

From Supplier Relations to Triad in the Automotive Industry

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Abstract— This paper presents a review of the literature of supplier relations in the automotive industry towards triad and how this has an impact on the supplier selection for buyers. This paper focuses on the automotive sector specifically. The paper suggest that triads reflect the supplier relations attributes in previous literature yet stress on the need for further emphasis on the supplier-supplier relationship.

Keywords— *Supplier relations, triad, buyer-supplier relationship, automotive*

1. Introduction

The supplier relations between the buyer and the supplier have been identified as buyer-supplier relationship in the literature. Buyer-supplier relationships have focused on the dyad relationships between the buyer and the supplier. However, research has also shown that there is now a triad: The buyer-supplier-supplier relationship. Some research suggest that buyers not only need to focus on managing its relationships with its buyers, but also need to manage the relationship between the suppliers' themselves. [1] have presented five archetypes of supplier-supplier relationships and extend their study later focusing on the supplier-supplier relationship in the triad and the role of the buyer in these relationships and how supplier performance is affected [2]. This suggest a need to extend the authors' research into the automotive industry especially looking at the supplier/vendor and how they cooperate / compete with each other as they work together to meet the requirements of the buyer. The significance of this output is that an archetype of supplier triad of the automotive industry could help both buyer and supplier understand the dynamics and help increase the

performance of suppliers of various tiers and in the end, increase the performance of the buyer.

A buyer might not realize that his supplier A, for example, are having issues with supplier B and thus supplier A could not improve its performance. Thus, by researching the triad supply dynamic, and extending it with regard to developing countries, some with a protected automotive sector, buyers could understand the supplier-supplier-buyer relationship and ensure that the systems in place are working with this dynamic rather than against. This paper presents a review of the literature of supplier relations in the automotive industry towards the triad and how this has an impact on the supplier selection for buyers, particularly for developing countries.

2. Supplier relation in the Automotive Industry

The operational performance of the firm is dependent on their suppliers, thus the buying firm needs to analyse its supply chain management and ensure that the right or strategic sourcing is in place. Strategic sourcing is defined as "...managing the supplier base in an effective manner through identifying and selecting suppliers" [3].

The automotive industry is a complex sector in which a car has 10,000 parts [4], thus the management of the supply chain is essential. When organisations outsource their activities to suppliers, the management of the supply chain has been the focus of researchers as an efficient supply chain leads to a substantial lead of competitive advantage over other competitors [5].

[6] have investigated the supply base and supply networks and the relationship of Japanese automotive companies and their suppliers in the US [7]. The buyer-supplier relationship, particularly in the automotive industry, has been shown to be either collaborative [7] or adversarial [8] or close but

adversarial [9]. Collaborative relationship has been suggested by researchers to improve suppliers' performance through direct investment by the buyer to develop the suppliers through programs such as supplier development program [10]. Thus, this suggest that to improve suppliers' performance, researchers suggest that buyers take an active interest in the development of their suppliers and build a relationship with their suppliers, either in a collaborative manner or close and adversarial.

3. Strategic sourcing and supplier selection

Building a relationship with suppliers especially for the long-term suggest selecting the 'right supplier' thus supplier selection is essential. The literature on supplier selection emphasises the importance of selecting the right suppliers [3, 11-15].

Some studies emphasised on how suppliers could be categorized into two categories based on know-how and capacity [16]. Know-how groups are suppliers with specialised knowledge that buyers depend upon. Capacity groups are when buyers use these suppliers more for capacity purposes and these suppliers are deemed less critical [16]. This suggests that suppliers' importance to the buyer is dependent on the capabilities of the supplier and what the supplier brings to the buyer-supplier relationship. [11] focused on the supplier selection criteria, while [12] extended the research through segmenting suppliers based on the needs of the buyers. [15] identified four types of relationship that buyers might have with their suppliers based on the supplier segments.

Previous study emphasised the different roles that suppliers play in supplying the needs of buyers [12]. Suppliers are divided into groups based on their importance to the buyer, either strategic, bottleneck, leverage or non-critical items. [12] also suggested the purchasing strategies related with these groups (supply versus sourcing, local versus global), as well as the length of contract (short-term versus long-term) as a way of understanding / categorising the role of suppliers. [15] extended this portfolio into the relationship between buyer and its suppliers, by suggesting four types of relationship: family, business partner, friendly and transactional. [15] used the supplier's commitment and the importance of the supplier to the buyer to build the relationship matrix. [15] proposes that various models of supplier

segmentation arise due to the marketplace environment and relationship criteria based on the buyer-supplier relationship (p.14).

[15] explains that the 'friendly' category supplier is dependent on the buyer with the buyer investing in the relationship heavily even though the supplier is less innovative. In contrast, [15] describes the 'transactional' category supplier as a relationship with less commitment from both parties, with many alternative suppliers and cost being a main differentiator.

When sourcing suppliers from overseas, including from emerging countries, criteria suggested include: innovative thinking, design-to-cost criteria and synchronizing of process between buyers and suppliers [17], quality and cost [18] and supplier selection criteria, quality assurance, as well as environmental and political issues surrounding developing countries [14]. [19] from the perspective of a developing country exporting overseas, found that technology, quality, cost, delivery and manufacturing flexibility were important criteria. In addition, in a study focusing on selecting suppliers from China, [20] suggest that developing suppliers from emerging countries needed significant investments from both buyer and supplier. [21] in their research found that for international buyers, whose suppliers are from China, issues such as formal and social control were found to be complements to each other. Similarly, for [22], control of local China suppliers by foreign buyers were enabled through detailed contracts, centralised control and relational governance. To summarise, when sourcing for suppliers, the buyer needs to understand the supplier segment relationship as well as supplier selection criteria and possible relationship investment when sourcing such suppliers from overseas.

4. Customized versus standardized product

The modular components that has emerged in the automotive sectors as well as other sectors have also brought changes to the buyer-supplier dynamic. Previously, researchers, such as [23] looked at the effects of information technology in manufacturing on supplier relationships among Japanese manufacturers. They found that when there exists two types of interface – namely, standardised (or modular architecture) and customised (integral

architecture) – five out of ten respondents would purchase customised products from a small group of suppliers. Thus for the latter types of product, the supplier relationship would be strengthened, but the reverse would occur for standardised products. As noted by Morita and Nakahara, Japanese manufacturers' cooperative relationships with their suppliers are well-known due to their long-term relationships, customised investments by suppliers and financial and personal ties. The Japanese manufacturers could purchase products from a wider group of suppliers at a more competitive price, thus reducing the need to purchase from their own small group of suppliers. Yet [23] point out that if products are customised rather than standardised, Japanese manufacturers would still procure goods from a select group of suppliers. However, as noted in the literature by [24], the Japanese automotive sector has changed due to the modular components in the industry. The automotive sector had gone through changes due to the scandal of collusion and price fixing among suppliers [25], [24] and thus supply chain management changes such as modularization, where the same parts could be used from different suppliers, ease the prospect of shifting among suppliers if necessary [26], [24].

5. Triad

A triad consists of a relationship between a buyer and two suppliers (buyer-supplier-supplier) where the buyer works with two suppliers at the same time [27]. Researchers have looked into the building of the types of the triad [1], [28] as well as the impact of the suppliers' relationship when both are suppliers to the same buyer. Triads are considered as “the smallest unit of a network” [29]. In supply network research, the triad could consist of buyer-supplier-supplier relationships and archetypes, or relationships between these actors, as well as who the actors are in a triad (buyer-supplier-supplier or buyer-buyer-supplier) as well as the supplier's role within the supply chain itself [30].

[1] have presented five archetypes of supplier-supplier relationships. These archetypes are: conflicting, contracting, dog fighting, networking and transacting. These archetypes suggest various level of ranging from collaborating supplier relations to the other spectrum of adverse supplier relations. The authors identify these as cooperative and competitive relationships between the suppliers [1]. In a triad where two suppliers have co-opetition

(both competition and cooperation) between each other as they supply to the same buyer, [27] suggest that buyers need to take into consideration that the relationship between the two suppliers are positive as this situation might have impact on the buyers' performance. Though the study was conducted in the aerospace industry, the study suggest similar situation in the automotive industry with similar manufacturing emphasis.

An issue for the buyer could be in managing the control on both suppliers, whether to have negative or positive feedback. Based on their study, the authors suggest on positive impact on feedback, thus managing the control on suppliers, not too little that there is little flexibility, but with enough balance that suppliers could be more predictable [27]. This suggest that some elements of supplier development programs could be implemented thus improving supplier performance and indirectly buyer performance [31-33].

Managing control on buyers for example through buyer control could lead to the buyer being dominant. Buyers could have either formal control or formal and social control with their suppliers [34]. Yet, in research related to triads, this situation is not necessarily so. [35] found that in a case study in a military-civil industry, a buyer and two suppliers, the dominance of one supplier could be above that of the other two players. Yet due to a long-term relationship, the buyer is willing for the dominant supplier to play the role due to mutual interdependence and harmonious relations between all players [35].

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Long-term relationships [36] in the literature on supply chain is one of the characteristics of Japanese style collaborative relations, however researchers have come to doubt on its usefulness when modular components are involved as these components could be substituted [37], [38]. [24] noted that in a white paper by Japan's METI (Ministry of Trade, Economy and Industry) in 2011 that Japanese supply chain in the manufacturing sector had acquired a

'diamond structure' where there is 'a concentration of supply links on certain key original producers of parts and materials' [24]. The impact of this action, as stated by the authors, was that if such suppliers faced disasters impacting their production, these temporary shocks could be felt throughout the network. The authors suggest that Japanese automakers could bypass intermediaries, for example, keiretsu networks and have direct contacts with suppliers, thus leading to diversification of supply networks. However, the authors caution that the new impact on this change would be quality control and safety assurance as these procedures may become more challenging especially for Japanese automakers with limited procurement departments. Yet, as noted by [39], there needs to be further research on the 'why' explanation –through looking at the buyers' and suppliers' relationship motives and history. The authors note that there is still a lack of understanding on the superiority in the parallel supplier sourcing in Toyota compared to other companies.

6. Conclusion and discussion

This paper has presented a discussion on the literature encompassing supplier relations primarily in the automotive industry towards the triad structure. The related areas of strategic sourcing and supplier selection were discussed as well as the areas of customized and modularized products also have some impact on the supplier relations. As the literature suggests, a triad structure focus more on defining in more depth the relationship between a supplier and a buyer, or in the case of a triad, two suppliers or alternatively, one supplier and two buyers. As the literature has become more focused on triad, elements of supplier relations also have an impact on the triad. Concepts of control, buyer feedback as well as supplier selection play a role in the triad architecture. The literature also accounts on the changes in the automotive or manufacturing sector as in some places such as Japan where keiretsu exists, a more direct relationship between buyer and supplier is taking place. Though the positive aspect is a more diversified supplier base, however, for cost could be to implement quality and safety control on the diversified supply base. Overall, the triad architecture suggest that the basics of the supplier relations as in the literature are relevant, yet more research seem to suggest to analyse the relationship between the two supplier actors with respect to the single buyer in a triad,

focusing on the reasons for explaining motives for relationship between suppliers and buyers.

References

- [1] Wu, Z., & Choi, T. Y. "Supplier-supplier relationships in the buyer-supplier triad: Building theories from eight case studies." *Journal of Operations Management*, Vol. 24, No. 1, pp. 27-52, 2005.
- [2] Wu, Z., Choi, T. Y., & Rungtusanatham, M. J. "Supplier-supplier relationships in buyer-supplier-supplier triads: Implications for supplier performance." *Journal of Operations Management*, Vol. 28, No. 2, pp. 115-123, 2010.
- [3] Talluri, S. & Narasimhan, R. "A methodology for strategic sourcing." *European Journal of Operational Research*, Vol. 154, pp. 236-50, 2004.
- [4] Womack, J. P., Jones, D. T., & Roos, D. "The machine that changed the world: How Lean Production revolutionized the global car wars." London: Simon and Schuster, 2007.
- [5] Bovel, D., & Martha, J. "From supply chain to value net." *Journal of Business Strategy*, Vol. 21, No. 4, pp. 24-28, 2000.
- [6] Choi, T. Y., & Krause, D. R. "The supply base and its complexity: Implications for transaction costs, risks, responsiveness, and innovation." *Journal of Operations Management*, Vol. 24, No. 5, pp. 637-652, 2006.
- [7] Choi, T. Y., & Liker, J. "Supply chain management as an emerging focus of technology management." *IEEE Transactions on Engineering Management*, Vol. 49, No. 3, pp. 198-204, 2002.
- [8] Helper, S. "How much has really changed between U.S. automakers and their suppliers?" *Sloan Management Review*, Vol. 32, pp. 15-28, 1991.
- [9] Dyer, J. H., Cho, D. S., & Chu, W. "Strategic supplier segmentation: The next 'best practice' in supply chain management." *California Management Review*, Vol. 40, No. 2, pp. 57-77, 1998.
- [10] Krause, D. R., Handfield, R. B., & Tyler, B. B. "The relationships between supplier development, commitment, social capital accumulation and performance improvement." *Journal of Operations Management*, Vol. 25, No. 2, pp. 528-545, 2007.
- [11] Dickson, G. "An analysis of vendor selection system and decisions." *Journal of Purchasing*, Vol. 2, pp. 28-41, 1966.
- [12] Kraljic, P. (1983) Purchasing must become supply management, *Harvard Business Review*, 61, pp. 109-17.

- [13] Ellram, L.M. "The supplier selection decision in strategic partnerships," International Journal of Physical Distribution and Logistics Management, Vol. 26, No. 4, pp. 8-14, 1990.
- [14] Motwani, J., Youssef, M., Kathawala, Y. & Futch, E. "Supplier selection in developing countries: a model development", Integrated Manufacturing Systems Vol. 10, pp. 154-61, 1999.
- [15] Svensson, G. "Supplier segmentation in the automotive industry", International Journal of Physical Distribution & Logistics Management, Vol. 34, No. 1, pp. 12-38, 2004.
- [16] Wagner, S.M. & Hoegl, M. "Involving suppliers in product development: Insights from R&D directors and project managers", Industrial Marketing Management, Vol. 35, No. 8, pp. 936-43, 2006.
- [17] Blenkhorn, D.L. & Noori, A.H. "What it takes to supply Japanese OEMS." Industrial Marketing Management, Vol. 19, pp. 21-30, 1990.
- [18] Min, H. & Galle, W.P. "International purchasing strategies of multinational US firms." International Journal of Purchasing and Materials Management, Vol. 27, No. 3, pp. 9-18, 1991.
- [19] Jantan, M., Ndubisi, N.O. & Hing, L.C. "Supplier selection strategy and manufacturing flexibility: Impact of quality and technology roadmaps." Asian Academy of Management Journal, Vol. 11, No. 1, pp. 19-47, 2006.
- [20] Millington, A., Eberhardt, M. and Wilkinson, B. "Supplier performance and selection in China." International Journal of Operations & Production Management, Vol. 26, No. 2, pp. 185-201, 2006.
- [21] Li, Y., Xie, E., Teo, H.H. & Peng, M.W. "Formal control and social control in domestic and international buyer-supplier relationships." Journal of Operations Management, Vol. 28 No. 4, pp. 333-344, 2010.
- [22] Zhou, K.Z. & Xu, D. "How foreign firms curtail local supplier opportunism in China: Detailed contracts, centralized control, and relational governance." Journal of International Business Studies, Vol. 43, pp. 677-692, 2012.
- [23] Morita, H. & Nakahara, H. "Impacts of the information-technology revolution on Japanese manufacturer-supplier relationships." Journal of the Japanese and International Economics, Vol. 18, No. 3, pp. 390-415, 2004.
- [24] Matous, P., & Todo, Y. "Dissolve the Keiretsu, or Die: A longitudinal study of disintermediation in the Japanese automobile manufacturing supply networks." The Research Institute of Economy, Trade and Industry, pp. 1-24, 2015.
- [25] Shirouzu, N., and M. Shiraki. "Regulators' sweep threatens auto parts business model: Japanese firms colluding to rake in huge profits with price fixing." Japan Times, 16 January 2015.
- [26] Corswant, F. v. and P. Fredriksson. "Sourcing trends in the car industry." International Journal of Operations & Production Management, Vol. 22, No. 7, pp. 741-758, 2002.
- [27] Choi, Thomas Y., Kevin J. Dooley, and Manus Rungtusanatham. "Supply networks and complex adaptive systems: control versus emergence." Journal of operations management, Vol. 19, No. 3, pp. 351-366, 2001.
- [28] Choi, T. Y., & Wu, Z. "Triads in supply networks: Theorizing buyer-supplier-supplier relationships." Journal of Supply Chain Management, Vol. 45, No. 1, pp. 8-25, 2009.
- [29] Mena, C., Humphries, A., & Choi, T. Y. "Toward a theory of multi-tier supply chain management." Journal of Supply Chain Management, Vol. 49, No. 2, pp. 58-77, 2013.
- [30] Carter, C. R., Rogers, D. S., & Choi, T. Y. "Toward the theory of the supply chain." Journal of Supply Chain Management, Vol. 51, No. 2, pp. 89-97, 2015.
- [31] Carr, AS., Kaynak, H., Hartley, J.L. & Ross, A. "Supplier dependence: impact on supplier's participation and performance." International Journal of Operations and Production Management, Vol. 28, No. 9, pp. 899-916, 2008.
- [32] Kadir, K.A., Tam, O. K., & Ali, H. "Patterns of supplier learning: Case studies in the Malaysian automotive industry." Asian Academy of Management Journal, Vol. 16, No. 1, pp. 23-42, 2011.
- [33] Giannakis, M., Doran, D., & Chen, S. "The Chinese paradigm of global supplier relationships: Social control, formal interactions and the mediating role of culture." Industrial Marketing Management, Vol. 41, No. 5, pp. 831-840, 2012.
- [34] Li, Y., Xie, E., Teo, H.H. & Peng, M.W. "Formal control and social control in domestic and international buyer-supplier relationships." Journal of Operations Management, Vol. 28, No. 4, pp. 333-344, 2010.
- [35] Weistra, J. K. W. "Coalition building on the triadic level. A case study within the military-civil industry on how coalitions are built from the perspective of a weaker buyer." (Master's thesis, Open Universiteit Nederland), 2017.
- [36] Asanuma, B. "Manufacturer-supplier relationships in Japan and the concept of

- relations-specific skill.*" Journal of the Japanese and International Economics, 3, pp. 1-30, 1989.
- [37] Hoetker, Glenn, Anand Swaminathan, and Will Mitchell. *"Modularity and the impact of buyer-supplier relationships on the survival of suppliers."* Management Science Vol. 53, No. 2, pp. 178-191, 2007.
- [38] Novak, Sharon, and Steven D. Eppinger. *"Sourcing by design: Product complexity and the supply chain."* Management science, 47(1), pp. 189-204, 2001.
- [39] Wu, Z., Choi, T. Y., & Rungtusanatham, M. J. *"Supplier-supplier relationships in buyer-supplier-supplier triads: Implications for supplier performance."* Journal of Operations Management, 28(2), pp. 115-123, 2010.