI = 0.96, RMSEA = 0.085]; and
- strategic alliance outcomes-satisfaction from re-evaluation [$\chi^2 = 0.18$, df = 2, p-value = 0.90, GFI = 1.00, RMSEA = 0.00].

5. Results

Descriptive statistics in the form of means and correlations are given in Table II. The mean scores of two variables that deserve mention are: trust and value creation. Trust has an average score of 10.7 out of a possible 20 and value creation has an average of 22.5 out of possible 45. These scores indicate the skepticism that is prevalent among supply chain partners in Malaysia. A plausible reason can be that inter-firm relationships such as strategic alliances have not matured in developing countries like Malaysia. All correlations between variables are signficant.

Structural equation modeling (SEM) to test the relationship between the constructs and Sobel's test to test the mediation effect were used. SEM is considered a confirmatory analysis for testing and potentially confirming theory. Although many researchers have used SEM to examine a theoretically proposed model, Williams *et al.* (2004) have been

Table II.
Mean values and correlations

	Items	Mean	SD	1	2	3	4	5	6	7	8	9
Communication	16	49.5	10.1	1								
Trust	4	10.7	2.59	0.85*	1							
Commitment	5	10.7	2.55	0.84*	0.80*	1						
Task interdependence	3	10.2	3.71	0.80*	0.75*	0.82*	1					
Goal interdependence	4	13.2	2.46	0.85*	0.81*	0.80*	0.78*	1				
Reward interdependence	3	10.4	2.47	0.80*	0.76*	0.74*	0.71*	0.82*	1			
Goal achievement	3	10.9	2.47	0.85*	0.81*	0.79*	0.76*	0.81*	0.79*	1		
Value creation	9	22.5	6.14	0.84*	0.76*	0.77*	0.72*	0.78*	0.74*	0.79*	1	
Re-evaluation	4	14.0	3.23	0.82*	0.78*	0.76*	0.74*	0.78	0.74*	0.82*	0.80*	1

Note: *Significant at 0.01 level

critical of most studies, in that they have failed to compare or re-specify the proposed model with an alternative model to test a variety of different theoretical propositions. Therefore, model re-specification by citing theoretical support for the changes made is desired. In the present study, an alternative model was tested against current proposition in order to arrive at a model with the best possible fit. This alternative model included the predictive part between interdependence and strategic alliance outcomes.

While there is a lack of consensus on how best to evaluate the extent to which a proposed model fits the data, Shook *et al.* (2004) noted that, when assessing the fits of measurement models, fit indices such as chi-square statistics, the goodness-of-fit index (GFI), the comparative fit index (CFI), and the root mean square residual should be included, but that very few studies have used multiple fit indices, as suggested by Hair *et al.* (2006). The fit indices used in this study for assessing the measurement model included the following:

- χ^2 value and the associated *df*, GFI, CFI, RMSEA, RMR; and
- χ^2/degrees of freedom ratio.

Fit index values (e.g. GFI and CFI) greater than 0.90, RMSEA and RMR lower than 0.08 and a χ^2/degrees of freedom ratio less than 3.00 have been recommended to indicate good model fit (Hair *et al.*, 2006).

5.1 Measurement model (stage 1)

A total of nine indicator variables were used to estimate the measurement model: three for interdependence, three for relationship capital and three for strategic alliance outcomes. Therefore, a three-factor model was tested with the indicator variables constrained to their variable groupings. Results showed that all measurement model factor loadings were statistically significant at significance level of 1 percent, indicating adequate convergent validity:

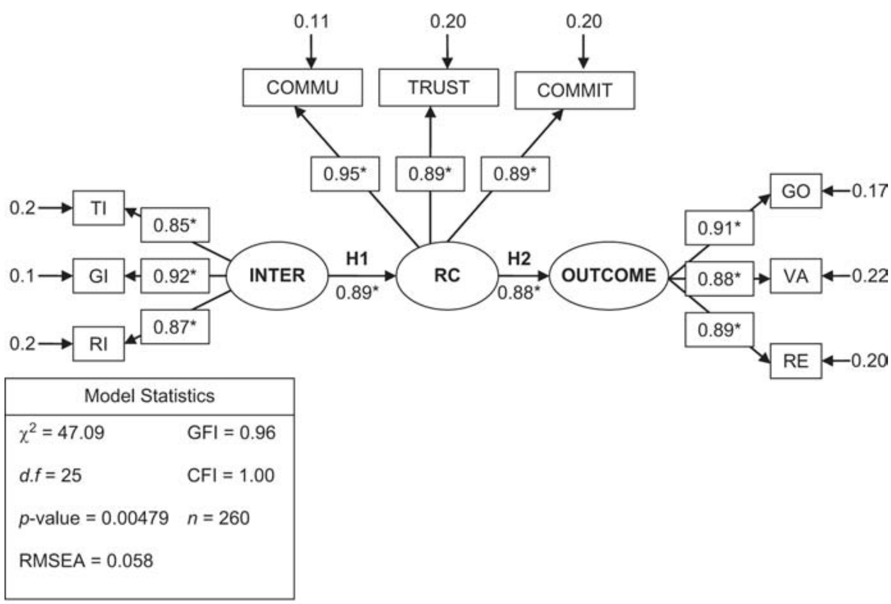
- task, goal, reward as indicators for latent variable interdependence;
- communication, trust, commitment for latent variable relationship capital;

- goal achievement, value creation and satisfaction of re-evaluation for latent variable strategic alliance outcomes.

5.2 Structural model (stage 2)

The path analysis results showed that the overall fit of the model was adequate ($\chi^2 = 47.09$; df = 25; p-value = 0.048; GFI = 0.96; CFI = 1.00; RMSEA = 0.058; RMR = 0.015; χ^2/degrees of freedom ratio = 1.88). As specified in the alternative model, adding a path directly from interdependence to strategic alliance outcomes resulted in a worse fit and dropped from further consideration.

Examination of the predictive relationships between interdependence, relationship capital and strategic alliance outcomes yielded strong support for the proposed structural model. Figure 2 reveals that all proposed structural paths are significant at 0.05 level, therefore provide supports for *H1* and *H2*. Specifically, the findings of this study underscore the crucial role of task, goal and reward interdependence, communication, trust and commitment in predicting strategic alliance outcomes. The interdependence has a significant effect on the relationship capital (t-value = 19.71, $p < 0.01$) supporting *H1* – the higher the task, goal and reward interdependency within a strategic alliance relationship, the higher the level of relationship capital between partnering firms. The relationship capital displays a significant effect on strategic alliance outcomes (t-value = 25.76, $p < 0.01$) indicating the importance of communication, trust and commitment for strategic alliance partners to attain a high level of alliance outcomes. This supports *H2* – the higher the relationship capital



Notes: *Significant at 0.01 level. INTER – Interdependence, TI – Task Interdependence, GI – Goal Interdependence, RI – Reward Interdependence, RC – Relationship Capital, COMMU – Communication, COMMIT – Commitment, OUTCOME – Strategic Alliance Outcome, GO – Goal Outcome, VA – Value-added Outcome, RE – Re-evaluation

Figure 2.
Path analysis results

between partnering firms the higher the strategic alliance outcomes. Figure 2 gives the complete results of path analysis. In order to test the meditaing role of relationship capital, we have performed the three-step procedure suggested by Baron and Kenny (1986) and Sobel's test. Based on the test, relationship capital is a strong mediator (t-value = 15.65, p-value = < 0.01) between intedependence and strategic alliance outcomes and this supports *H3*.

6. Discussion

To date, researchers primarily have examined the motives for strategic alliance (e.g. Tsang, 1998) and alliance management (e.g. Das and Teng, 2000; Monczka *et al.*, 1998; Wong *et al.*, 2005). Despite the high failure rate of strategic alliances, successful collaborative arrangements among firms are still considered to be a powerful tool for firms to remain competitive in today's business environment. An effective strategic alliance requires not only planning and partner selection at the beginning stage of alliance, but also needs to focus on managing the alliance for its survival and success. Based on this concern, our paper serves to provide a greater understanding on management of a strategic alliance relationship. Our work also follows Robson *et al.* (2006) call for more studies in embracing the behavioural paradigm to study strategic alliances. Prior works (Mohr and Spekman, 1994; Robson *et al.*, 2006) have established a strong link between relationship capital (e.g. trust and commitment) and strategic alliance performance. Findings from this present study suggest that the high levels of task, goal and reward interdependence, between strategic alliance partnering firms serve as powerful antecedents to relationship capital and positively impact the levels of communication, trust and commitment between partnering firms and thus on the strategic alliance outcomes.

Within the personal relationship theoretical perspective, Kelley (1979) has highlighted that the issues of benefit and cost by considering both the individual's action and the joint actions by two parties. While prediction of how others will respond and behave in certain situations determines one's behavior, the fundamental notion of interdependence is that mutual dependence would restrict and control the patterns of their actions and responses to the actions. These partners are more likely to adapt and compromise when encountered with problems or conflicts because they both understand that each party's action and the combination of their actions affect the outcomes of both parties as highlighted by Kelley (1984).

It is found that, in this study, interdependence greatly facilitates the interaction process and activities coordination between the strategic-alliance partners as these partners believe that working collectively bring more benefits than by working individually. Johnson and Johnson (1989) suggest that improved collaborative learning, interpersonal relations and group member's achievement are some of the benefits of interdependence. Partners that are highly interdependent on each other tend to be more willing to share information, to trust and commit to the collaborative relationships (Das *et al.*, 2003; Mohr and Spekman, 1994). Van der Vegt *et al.* (2001) have found that high task interdependence lead to high job and team satisfaction under the situation where goal interdependence within the work team is high. Haines III and Taggar (2006) have argued that members with a high belief in teamwork value perceive that teams can produce better performance rather than working alone. In this study, we have noted that goal interdependence within a strategic alliance reflects the partner's orientation toward setting compatible goals and consistently aim to work collectively. It provides a solid foundation for shaping interaction processes and activities coordination such as information sharing. It also discourages the partnering firms to behave competitively or opportunistically across all situations. The level of reward interdependence between the strategic alliance partners is found to have a profound effect on the levels of communication, trust and commitment. Shared benefits promote joint working relationships as these strategic alliance partners strive together for continued cost reduction and improved customer satisfaction through effective information sharing, mutual trust and commitment. When the performance of the individual partnering firms has a positive impact on the overall alliance performance, it does not only enhance more interactive and repetitive exchanges between these partners, but also makes their relationships intertwined. Generally, interdependency within a strategic alliance relationship promotes deeper integration through stronger relationship capital since the partnering firms are motivated to act proactively to achieve the win-win result.

By exploring how improved collaborative relationships will be effective in realization of benefits of strategic alliance partners, our research findings enhance scholars' understanding in these areas. Specifically, we found that high levels of trust, communication and commitment are valuable in creating truly productive and profitable relationships that lead to a higher level of strategic alliance outcomes. We have also found that these three components of relationship capital are highly inter-related. An effective communication between strategic alliance partners contributes greatly to goals achievement in both individual firm goal and mutual goals established by these partners. We have found that firms' behavior directed toward higher relationship capital facilitates an optimal planning for product and information flows. These effective exchange and coordination are powerful for firms to reduce costs as well as creating new value and synergies between strategic alliance partners. Findings in this study are consistent with previous studies. For examples, Parkhe (1993) and Cravens *et al.* (2000) suggest that frequent interactions can strengthen the ties among strategic alliance partners and promote cooperation that result in positive outcomes. In a more recent study by McCarter and Northcraft (2007), they have found that communication among members within the supply chain alliance offers an opportunity to elicit promises of cooperation and thus increases the likelihood of the alliance success. Our research suggests that trust, commitment and communication between strategic alliance partners have important implications for the strategic alliance outcomes. This is because such strong willingness to work together is particularly useful to overcome challenges and conflicts along the pathway of collaboration. Strategic alliance partners that are committed often act upon the benefits of the alliance as a whole, they are able to see themselves "being in the same boat" and react as a team player.

In this study, using data of 260 strategic alliances in Malaysian manufacturing industry, we proposed and tested a model in examining the relationships between interdependence, relationship capital and alliance outcomes. Our study contributes to theory building in this research area and provides suggestions to managers to improve the collaborative relationships, which lead to greater level of strategic alliance outcomes.

From the theoretical point-of-view, first, our review of the alliance research, especially of the past ten years, has shown that it is essential to consider the behavioral aspects of the alliance partners in the process of managing the collaborative relationships. This research thus answers recent calls to examine strategic alliances in a behavioral context by highlighting the importance of interdependence in influencing the relationship capital and subsequently on the alliance outcomes. Second, our research has eclectically combined Kelley's personal relationship theory and social exchange theory to develop an understanding of how interdependence and relationship capital affect the performance of a strategic alliance. Third, this research has argued and demonstrated the role of relationship capital as a mediating construct. Why is this important? Interdependence, on its own, does not enhance strategic alliance outcomes significantly. It is through the role of relationship capital that strategic alliance outcomes are improved. Fourth, our research has utilized outcome and process performance measures for strategic alliance outcomes.

This research study provides some practical insights into the relationships between the interdependence, relationship capital and strategic alliance outcomes. Although prior studies emphasize the critical success factors for a strategic alliance, it is equally important to identify the underlying mechanism that drives these partners to work together. First, we suggest that managers can achieve higher level of communication, trust and commitment between the partnering firms by leveraging the levels of task, goal and reward interdependence. Managers are advised to understand each partner's vision and ultimate goals, and jointly set objectives and plans to achieve these goals. A clear identification of partners' task and responsibility may improve resources allocation and ultilization while simultaneously reducing conflicts and misunderstanding. It is also important for the managers to acknowledge the impact of reward interdependence and how such mutual dependence can positively affect the relationship capital. Second, our findings may motivate managers to achieve greater strategic alliance outcomes by engaging in the following behaviors:

- to share and exchange quality information among partnering firms;
- to provide support to each other and allow the collaborative relationship to grow and to build trust;
- to foster stronger ties among partners and enhance deeper commitment; and
- to communicate frequently with supply chain partners.

Third, by adopting a more comprehensive measure (using both outcome and process performance) in evaluating strategic alliance outcomes, managers now have more information to gauge any additional potential conditions and areas that can improve the relationships and overall performance. We expect that the process performance will play a more important role in today's highly competitive and ever-changing business environment. Partners therefore, need to be constantly updated about the alliance performance and they need to respond appropriately and promptly.

7. Conclusion

This research aimed to examine the relationships between interdependence, relationship capital, and strategic alliance outcomes as perceived by the managers of Malaysian manufacturing firms that are involved in strategic alliance arrangement. Results obtained from the structural model indicate that three constructs of interdependence (task, goal reward) have positive impact on the three constructs of relationship capital (communication, trust and commitment). Higher level of relationship capital, in turn, positively affects the three constructs of strategic alliance outcomes (goals achievement, value creation and satisfaction from re-evaluation). While this study highlights some interesting findings and implications, the limitations of this study should be noted to enhance the quality of future research. First, the sample in this study consisted 228 of manufacturing firms registered with Federation of Malaysian Manufacturer and may not be fully generalizable to the broader Malaysian manufacturing industry. Second, the cross sectional data was used in this study. Since a collaborative relationship evolves rapidly, future study should adopt the longitudinal approach to capture the dynamic evolution of the strategic alliance despite of the usefulness of process performance measurement. Further research is necessary to expand the range of sectors in which strategic alliances are formed. Nevertheless, this study provides empirical evidence that helps to advance our understanding of how interdependence and relationship capital contributes to a successful strategic alliance.

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About the authors

Murali Sambasivan is an Associate Professor at the Graduate School of Management, UPM. His areas of interests are operations management, management science and statistics. Murali Sambasivan is the corresponding author and can be contacted at: murali@econ.upm.edu.my

Loke Siew-Phaik is a Lecturer at the Faculty of Business Management at UiTM. Her main fields of interest are in operations management and supply chain management.

Zainal Abidin Mohamed is a Professor at Graduate School of Management, UPM. He has interest in the areas of strategic management and operations management.

Yee Choy Leong is a Senior Lecturer at Faculty of Economics and Management, UPM. His areas of interests are operations management and supply chain management.