

## RELATIONSHIP DEVELOPMENT AND CONSTRUCTION SUPPLY CHAIN MANAGEMENT PERFORMANCE: THE MALAYSIAN SCENE

FAISAL ZULHUMADI, ZULKIFLI MOHAMED UDIN  
*UUM College of Business, Universiti Utara Malaysia*

### ABSTRACT

*As business operations expand in scope and borders, many successful companies of today are exploring new ways of gaining ground over their competitors in the market. These companies have to operate within the context of the environment that they are in, and in some countries, there are specific laws and situational factors that may influence how successful a company can operate. More to the point, this paper addresses some issues concerning the applicability of supply chain management in the context of the construction industry, with Malaysia being the backdrop to this research effort. More specifically, this paper will present the results of an initial effort in exploring the Construction Supply Chain Management (CSCM), focusing on the relationship development between the main players in the industry, namely the developer/client, contractor, and supplier. From the results of the study, it was revealed that there were several issues that have an effect on the success of the company which must be addressed, namely the issues of trust, information flow, and collaboration. A discussion based on these findings, which was obtained through a mix of qualitative and quantitative approaches, is also presented. Finally, this paper rounds off the research with a conclusion and some recommendations for future endeavours.*

**Keywords:** construction supply chain management, relationship development, Malaysian construction

### INTRODUCTION

The successful companies of today continue to grow in size and operations, and with the advent of globalisation, more companies are facing greater challenges in trying to conquer a larger share of the market. In the industrial sector, companies are moving away from concentrating on just their products to a more holistic approach whereby they shift their focus on the processes internal and external to their company. No longer are successful businesses looking to improve just themselves, but also improve their immediate partners upstream and downstream of their. This is where Supply Chain Management (SCM) has been touted as perhaps the next viable way of gaining this advantage.

The SCM concept has been applied and proven successful empirically in the manufacturing sector, covering many industries including the food, textile, and healthcare industries to name but a few. However, there were also some concerns raised over the applicability of such an approach. There are also efforts being made to explore its promising applicability in other sectors, as the focus of this paper, the construction industry.

The Malaysian government, through its construction arm, Construction Industry Development Board (CIDB), has released the Construction Industry Master Plan (CIMP) which details out the national strategy to accelerate the development of the construction industry in Malaysia. One of the thrusts of the CIMP is the implementation of SCM in the Malaysian construction industry, where all the players along the supply chain should take initiatives in continuously improving all the processes along the supply chain starting from the producer or supplier, all the way to the end with the developer or client.

Of the many aspects of SCM, this paper focuses on the relationship development or rather its effect on the organisation. Relationship development has been highlighted in the literature as one of the key concepts in SCM which have a great influence on the successful implementation of the SCM, regardless

of the industry it is being applied in. In the context of this paper, the effect of relationship development will be explored in the context of supply chain performance and business performance.

The next section will organise and present previous literature regarding the above mentioned concepts, which is then followed by the method section, results and discussion, and to complete this paper, the conclusion and further recommendations are put forward.

## **LITERATURE REVIEW**

Supply chain management (SCM) was once a too-good-to-be-true concept where its ideals required much change and were too difficult to be achieved. One key barrier to the successful implementation of SCM is the cost associated with the communication and coordination among members of the supply chain. However, through the advancement of three main aspects, namely technology, management paradigm, and workforce development, SCM has been proven successful in facilitating communication through the rapidly advancing information and telecommunication technologies, simplifying coordination through collaborative management techniques shared among the players, and improving the processes all along the supply chain with the skills improvement of the employees (Fredendall & Hill, 2001).

Although defining SCM has been quite a challenge for the scholars, one of the popularly accepted definition for SCM would be according to the Council of Supply Chain Management Professionals (CSCMP, 2010), where SCM is defined as:

Supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies.

SCM has been adopted in various industrial contexts as mentioned earlier. In the food industry, Mohtadi (2005) had revealed that information sharing increases the efficiency of players (retailers) because of better coordination of supplies and orders, but the level of sharing was dictated by the size of the chain, e.g. firms participating in larger chains tend to invest more in information and communication technologies in order to facilitate information sharing than the companies involved in smaller chains.

For the textile industry, Cao, Zhang, To, and Ng (n.d.) performed a survey in China which showed that companies tend to share not to share all of their information, but rather limit their information sharing to the more public information like delivery schedule, product specification, new product design and development, production schedule, and order status for tracking/tracing. Firms in the textile industry were secretive about information related to forecasting, inventory level, and sales data, which they would not disclose to other players upstream and downstream of the supply chain.

In the healthcare industry, Burns, DeGraaff, Danzon, Kimberly, Kissick, and Pauly (2002) had described the application of SCM in their industrial context and revealed that firms along the chain need to establish a portfolio approach when working with suppliers, meaning that each firm have to decide and select the players with which they want to closely work with and establish certain common ground and standards, such as by employing information technology (IT) support structures, to strengthen and enhance their relationships. This would lead to the improved management and coordination of the whole chain rather than maximising the interest of just a single player.

In the construction industry, especially in Malaysia, SCM has been considered by many as a possible solution to improving the reality of the industry (Benton & McHenry, 2009; O'Brien, Formoso,

Ruben, & London, 2010; Pryke, 2009; Oakland & Marosszeky, 2006), which is described as having problems in its structure that is particularly fragmented, leading to poor performance. In the Malaysian construction sector, the outlook did not look bright, with lacklustre financial performance that stagnated between 2000 and 2007 with a recorded average growth of 0.7%, as compared to the GDP over the same duration of 5.46% (CIDB, 2007).

As a collective initiative, the Malaysian government, through its construction arm CIDB, has produced the Construction Industry Master Plan (CIMP) Malaysia 2006-2015 (CIDB, 2007), which was formulated by the collaborative efforts of the construction industry stakeholders who were concerned about the direction the construction industry was heading. The CIMP had detailed out the key problems facing this sector, which include inefficient and ineffective methods and practices; inability to attract and develop local workforce; difficulty in securing timely and adequate financing; and inability to provide total integrated solutions.

Therefore, in order to address and solve these issues, the CIMP has identified several key strategic thrusts, and the first strategic thrust, that is related directly or indirectly to SCM, is identified as, to “integrate the construction industry value chain to enhance productivity and efficiency” (CIDB, 2007, p.94). More detailed recommendations were also drawn out, which are as follows;

1. to “consolidate the industry” by a) encouraging the partnering approach to provide total solutions through the incorporation of the partnering approach in the procurement process, and b) encourage specialisation of sub-contractors; and
2. to “standardise and integrate administrative practices and procedures” by a) standardising policies and procedures at all local authorities through the one-stop centre initiative, b) digitising the planning submission and building plan approval process, c) introducing online submission for consultants, and d) developing standardised data exchange to digitally link with technical agencies.

In order to follow the above recommendation and thus improve the industry, relationship development needs to be focused upon. This is because contrary to the conventional and adversarial form of relationships, effective SCM requires firms to seek close, long-term working relationships with partners and depend on one another for much of their business, and develop interactive relationships with partners who share information freely, who work together to solve common problems during the design of new products, who jointly plan for the future, and who make their success interdependent (Spekman, Kamauff, & Muhr, 1998; Theodorakioglou, Gotzamani, & George Tsiolvas, 2006). Theodorakioglou et al. (2006) had identified six constructs of supplier relationship development, which are supplier policy, communication/information sharing, joint action of supplier/buyer, relationship handling, supplier support, and relationship quality.

Thus, based on the literature, a model was used in this study, as shown in Figure 1.

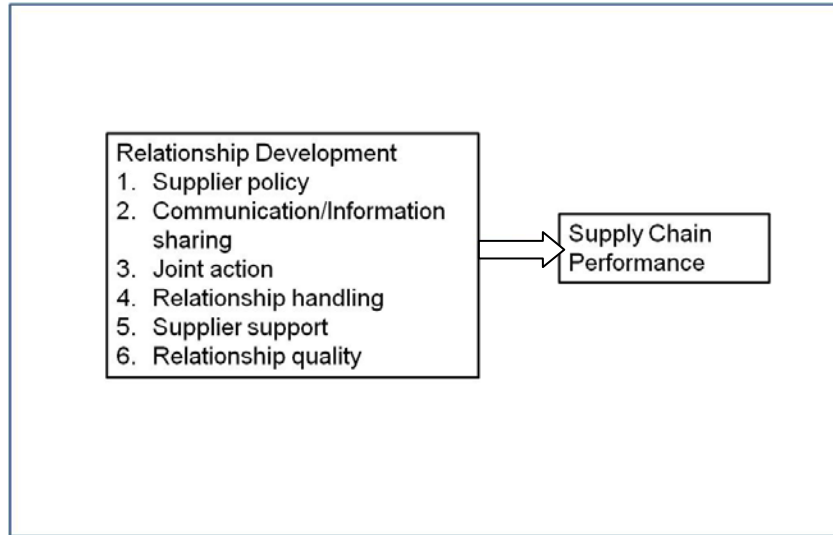


Figure 1. Model used in study

## METHODOLOGY

Since this is an exploratory study, for this research a mix-mode approach was used, which is using a combination of quantitative and qualitative approaches in order to investigate the phenomenon of relationship development in the desired construction context. This approach was adopted from Golicic, Davis, and McCarthy (2005), who advocated the balanced approach to research. Their main reason is that the body of knowledge can gain “rich data that can be gained through qualitative methods and the generation of formal theory through the quantitative approach” (p.27).

Basically, this mix-mode approach consists of two phases, which are the inductive qualitative approach and the deductive quantitative approach. During the inductive phase, a phenomenon that is detected will be explored by performing data collection, which is then described and organised in a systematic way. The output from this process, a substantive theory can be produced, ready for verification and exploration. This theory will take the researcher back to the phenomenon, and the deductive cycle will then be commenced through an in-depth literature review to obtain the formal theory. This theory can then be proved or disproved by performing field or real world verification, which leads the focus back to the phenomenon when the researcher tries to make sense of the findings and perhaps may launch another inductive cycle as new data are observed. Basically, this process is summarised in Figure 2.

Based on the CSCMP definition stated earlier and taking into consideration the construction industry context of the study, the definition used for this research was:

SCM encompasses the planning and management of all activities, processes, entities, which involve the flows of materials, finance, human resource, equipment, and information within an integrated network which consists of providers (suppliers), transformers (builders), and receivers (customers) with the objectives to improve customer satisfaction, delivery, and quality of products, and to reduce costs in the cooperative and collaborative environment.

The objective of this study was to explore the current situation of the Malaysian construction supply chain management in general, and in this paper, more specifically relationship development.

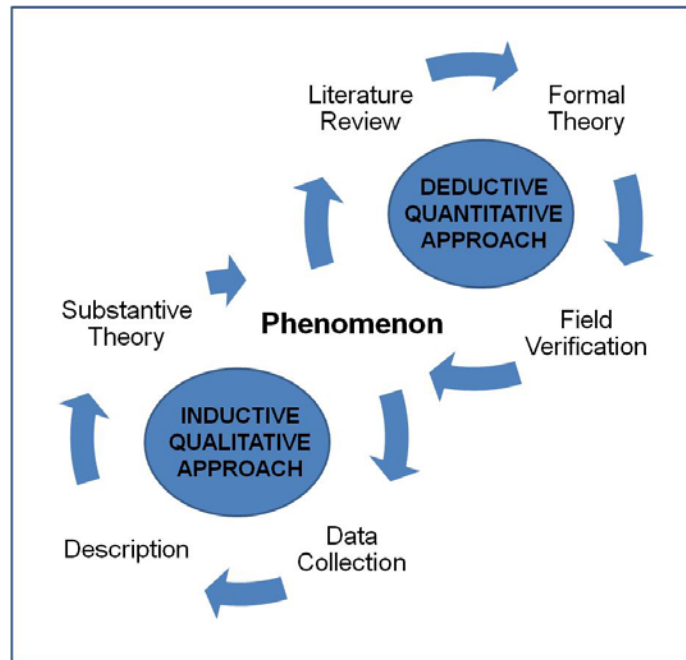


Figure 2. The balanced approach model (adapted from Golicic et al., 2005)

The scope of the research was narrowed down further to the industrialised building system (IBS) industry involved in the construction of residential buildings, and companies that were registered as between G5 and G7 companies. Therefore, the population lists were obtained from several authoritative sources. The supplier and contractor lists were obtained from CIDB and the developer list was obtained from REHDA. However, the restrictions set by the narrowing of scope cannot be applied to the developer list, since it is not feasible to determine their status individually through personal contact.

Preliminary interview sessions were performed, by using an interview protocol, at several companies to identify the problems and issues involved. A questionnaire was then developed by combining the initial findings with the literature. A pilot study was performed to refine the questionnaire as well as the interview protocol for the main round of investigation.

Thus, for the main round of investigation, a total of 300 questionnaires were sent (the minimum sample size were calculated using an online application at <http://www.raosoft.com/samplesize.html>) out to various companies via post that were randomly selected, and a total of 20 interviews were performed at the various companies. The interview sessions were recorded, where allowed, and transcribed later. For the interviews where recording was not possible, extensive note-taking was performed while the interview was performed.

Relationship development in the context of the construction industry would be the way companies deal with and manage the players upstream and downstream relative to their company in the supply chain. In the context of this research, various questions were asked in order to address and explore this issue. A total of 16 questions were presented to the respondent regarding this topic based on the preliminary interviews and previous literature, using a Likert-like scale of 1 (Low) to 4 (High). A total of 12 supply chain performance questions were also presented to the respondents, with a 1 (Low) to 4 (High) scale as well.

The resulting data was processed using NVIVO and SPSS software. NVIVO was used to organise the data according to themes and ideas, while SPSS was used to run statistical analysis, such as descriptive, reliability tests, Pearson correlation, and others.

## RESULTS AND DISCUSSION

From the number of questionnaires sent out, a total of 57 questionnaires were returned, which is a response rate of 19%, as expected of a mail survey.

To test the reliability of the questions in the questionnaire, a Cronbach's alpha reliability test was performed. Overall, the Cronbach's alpha value is 0.881, which is considered high and more than acceptable according to Nunnally's (1978) standard of 0.70. The breakdown of each item if deleted is shown in Table 2 just to confirm how much reliability is contributed by each item. From this table, it can be seen that every item did result in a great change in the alpha value if deleted (overall values are all above 0.85), thus every item was accepted for further analysis.

Table L2.  
*Results of reliability analysis*

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Cost benefits	43.72	54.149	.430	.878
Simplify construction/tendering/design processes	43.92	53.164	.604	.872
Simplify ordering process	44.08	56.879	.183	.888
Creating standardisation of process	43.97	52.999	.629	.871
Better quality service	43.56	56.254	.284	.883
Method of reaching agreement	44.00	51.886	.646	.870
Length of working relationship	43.83	52.771	.471	.877
Trust/Contractual Trust	43.64	51.609	.674	.869
Reliability of supply	43.61	55.444	.381	.880
Top management support	43.64	52.466	.591	.872
Mutual interest	43.92	51.907	.692	.869
Free flow of information	44.11	51.759	.586	.872
Joint business planning	44.28	51.406	.589	.872
Closer links between demand/supply	44.19	48.675	.720	.865
Integrated information system	44.17	49.686	.644	.869
Mutual manpower development	44.28	53.006	.383	.883

The means of each item were then calculated to give an indication of how the respondents rate each question. These means are presented in Table 3.

From Table 3, it can be observed that the respondents had ranked better quality of service (with mean value of 3.36), reliability of supply (with mean value of 3.35), and cost benefits (with mean value of

3.30) as being the top three highest ranked factors that build up the relationships with their suppliers and/or clients. This finding supports previous work by Chang (2009) with regard to the concept of mutually beneficial supplier relationships and the application of total quality management (TQM) in SCM. With regard to relationship development, it would certainly benefit both parties if the quality of service is high, the supply of material is reliable, and the cost benefits are agreeable. Therefore, this would be a “win-win” situation, as advocated by many scholars and practitioners of SCM (Benton & McHenry, 2009; O’Brien, Formoso, Ruben, & London, 2010; Pryke, 2009; Oakland & Marosszeky, 2006).

Meanwhile, the three least important factors considered by the respondents are joint business planning (with mean value of 2.63), mutual manpower development (with mean value of 2.70), and integrated information system (with mean value of 2.74). This finding perhaps goes against SCM principles (Pryke, 2009), and a possible explanation of this would be the readiness of the industry become more open and trusting in sharing their most intimate information that they may consider to be their competitive advantage. The first two items (joint business planning and mutual manpower development) would require the companies to reveal their internal workings with their partners and leave them vulnerable, while the third (integrated information system) may be too high a cost for the company to bear. This phenomenon was gleaned during interviews, as most of the companies had highlighted this fact.

Table 3.  
*Descriptive statistics of items ranked in order of means (highest to lowest)*

	Mean	Std. Deviation
Better quality service	3.36	.673
Reliability of supply	3.35	.635
Cost benefits	3.30	.735
Top management support	3.27	.700
Trust/Contractual Trust	3.24	.804
Length of working relationship	3.10	.848
Simplify construction/tendering/design processes	3.05	.688
Mutual interest	3.02	.737
Creating standardisation of process	2.93	.680
Method of reaching agreement	2.92	.702
Simplify ordering process	2.91	.839
Free flow of information	2.84	.850
Closer links between demand/supply	2.78	1.031
Integrated information system	2.74	1.021
Mutual manpower development	2.70	1.008
Joint business planning	2.63	.951

Further analysis was performed by considering the constructs provided by Theodorakioglou et al. (2006), who had identified six constructs of supplier relationship development, which are supplier policy, communication/information sharing, joint action of supplier/buyer, relationship handling, supplier support, and relationship quality. Thus, initially, the questions that were developed for these constructs totalled 16 questions, and they were aggregated into the six constructs accordingly. The performance

items were also aggregated in a similar fashion, into constructs of quality, flexibility, timeliness, and cost. Table 5 shows the descriptive results of these relationship development constructs.

Table 5.  
*Rank of identified constructs of relationship development*

	Mean	Std. Deviation
Supplier Support	3.3261	.52817
Relationship Quality	3.1667	.65828
Supplier Policy	3.0435	.55158
Relationship Handling	2.9286	.62050
Joint Action	2.7185	.87026
Communication	2.7174	.77210

From Table 5, the supplier support is ranked first among the relationship development constructs with an average of 3.33, while communication is ranked last with a mean of 2.72. This result further emphasises the trend of the Malaysian construction industry, which desires good supplier support and relationship quality, but at the same time is not ready for open and transparent communication and joint action.

Table 6 shows the Pearson correlation between the relationship development variables and supply chain performance variables. The correlation shows no significant relationship between the variables at the 1% and 5% level, thus the result is inconclusive.

Table 6.  
*Correlation between dimensions of relationship development and SC performance*

		Quality Performance	Flexibility Performance	Timeliness Performance	Cost Performance
Supplier Policy	Pearson Correlation	-.136	.103	.161	-.020
	Sig. (2-tailed)	.437	.556	.319	.911
Joint Action	Pearson Correlation	.192	.280	.089	.164
	Sig. (2-tailed)	.270	.103	.585	.331
Supplier Support	Pearson Correlation	.021	.021	.158	.020
	Sig. (2-tailed)	.905	.905	.330	.908
Relationship Quality	Pearson Correlation	-.087	-.024	.242	-.002
	Sig. (2-tailed)	.618	.889	.128	.990
Communication	Pearson Correlation	.041	.097	.068	.153
	Sig. (2-tailed)	.817	.578	.672	.374
Relationship Handling	Pearson Correlation	-.091	-.089	.194	.140
	Sig. (2-tailed)	.610	.615	.243	.431



## CONCLUSION AND RECOMMENDATIONS

From this study, it can be concluded that relationship development in supply chain management does require further investigation because of its due potential that have been observed in other settings. In the Malaysian construction industry however, supply chain management, more specifically relationship development, is still at a stage where there is plenty of room for improvement. Based on the findings, it was revealed that the players within the construction industry are still not open and trusting of their partners to the extent that they can openly share sensitive information in order to perform joint business and mutual manpower development. It was observed that the players value quality and reliability of suppliers the most, but they are not ready to invest in the information technology structure to be able to take the communication and information sharing to another level, even though it is evident in the literature that collaborative practices are required.

Additionally, this study attempted to find correlation between supply chain performance and relationship management and it was revealed that there were no significant relationships at the prescribed significance levels. This could be due to all the limitations of the research that is associated with this type of research.

Therefore, further research should continue to explore this concept in the Malaysian construction industry since there is still more knowledge to be gained through research about relationship development. The question of trust and honesty remains unexplored territory for those researchers brave enough to venture into it, since this was identified as a very sensitive area during the interviews. The population sample could be increased to include other levels of contractors. The questionnaire could be refined further, and thus perform more efficiently at collecting the data. A more rigorous method than mail survey could be employed to recover more data and get a better response rate.

## REFERENCE

- Benton, W. C., Jr., & McHenry, L. F. (2009). *Construction purchasing and supply chain management*. USA: McGraw-Hill Professional.
- Burns, L. R., DeGraaff, R. A., Danzon, P. M., Kimberly, J. R., Kissick, W. L., & Pauly, M. V. (2002). The Wharton School study of the health care value chain. In L. Burns, & W. S. Colleagues, *The health care value chain*. USA: Jossey-Bass.
- Cao, N., Zhang, Z., To, C., & Ng, R. (n.d.). *Supply chain management practice and competitive advantage in textile and apparel industries: An empirical investigation*. Retrieved December 29, 2009, from <http://www.fibre2fashion.com/industry-article/business-management-articles-reports/supply-chain-management/supply-chain-management1.asp>
- Chang, G. (2009). Total quality management in supply chain. *International Business Research*, 2(2), 82-85.
- Construction Industry Development Board (CIDB) (2007). *Construction industry master plan Malaysia 2006 - 2015*. Kuala Lumpur: CIDB.
- Council of Supply Chain Management Professionals (CSCMP) (2010). CSCMP supply chain management definitions. Retrieved April 11, 2010, from <http://cscmp.org/aboutcscmp/definitions.asp>.
- Fredendall, L. D., & Hill, E. (2001). *Basics of supply chain management*. USA: CRC Press.
- Golicic, S. L., Davis, D. F., & McCarthy, T. M. (2005). A balanced approach to research in supply chain management. In H. Kotzab, S. Seuring, M. Muller, & G. Reiner (Eds.), *Research methodologies in supply chain management*. Germany: Physica-Verlag Heidelberg.

- Mohtadi, H. (2005). The empirics of information sharing in supply chains: The case of the food industry. Working Paper 05-02, *AgEcon search – Research in agricultural and applied economics*. Retrieved August 27, 2009, from <http://purl.umn.edu/14323>
- Nunnally, J. C. (1978). *Psychometric theory (2nd ed.)*. New York, NY: McGraw-Hill.
- Oakland, J. S., & Marosszeky, M. (2006). *Total quality in the construction supply chain*. Burlington, MA: Butterworth-Heinemann.
- O'Brien, W. J., Formoso, C. T., Vrijhoef, R., & London, K. A. (Eds.) (2010). *Construction supply chain management handbook*. Boca Raton, FL: CRC Press.
- Pryke, S. (Ed.) (2009). *Construction supply chain management: Concepts and case studies*. West Sussex, UK: Wiley-Blackwell.
- Spekman, E. R., Kamauff, W. J., & Muhr, N. (1998). An empirical investigation into supply chain management: A perspective on partnerships, *International Journal of Physical Distribution and Logistics Management*, 28(8), 630-650.
- Theodorakioglou, Y., Gotzamani, K., & Tsiolvas, G. (2006). Supplier management and its relationship to buyers' quality management. *Supply Chain Management: An International Journal*, 11/2, 148-159.