ABSTRACT

The aim of this paper is to identify factors that facilitate and inhibit supplier integration in the context of the Chinese automotive industry. An inductive approach based on grounded theory was chosen as research methodology which comprised data collection through 30 case interviews with automotive companies in China. The results indicate that buyer-side leadership is an important antecedent for building motivation, trust and commitment among suppliers and for shaping their mindsets. This in turn facilitates strategic alignment and enables suppliers to build collaborative capabilities. Collaborative capabilities, finally, proved to be a key enabler for successful supplier integration.
Keywords: supplier integration, China, automotive, collaborative relationship

Introduction

Despite the rapid growth of the Chinese automotive industry, the collaborative capabilities of domestic suppliers are still limited. In addition to lacking basic process management skills (Eberhardt, McLaren, Millington, & Wilkinson, 2004), problems can be found in a historical shortage of R&D-capabilities. In consequence, key components are still designed outside China and are imported by or sourced from global suppliers with operations in China (Holweg, Luo, & Oliver, 2005). Car makers, however, need strong partners in the Chinese automotive industry as it is virtually impossible for any firm alone to possess all the technical expertise and capabilities needed to develop and produce a complex product (Binder, 2007; Wagner, Bode, & Koziol, 2008; Wolters & Schuller, 1997).

The goal of this paper is to contribute to theory building of supplier integration in the specific context of the Chinese automotive industry by analyzing empirical data gathered from a series of exemplary cases. Thus, the paper aims at answering the following research questions: 1. How is supplier integration characterized in the Chinese automotive industry? 2. What are antecedents to supplier integration in the Chinese automotive industry? 3. What role does leadership play for supplier integration in the Chinese automotive industry?

Literature Review

Supply chain integration has been identified as an effective means to increase operational performance (Malhotra, Saeed, & Jayaram, 2008). Furthermore, the degree of vertical integration among manufacturing companies is continuously decreasing through outsourcing of business processes (Quesada, Syamil, & Doll, 2006; Tiemann, Scholz, & Thies, 2000), also in the automotive industry (Eisenbarth, 2003). This has led to an increasing dependency on suppliers (Wagner et al., 2008). Manufacturers have responded to this situation by building
more collaborative relationships with their suppliers, e.g., first-tier suppliers take on an increasing level of responsibility for developing and producing components rather than simple parts (Holweg & Frits, 2008; Petersen, Handfield, & Ragatz, 2004; Quesada et al., 2006).

A new paradigm evolved among numerous scholars that positions the purchasing function in a company into a more strategic setting emphasizing the importance of supplier management for the generation of competitive advantage (Möller & Törrönen, 2003; Narasimhan & Das, 2001; Ulaga, 2003; Watts, Kim, & Hahn, 1995). The complexity of tasks in the automotive industry calls for division of labor and strongly suggests the implementation of collaborative concepts and approaches in such a networked industry (Tang & Qian, 2007; Vonderembse, Uppal, Huang, & Dismukes, 2006). As supported by a vast amount of evidence collaborative approaches may result in improved product quality, shorter lead times and a higher responsiveness of the supply chain, lower cost and increased customer satisfaction (Bennett & O'Kane, 2006; Humphreys, Huang, Caddena, & McIvor, 2007; Tummala, Phillips, & Johnson, 2006).

Hereby, it has been found as well that order-driven supply chains strengthen the need for stronger synchronization of production planning processes (Holweg & Pil, 2007; Salvador, Forza, & Rungtusanatham, 2002). Besides collaborative production planning (Bennett & O'Kane, 2006) collaborative product development (Takeishi, 2001) can be identified as a main form of collaborative relationships.

Supplier integration and supply chain integration

This paper adheres to several existing theories relating to supply chain integration (SCI), of which supplier integration (SI) is defined as a subset belonging to the upstream part of the supply chain. SCI is defined as series of activities intended to organize the material, information and cash flow across traditional functions within companies and across
companies (Bowersox, 1999). This approach can be broken down into strategic, operational, flexible and financial aspects (Malhotra et al., 2008). Although SCI and SI has been investigated relatively extensively in the past (Bowersox, 1999; Frohlich & Westbrook, 2001; Jap, 1999; Malhotra et al., 2008; Naylor, Naim, & Berry, 1999; Stank, Keller, & Closs, 2001), specific research on SI in the automotive industry in China is scarce. Robb and Xie (2007), Pyke et al. (2000), and Zhao et al. (2007) are some examples of scholars who have elaborated SCM-related topics in China. However, supplier integration and supply chain collaboration in the automotive industry have been widely investigated not specifically in a Chinese setting in the past (Binder, 2007; Holweg & Pil, 2007; Zirpoli & Caputo, 2002) and only a few about China itself (Tang & Qian, 2007; Zhang & Chen, 2006) context.

**Methodology**

Research on supplier integration in the Chinese automotive industry is still at an early, exploratory stage, manifested by the plethora of theory-building research (Eberhardt et al., 2004; Trent & Monczka, 2003). Although there is some research on purchasing and supply management in China (Cai & Yang, 1999; Pyke et al., 2000), there is an apparent gap in the existing literature on these topics in the Chinese automotive industry. Most of the existing studies deployed a case study methodology. Therefore, an exploratory and inductive approach based on grounded theory was chosen for this study (Glaser & Strauss, 2006).

**Research Design**

The research design of this paper is based on anecdotal information gathered through talks with several dozens of purchasing, quality and supply chain professionals working in China during a time span of more than three years. As the validity and reliability of frameworks developed based on empirical studies conducted in the West cannot be taken for granted
combined with the overall lack of knowledge in this specific research context, an exploratory approach without prior assumptions or propositions was chosen. Furthermore, in order to provide a high level of accuracy and reliability of the empirical study first-hand sources were primarily used to analyze the research questions. In order to enable triangulation of the data ancillary questionnaires and archival data were also utilized (Yin, 2003).

**Sampling**

As the purpose of the research was to capture the circumstances and conditions of an everyday and commonplace situation, a so called *representative case* implying a holistic, multiple-case study approach was designed (Yin, 2003). The major rationale was to gain insight in the experiences of the average sourcing professional directly involved in the procurement of supplies in the Chinese automotive industry. As the purpose of the study was theory building, and not theory validation, a theoretical sampling approach was deployed.

As a first step, a list of automotive OEMs and first-tier suppliers with manufacturing activities in China was created. In order to account for factors that potentially influence supplier integration a number of discriminating variables were introduced. Firstly, the country of origin of the buying firm was considered because factors such as national cultures have proven to be an influencing factor on leadership effectiveness (Javidan, Dorfman, De Luque, & House, 2006), in the way negotiations are being carried out (Nassimbeni & Sartor, 2006), and how interpersonal relations are built and nurtured (Zhao et al., 2007). Secondly, as product and process requirements heavily affect the ability to procure supplies in the local supplier market (Eberhardt et al., 2004), a differentiation between *premium*, and *non-premium* automotive brands was made. Thirdly, a differentiation was also made between OEMs, first-tier and second-tier suppliers as anecdotal evidence suggests that the level of integration of
domestic suppliers varies depending on at which level an automotive firm is positioned in the supply chain. The resulting theoretical sample obtained is shown in Table 1.

Table 1. Empirical sample description.

<table>
<thead>
<tr>
<th>Company No.</th>
<th>Company Category*</th>
<th>Country of Origin</th>
<th>Revenues (USD)</th>
<th>Key Market Segment†</th>
<th>Localization Degree</th>
<th>Value share of domestic suppliers</th>
<th>Informant‡</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OEM</td>
<td>France</td>
<td>&gt; 10 bn. $</td>
<td>Non-premium</td>
<td>&gt;40 %</td>
<td>n/a</td>
<td>PM</td>
</tr>
<tr>
<td>2</td>
<td>OEM</td>
<td>Germany</td>
<td>&gt; 10 bn. $</td>
<td>Non-premium</td>
<td>&gt;60 %</td>
<td>20%</td>
<td>QM</td>
</tr>
<tr>
<td>3</td>
<td>OEM</td>
<td>Germany</td>
<td>&gt; 10 bn. $</td>
<td>Non-premium</td>
<td>&gt;60 %</td>
<td>20%</td>
<td>QM</td>
</tr>
<tr>
<td>4</td>
<td>OEM</td>
<td>Germany</td>
<td>&gt; 10 bn. $</td>
<td>Premium</td>
<td>&gt;15%</td>
<td>15%</td>
<td>QM</td>
</tr>
<tr>
<td>5</td>
<td>OEM</td>
<td>Germany</td>
<td>&gt; 10 bn. $</td>
<td>Premium</td>
<td>&gt;15%</td>
<td>15%</td>
<td>EM</td>
</tr>
<tr>
<td>6</td>
<td>OEM</td>
<td>Germany</td>
<td>&gt; 10 bn. $</td>
<td>Premium</td>
<td>&gt;40%</td>
<td>10%</td>
<td>PM</td>
</tr>
<tr>
<td>7</td>
<td>OEM</td>
<td>Germany</td>
<td>&gt; 10 bn. $</td>
<td>Premium</td>
<td>&gt;40%</td>
<td>10%</td>
<td>PM</td>
</tr>
<tr>
<td>8</td>
<td>OEM</td>
<td>USA</td>
<td>&gt; 10 bn. $</td>
<td>Non-premium</td>
<td>85-90 %</td>
<td>35%</td>
<td>PM</td>
</tr>
<tr>
<td>9</td>
<td>OEM</td>
<td>USA</td>
<td>&gt; 10 bn. $</td>
<td>Non-Premium</td>
<td>85-90 %</td>
<td>30%</td>
<td>PM</td>
</tr>
<tr>
<td>10</td>
<td>T-1</td>
<td>Austria-Canada</td>
<td>&gt; 10 bn. $</td>
<td>N/A</td>
<td>&lt;40%</td>
<td>n/a</td>
<td>GM</td>
</tr>
<tr>
<td>11</td>
<td>T-1</td>
<td>Canada</td>
<td>&gt; 10 bn. $</td>
<td>Premium</td>
<td>&lt;40%</td>
<td>20%</td>
<td>PM</td>
</tr>
<tr>
<td>12</td>
<td>T-1</td>
<td>France</td>
<td>&gt; 10 bn. $</td>
<td>N/A</td>
<td>&gt;40%</td>
<td>30%</td>
<td>PM</td>
</tr>
<tr>
<td>13</td>
<td>T-1</td>
<td>Germany</td>
<td>&gt; 100 mn. $</td>
<td>Premium</td>
<td>&gt;70%</td>
<td>50%</td>
<td>GM</td>
</tr>
<tr>
<td>14</td>
<td>T-1</td>
<td>Germany</td>
<td>&gt; 1 bn. $</td>
<td>Premium</td>
<td>&gt;50%</td>
<td>50%</td>
<td>GM</td>
</tr>
<tr>
<td>15</td>
<td>T-1</td>
<td>Germany</td>
<td>&gt; 10 bn. $</td>
<td>Premium</td>
<td>&gt;40%</td>
<td>n/a</td>
<td>PM</td>
</tr>
<tr>
<td>16</td>
<td>T-1</td>
<td>Germany</td>
<td>&gt; 10 bn. $</td>
<td>N/A</td>
<td>&gt;40%</td>
<td>n/a</td>
<td>PM</td>
</tr>
<tr>
<td>17</td>
<td>T-1</td>
<td>Germany</td>
<td>&gt; 100 mn. $</td>
<td>N/A</td>
<td>&gt;50%</td>
<td>30%</td>
<td>QM</td>
</tr>
<tr>
<td>18</td>
<td>T-1</td>
<td>Germany</td>
<td>&gt; 10 bn. $</td>
<td>Premium</td>
<td>&gt;30%</td>
<td>35%</td>
<td>GM</td>
</tr>
<tr>
<td>19</td>
<td>T-1</td>
<td>Germany</td>
<td>&gt; 1 bn. $</td>
<td>N/A</td>
<td>&gt;90%</td>
<td>20%</td>
<td>QM</td>
</tr>
<tr>
<td>20</td>
<td>T-1</td>
<td>Germany</td>
<td>&gt; 10 bn. $</td>
<td>Premium</td>
<td>&gt;40%</td>
<td>55-80%</td>
<td>PM</td>
</tr>
<tr>
<td>21</td>
<td>T-1</td>
<td>Germany</td>
<td>&gt; 1 bn. $</td>
<td>N/A</td>
<td>75-99%</td>
<td>90%</td>
<td>PM</td>
</tr>
<tr>
<td>22</td>
<td>T-1</td>
<td>USA</td>
<td>&gt; 10 bn. $</td>
<td>N/A</td>
<td>80-90%</td>
<td>80-90%</td>
<td>QM</td>
</tr>
<tr>
<td>23</td>
<td>T-1</td>
<td>USA</td>
<td>&gt; 1 bn. $</td>
<td>N/A</td>
<td>40-50%</td>
<td>n/a</td>
<td>PM</td>
</tr>
<tr>
<td>24</td>
<td>T-1</td>
<td>USA</td>
<td>&gt; 10 bn. $</td>
<td>N/A</td>
<td>70-80</td>
<td>n/a</td>
<td>QM</td>
</tr>
<tr>
<td>25</td>
<td>T-1</td>
<td>USA</td>
<td>&gt; 10 bn. $</td>
<td>N/A</td>
<td>80%</td>
<td>50%</td>
<td>QM</td>
</tr>
<tr>
<td>26</td>
<td>T-1</td>
<td>USA</td>
<td>&gt; 10 bn. $</td>
<td>N/A</td>
<td>&gt;50%</td>
<td>50%</td>
<td>PM</td>
</tr>
<tr>
<td>27</td>
<td>T-2</td>
<td>Germany</td>
<td>&gt; 1 bn. $</td>
<td>Premium</td>
<td>&gt;40%</td>
<td>5%</td>
<td>GM</td>
</tr>
<tr>
<td>28</td>
<td>T-2</td>
<td>Germany</td>
<td>&gt; 100 mn. $</td>
<td>N/A</td>
<td>100 %</td>
<td>80%</td>
<td>GM</td>
</tr>
<tr>
<td>29</td>
<td>T-2</td>
<td>Japan-Germany</td>
<td>&gt; 100 mn. $</td>
<td>Premium</td>
<td>70%</td>
<td>70%</td>
<td>PM</td>
</tr>
<tr>
<td>30</td>
<td>T-2</td>
<td>Japan-USA</td>
<td>&gt; 100 mn. $</td>
<td>Premium</td>
<td>&lt;50%</td>
<td>&gt;30%</td>
<td>PM</td>
</tr>
</tbody>
</table>

* OEM = Original Equipment Manufacturer (i.e. final assembler), T-1 = tier-one supplier, T-2 = tier-two supplier. † A differentiation between premium/non-premium suppliers is only considered applicable for suppliers that have premium customers only. ‡ PM = Purchasing Manager, QM = Quality Manager, GM = General Manager, EM = Engineering Manager.

Data Collection

Data was collected through semi-structured interviews in order to accomplish a certain degree of comparability while ensuring an unobstructed flow of narrations (Bryman, 2004). The informants involved in the study were purchasing, quality and supply chain managers from automotive companies. Each interview lasted on average two hours.

Two investigators were deployed for the interviews in order to “enhance the creative potential of the study” and to facilitate “convergent perceptions” (Eisenhardt, 1989). Furthermore, this approach also facilitated the interview procedures as one of the interviewers could focus on
leading the discussion while the second focused on taking additional notes. Each interview was conducted face-to-face, voice recorded (unless disapproved by the interviewee) and finally transcribed. In this way, a high degree of reliability and traceability of the data could be ensured (McCutcheon & Meredith, 1993). A detailed case script was sent to the respective participant for review and approval within a week after each interview (Yin, 2003). Interviews were carried out in a sequential manner until a state of information saturation was accomplished (Glaser & Strauss, 2006), resulting in a total number of 30 interviews with automotive companies, which is a reasonable number when the phenomenon of interest is clearly observable (Eisenhardt, 1989). Furthermore, in line with King’s (2004) suggestion, the interviews were kept flexible and the interview protocol was continuously modified to reflect concepts and themes that emerged spontaneously and dropping those that proved to have little relevance for the research questions.

For the sake of reliability (Marshall & Rossman, 1995; Rubin, Rubin, & Rubin, 1995), a log was kept to detail the rationale behind specific questions and all voice recordings were organized in a readily available format. Furthermore, instances of rivaling propositions were also investigated (Marshall & Rossman, 1995). Any such negative instance or rivaling proposition was questioned together with supervisors or managers in subsequent interviews. This was done in accordance with (Rubin et al., 1995) consistency principle that requires researchers to further investigate responses that appear inconsistent. In order to facilitate open communication, company representatives and company names where kept anonymous in this paper.

**Analysis and Results**

Upon completion of each interview, the voice recordings were transcribed into a text format, resulting in 650 pages of textual material. In order to assure validity, four techniques as
proposed by Maxwell (2006) were deployed. Firstly, verbatim transcripts from each interview were created which allowed multiple explanations to emerge. Secondly, discrepant cases were analyzed as to take rivaling theories into consideration. Thirdly, interview respondents were asked to give feedback on the analysis results to verify the adequacy of our findings. Finally, the results were compared to similar existing studies to further strengthen the appropriateness of concepts and causal relationships.

In line with recommendations from Hill et al. (1997) and Miles & Huberman (1984) to involve a minimum of two researchers as to cross-validate the typology of recurring themes and codes four researchers were deployed in this particular study. In this way, the reliability of identified themes and subsequent conclusions could be assured (Lee, 1999). The data was then imported into the qualitative data analysis tool QSR NVivo 7.0. A within-case analysis was conducted according to the hierarchical coding approach which involves open, axial and selective coding (Corbin & Strauss, 1990). In the open coding step, the interview transcripts were analyzed line by line breaking the data down into discrete parts (i.e. words, sentences and paragraphs) yielding 1,253 initial codes. Next, in the axial coding step, data were put back together in new ways by making connections between categories (Corbin & Strauss, 1990). Seven analytical categories and six causal relationships emerged after condensing and aggregating the initial codes. An overview of these categories and their relationships are described below (Table 2).

<table>
<thead>
<tr>
<th>No.</th>
<th>Conceptual Category</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Supplier integration</td>
<td>CC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Collaborative supplier capabilities</td>
<td>+</td>
<td>CC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Supplier collaboration readiness</td>
<td>+</td>
<td>CC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Buyer leadership</td>
<td>+</td>
<td>CC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Internal constraints</td>
<td>-(m)</td>
<td>CC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Continuous supplier development</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CC</td>
</tr>
<tr>
<td>7.</td>
<td>Cultural distance</td>
<td>-(m)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CC</td>
</tr>
</tbody>
</table>

*CC*=Conceptual category (construct), “+”= positive relationship, “-”= negative relationship, “(m)”= moderating variable.

Table 2. Occurrences of conceptual constructs and interrelations.
Supplier Integration

The first construct that emerged out of the interview analysis was supplier integration (SI). The overall concept turned out to be similar with the common definitions in literature where buyers (i.e. OEMs/first-tier suppliers) and their suppliers try to improve supply chain performance through joint activities in regard to information exchange, data transparency increase, production planning etc. (Malhotra, 2008; Zhao et al. 2007). follows a detailed description of the supplier integration concept.

Joint production planning. This is the first dimension of the SI construct and involves the planning and execution of supply-chain-wide master plans (Pibernik & Sucky, 2006). Moreover, it contains tactical and short-term activities needed in order to ensure timely delivery of direct materials for production such as the development and sharing of master production plans, or inventory levels and feedback on potential delivery delays or similar disruptions. These activities required the existence and transparency of accurate and relevant planning information within companies and synchronized exchange between supply chain echelons. It turned out in the interviews that this activity was mainly carried out manually or semi-automatically as one interviewee described:

“The production planning process in China is a rather manual process. Now that the production is running in a CKD process the planning is done by the sales department. Therefore, they determine the amount of vehicles they are going to sell and then the calculation of how many parts we need is triggered downwards. At this point in time everything is done by phone and fax so there is no EDI in place. We do have an IT system to keep track of our inventory but it is not the kind of system that we have in other plants.”
Furthermore, the level of integration of the material flow was investigated. It turned out that deliveries took place in some cases in daily, but mostly in weekly or monthly lot sizes. One purchasing manager summarized their situation as follows:

"JIT is not possible in China. Believe me! First, they don’t know. [...] We should talk about this maybe in 30 years in China. First, you have to make sure that you have the right quality and that you receive parts. Then you care about these management tools where you can really optimize processes."

It also turned out that advanced logistics and supply chain concepts, such as just-in-time (JIT) or vendor managed inventories (VMI) were possible in only a few cases. Continuous improvement processes, however, were implemented among half of the domestic suppliers.

Joint product development. This dimension of the supplier integration category proved to involve collaborative activities between the OEM and its key supplier(s) that were needed to bring new car models to the market at the lowest cost and as fast as possible (Binder, 2007). Early supplier involvement (ESI) and value analysis (VA) were major activities of this category. The actual joint product development activities proved to take place at three distinct levels, namely (1) process-related product modifications which occurred most often and refer to changes of the technical specifications due to different production processes and techniques without changing the overall product characteristics and functional requirements, (2) product-related changes in order to better adapt to the needs of local customers, e.g. elongated car bodies with more back seat leg space, and (3) new product development capability. The analysis shows that genuine joint product development activities overall took place at a very low extent; only among one of the 30 analyzed companies. In most of the cases the buyer side
took the initiatives and major responsibility for involving domestic suppliers in product
development activities

Domestic suppliers turned out to be rather reactive than proactive in this field. Interestingly, foreign automotive companies found domestic suppliers with product development capabilities comparable to international standards only in a few cases. The same purchasing manager voiced the challenge to find R&D-capable suppliers:

“R&D is the weakest point of all [Chinese] suppliers. They don’t have the capability. They only have the process design capability. Product design, no.”

For these reasons, the majority of the foreign automotive companies develops most of the core technologies of their products in their home countries or relies heavily on incumbent suppliers brought to China from overseas.

Communication technologies and patterns. This dimension of supplier integration involved the means through which communication between buyers and suppliers take place on a daily basis. The automotive companies in the West rely on a high level of electronic information exchange through the use of online supplier portals, e-sourcing tools and EDI for the information exchange between buyers and suppliers. In the Chinese automotive industry, this information exchange turned out to take place at a more basic level with frequent use of telephone, fax and e-mail as one of the interviewees stated:

“Mostly I think it’s the phone calls. Pick up the phone and give phone calls to suppliers. Talking in China is important. I also think it is e-mail. E-mail communication is another way to do that and also sometimes we use fax.”
A lack of knowledge and experience among the domestic suppliers combined with unreliable and under-performing IT infrastructures contributed to the communication patterns. Therefore, the communication technologies and IT infrastructure put in place also turned out to differ significantly compared to the West. Overall, the use of standardized communication technologies proved to be very low as explained by one respondent:

“We usually do not use the EDI kind of things, because the suppliers rarely have these technologies in place. We have invested in this kind of systems but some suppliers have an issue with investing. They want to understand the system to know if they are competent enough to use it.”

Besides from that, data exchange in terms of RFx (and corresponding responses), specifications, drawings etc., were either transferred via Internet through the File Transfer Protocol (FTP), or simply sent on a CD via conventional mail.

*Strategic Planning.* This dimension of supplier integration involved all kinds of long-term planning such as capacity, demand or product planning as well as sharing of new ideas and alignment of long objectives. Based on the analysis, the decisive factor is the maturity of the buyer-supplier relationship. Automotive companies that have done business with domestic suppliers for a long-term period also tended to involve them more often in long-term planning. However, it was evident that the stronger supply chain partner (i.e. the foreign buyer) usually dictated the activities as one interviewee explained:

“We make the decisions for the suppliers. Then, we form a task team to implement the decisions. Finally, we get a feedback from the supplier to see if we need to modify our strategic decisions.”
**Organizational Integration.** This dimension involved all kinds of joint investments (financial and non-financial) in joint infrastructure (physical and non-physical). This type of integration appears to serve as the “foundation” for other supplier integration activities. According to our results, major activities included process development and continuous improvement in order to optimize the organizational interface between the buyer and supplier. Another identified key activity was supplier development programs where cross-functional teams consisting of buyers, logistics experts, quality engineers and production managers were sent to a supplier’s facilities to improve production processes and train staff and management.

It also turned out that most buyers have some sort of contingency plans in place as part of the contract with a supplier in case unforeseen events or problems would occur. Very few companies have explicit supplier appraisal systems in place besides less explicit promises of increased business upon expected performance standards. One interviewee summarized it as follows:

“To do business with us, I want the supplier to be very excited about it […] firstly, they experience business growth which brings even more customers. Secondly, you get a very reasonable profit. […] For non-performers, we just let the program die.”

In sum, it can be concluded that most buyers take a cooperative stance towards their key suppliers. Nevertheless, there is a great deal of adversarial behavior where information asymmetry plays an important role rendering full openness very difficult. This is reflected in the low degree of open book policies in place.
Collaborative Supplier Capabilities

After examining the concept of supplier integration in the Chinese automotive industry, interviews were asked to elaborate on factors that facilitate and drive supplier integration in the Chinese automotive industry. It appeared that the key driver behind the extent to which SI can take place hinges on a set of supplier capabilities that enables interaction and collaboration between the buyer and the supplier. The collaborative supplier capabilities pinpointed as most critical for facilitating supplier integration were process and performance management capabilities, communication and autonomous problem solving capabilities, planning capability as well as engineering and innovation capabilities.

Process management capability. The first dimension of collaborative supplier capabilities that emerged from our data was process management capability. It appeared to be one of the most important ones as most respondents claimed that it enables producers to effectively achieve adequate quality, delivery, productivity, and at the end also cost levels. According to the respondents, this capability has to be shown in basically any activity of the supply, development, production, and delivery process. Consequently, reliable and stable processes seem to be a prerequisite for supplier integration in the automotive industry. As a purchasing manager of a European first-tier supplier stated:

“You get the best costs and the best quality from a stable process. It doesn’t matter whether it is a management, business, or manufacturing process.”

Performance management capability. Another common SI driver highlighted in twelve cases was the frequent difficulty of managing production and delivery performance (Kaplan & Norton, 1992). Despite a high willingness to learn (indicated in 8 cases) and to invest in improvement activities the experience was that a lack of targets, performance indicators and
action plans, lead to instable results and gradually drifts away from pre-defined levels. Other stated reasons for this phenomenon were high staff turnover rates, a lack of organizational learning and broken information feedback loops within the Chinese companies.

*Communication/Autonomous problem solving capability.* One of the most frequently occurring challenges concerning supplier integration in the Chinese automotive industry (22/30 cases) was the difficulty in effectively communicating with suppliers. This was the case especially concerning problem identification where most suppliers were described to be very reactive. Twenty-one of the 30 cases indicated this capability to be of essential importance further stressing this inhibiting factor for supplier integration. In general, this problem led to situations where buyers had to spend considerable resources on supplier monitoring and inspection on a continuous basis in order to discover potential problems at an early stage. As one Chinese purchasing manager stated:

“Social harmony many times takes precedence over rational thought so that problems are rather wiped under the carpet instead of quickly communicated.”

Linking this dimension with the Chinese culture, it is plausible that this is a mechanism to avoid potential face loss for the supplier (Faure & Fang, 2007; Ramasamy, Goh, & Yeung, 2005). Nevertheless, this behavior only delays rather than avoids the inevitable necessary problem-solving efforts.

*Planning capability.* Partly interlinked with the process management capability, the planning capability within a company and across companies was named as a prerequisite to manage processes across the supply chain in a reliable and stable manner (indicated 15/30 cases). Many of the suppliers were said to lack experience in collaborative production and development activities, as exemplified by one interviewee:
“Planning is paramount. You can’t delay. Here [in China], project plans with milestones are often missing and have to be set up with the help from us. Why that? You developed a program, a car, based on the market needs. If you delay it for two years you can basically scrap it.”

Evidently, accurate and relevant planning information regarding orders, inventories, capacities etc. were often reported to be missing. In most cases, missing information systems or the lack of a systematic approach were suggested as possible reasons for this situation even though the general willingness to share planning information was confirmed among the majority of the cases.

*Engineering/Innovation capability.* This capability was emphasized as one of the key drivers for strategic partnerships with suppliers in 21 of the cases. Despite a high degree of openness and willingness to learn and develop the level of innovations stemming from domestic suppliers still proved to be very low. The research results did not reveal a single case where genuine product development took place. The few instances where joint R&D activities happened turned out to be limited to product modifications primarily on the initiative and guidance of the buyer. A purchasing manager from a foreign OEM captured the common practice with the following statement:

“The question is was it “real” R&D or was it design-to-specifications. We did joint testing, of course. As you might know you have to test aluminum rims very thoroughly. So, this is a joint development work if you want to call it like that but obviously we are not engaging here into new technologies. It is not what we have done. The wheel has not been re-invented so to speak.”
As most of the interviewees indicated the ability to develop a component on the basis of functional requirements as a prerequisite for supplier integration the level of difficulty is apparent. A breakthrough innovation capability in line with Möller and Törrönnten (2003) where the supplier proves to be a proactive leader of new product and process innovations was not observed in any of the cases.

With the above discussion in mind it is clear that successful supplier integration in the Chinese automotive industry requires a certain set of capabilities. This leads therefore to the following proposition:

\[ P1. \text{ The aggregate level of collaborative supplier capabilities has a positive impact on supplier integration.} \]

Supplier Collaboration Readiness

Following the discussion about the importance and impact from collaborative supplier capabilities on supplier integration, the next question is indeed how such supplier capabilities can be developed and maintained. Thus, we asked the interview respondents to elaborate on features of suppliers with whom collaborative activities were successfully established. Our data analysis revealed the following dimensions.

Quality Mindset/Customer orientation. In instances where successful buyer-supplier interaction had taken place it was evident that a quality mindset permeated the supplier organization from top to bottom. Examples of such values and beliefs were a perceived importance of quality, zero tolerance for defects, paying attention to details in operations, continuous improvement and an acknowledged importance of the customer. One interviewee explained it this way:
“In our business quality is key. If we fail to deliver high quality we’re out. Quality can never be compromised. Our challenge is to convince our suppliers to pay attention to details and focus on the end customer. The Chinese saying ’cha bu duo’ [Chinese for ‘close enough is good enough’] simply doesn’t apply to the premium automotive industry.”

*Top management support.* According to the data it seems difficult to build and nurture the same kind of thinking throughout the organization unless supported by senior management. Collectively, these values and beliefs can be summarized as top management mindset.

“To a certain degree, they [senior managers] will listen to you. And facing the immediate benefit they will do it. On a long term you really have to change the mindset of the top management of the supplier. [...] It depends, some of them you can change. And any change [within Chinese automotive suppliers] has to come down from the top.”

*Strategic alignment.* The results also showed that those suppliers that were involved in successful collaborative projects with their customers were also highly motivated. This motivation was manifested in several ways. First, highly motivated suppliers turned out to have a high willingness to follow – that is, they seemed to have realized the benefits of making necessary changes and adaptations to their strategy, processes and organization in order to make their customer relationships work. These suppliers, in particular their senior managers, seem to have decided that the customer relationship was beneficial to their companies and hence aligned their companies’ operations accordingly.
“In terms of a long term relationship strategic alignment is important. [...] We have common goals. We start to define the objectives and requirements and give them to the supplier. So, there is a necessity for the supplier to be able to match these requirements.”

*Willingness to learn/improve.* In parallel with the strategic orientation among successful collaborative supplier-buyer relationships those suppliers also showed a great interest in learning and improving. The willingness to learn and improve also seemed to be coupled with the supplier mindset in a sense that suppliers must have acknowledged the need for improving performance in order to invest time and money in training and improvement activities. One of the interviewees went as far as saying:

“The supplier relationship will only last as long as the supplier can learn something from it.”

This phenomenon imposes a requirement on the buying organization to provide support in training, technology transfer and communication of visions.

*Long-term orientation.* Product development in the automotive industry is a costly and lengthy process. Thus, it is no surprise that well integrated suppliers had adopted a long-term view where expenses today were perceived as investments in future benefits as one respondent pinpoints:

“First of all, it is important that the supplier has a product which is important for us in the future. [...] Secondly, it is important that the supplier is willing to invest and follow us in different regions where we have business.”
This factor proved to be one of the more common problems when dealing with domestic suppliers in China. They often tend to prioritize short-term profit over long-term objectives such as overseas expansion, technology leadership, excellent customer service and quality excellence.

**Trust.** In buyer-supplier relations characterized by a high degree of supplier integration the data shows that a high level of trust from the supplier’s side was prevalent. In contrast, in those instances where the level of trust was low suppliers were not willing to take the financial risk implied from engaging in new automotive development projects, investments in new equipment/machinery and staff training activities.

“Managing supplier relationships is really about trust. Then you can talk about things. This is the ideal situation. [...] Some suppliers are faster, for some suppliers it takes longer, for some it will never happen.”

The elements identified above might be aggregated to a conceptual construct called **supplier collaboration readiness**. They represent the “bricks and mortar” needed to build collaborative supplier capabilities. Without top management support, willingness to learn and improve, the right strategic orientation and a trust in a non-opportunistic relationship it is not possible to develop and maintain the required supplier capabilities necessary for successful supplier integration. The second proposition is therefore defined as follows:

**P2. Supplier collaboration readiness has a positive impact on the level of collaborative supplier capabilities.**
Buyer Leadership

Another aspect that emerged out of the coding of the transcribed interviews was the role of leadership. Most recent leadership research has primarily focused on “influencing a group of people to achieve a common goal” within one’s own organization (Northouse, 1997, p. 3) by virtue of formal power and authority (French & Raven, 1959). The data analysis of this study indicates that leadership might in fact also span across firm boundaries.

At an aggregate level, a number of traits could be identified among the interviewed leaders involved in collaborative projects. First, they appeared to have a positive attitude towards their work in general. Second, they showed a strong belief that they indeed were able to influence their suppliers and “make them follow”. Third, they also seemed to highly enjoy “doing business in China” characterized by a high degree of overlap between work and leisure time, e.g. social events such as dinners and sports. Fourth, most interviewees who led such initiatives also had a positive attitude towards their work despite frequent statements about a need to work simultaneously at both a strategic and operational level.

The empirical data also suggests that there exists a set of behaviors related to leadership. The relevant aspect in our study proved to be the leadership behaviors towards the supplier organizations. Almost all decision makers from buying organizations involved in collaborative supplier activities tended to apply a sort of situational leadership style (Hersey & Blanchard, 1969) depending on the relationship atmosphere and urgency of the matter:

“I believe I am quite cooperative and coaching in the beginning and as long as the supplier lives up to our expectations. […] But if there is a problem, I usually get rather assertive. You have no other choice. […] You need a carrot to motivate and a stick to implement.”
It turned out that leaders who allegedly had managed to facilitate a high degree of collaborative readiness among the suppliers had taken a systematic approach. They did not only focus their efforts on one function but rather targeted the senior management among their suppliers and actively worked at a very personal level to convince these managers to adopt values, beliefs, make strategic adaptations, investments in new machinery/equipment etc. in line with the strategic orientation of their own company.

In sum, it can be said that the local supply leaders serve as the “organizational interface” between the domestic suppliers and the internal customers located outside of China. Thus, the third proposition is defined as follows:

\[ P3. \text{Buyer leadership effectiveness has a positive impact on supplier readiness.} \]

**Continuous Supplier Development**

Another construct that emerged during the axial coding of the interview data turned out to be continuous supplier development. Conceptually, the construct involves activities from organizing relevant training for the supplier at various levels (e.g. FMEA, APQP, TQM etc.) to consulting activities at the supplier’s facilities.

The fact that supplier development is a common and acknowledged practice in the automotive industry is no news. However, the results indicate a more idiosyncratic side of the concept. In fact, it seems that supplier development activities must take place on a continuous basis. Most respondents agreed that it was seldom enough to invest once into some supplier development activities for a specific supplier. In many of the cases supplier performance started to become volatile and drift away from target levels as soon as supplier development activities were stopped. A purchasing manager expressed the phenomenon as follows:
”I think that the challenge with the domestic suppliers is that when there is a lot of pressure from customers then it works. But once the pressure is taken away, especially domestic suppliers don’t have a system that can guarantee continuity in processes to meet [the required] quality“

The fourth proposition is thus defined as follows:

P4. The level of continuous supplier development has a positive impact on the level of collaborative supplier capabilities.

Internal Constraints
The data coding also revealed that the challenges concerning supplier integration in the Chinese automotive industry are not only related to the domestic suppliers. Or as one of the interviewees said:

“Managing headquarters expectations is many times more difficult than managing Chinese suppliers.”

In fact, many cases indicated that some of the biggest bottlenecks were related to internal issues. One of the most prevalent internal challenges was identified as unrealistic headquarters expectations. This was manifested as an outspoken frustration over under-achievement both among the local supply managers as well as the managers at the headquarters. Large buying organizations also seem to have a harder time adapting to local conditions:
“Big companies have many rules and must have many rules and regulations; otherwise you cannot run a big company worldwide. So, you can have one, two year extension for your contract, but sometimes some markets also need to have adapted rules. Big companies very often forget the whole world is not a headquarters. Even if it should be run like this you also need to pay attention to special characteristics [of the local markets].”

Finally, it also turned out that the higher the quality requirements, the higher difficulty to achieve supplier collaboration readiness. The problems were exacerbated in those instances where the product mix was high and where purchase volumes were relatively low. The explanation for this fact is simply that the “capability gap” between the buyer and the supplier increases as complexity increases due to more stringent requirements. This was highlighted by a purchasing manager from a European OEM:

“In contrast to many of our competitors, we use the same specifications for China as elsewhere – we do not compromise. Furthermore, our product mix is high and our production volumes are low which makes us a less attractive customer from the supplier’s point of view. […] We strive for perfection, and considering our requirements, some parts are almost over-engineered for the Chinese market.”

Based on the above discussion, the fifth proposition is defined as follows:

\[ P5. \text{The level of internal constraints is negatively moderating the relationship between buyer leadership effectiveness and supplier readiness.} \]
Cultural Distance

This study does not deliberately investigate the impact from specific cultural characteristics such as power distance, masculinity, uncertainty avoidance, individualism etc. (e.g. Hofstede (1980); Javidan et al. (2006). Instead, it investigates manifestations of culture by specifically considering discrepancies and idiosyncrasies in terms of values, beliefs and behavior at a national level between China and the West.

The axial coding results suggest that the importance of culture for successful supplier integration play a somewhat ambiguous role. On the one hand, some respondents claimed that there are no cultural differences and that culture has no impact – it is business as usual no matter where you are. On the other hand, some respondents claimed that cultural difference between China and the West are significantly and severely limiting the chance for success. Regardless of any conceptual culture frameworks elaborated in the literature, cultural distance is almost always manifested in differences in interpersonal communication as one interviewee expressed:

“During the meeting the Chinese will not tell you “no” but for our westerners an ok means ok. I’ve learned big lessons myself. This is a problem. Another problem is that I have made time plans but, they [the suppliers] cannot to tell you if they will be able to meet your time plan. They don’t know how long it will take them to make a logo - and if they don’t know they don’t tell you. […] We have to ask “are you sure you can do it?” If you say you can do it, show me the plan. You need to get into this kind of detail to get information out of them.”

Clearly, the coding revealed culture to be an influencing factor. It turned out that cultural differences and a lack of cultural understanding in many cases hinder supply managers from
effectively doing their job because it makes actions and counter-actions of the supplier more
difficult to anticipate. It is also more difficult to provide adequate stimuli and value
propositions for suppliers due to the inherent cultural gap. Therefore, the sixth proposition is
stated as follows:

\[ P6. \text{The level of cultural distance is negatively moderating the relationship between buyer leadership effectiveness and supplier readiness.} \]

Collectively, the six propositions form a causal framework identifying important antecedents to supplier integration in the Chinese automotive industry. An overview of the conceptual framework is depicted in Figure 1.

\textbf{Conclusions}

So far, most research in the field has focused on supplier integration in a Western context. As China is becoming a major automotive market in the world this study is deemed to be of interest for both academics as well as practitioners from various fields.
**Theoretical Contribution**

The developed conceptual framework is based on an extensive analysis of recent and current supplier integration practices in the Chinese automotive industry. The elements identified through the interviews and their direct and indirect linkages provide a solid ground for further research and adds to the theory development in this specific area (Frohlich & Westbrook, 2001; Malhotra et al., 2008). The study results contribute specifically by adding a specific perspective on supplier integration analyzing the antecedents of supplier integration in the Chinese automotive industry. Elements such as buyer leadership effectiveness might not be as relevant in a Western context but seem to be of importance in this specific context. Furthermore, a so called ‘leader’ in this context does not seem to be limited to formal leaders; the data analysis in fact suggests that leadership seemed to exist at all hierarchical levels and all functions involved in the collaborative activities from the buyer’s side. Hence, although formal responsibilities and a highest point of authority were often in place, leadership did not seem to primarily hinge on individuals in the organization but rather on the aggregated leadership activities of individuals involved which could be finally described as some organizational leadership from the buyer. The results of the study contribute to a better understanding which elements might be necessary in a Chinese context to achieve a satisfactory level of supplier integration.
**Managerial Implications**

Chinese suppliers are gradually shifting from the production of basic parts and components to higher value-added production strategies including modules and systems in order to become globally successful. This in turn necessitates improved process skills and innovation capabilities (Hult, Ketchen, & Chabowski, 2007). Successful buyer-supplier integration is thus a key element for both OEMs and Chinese suppliers to become successful in China and other markets. Besides classic performance measurement criteria such as cost, quality, delivery and flexibility, more attention has to be paid to ‘softer’ criteria such as innovation development potential, top management support, process/quality/SCM mindset, collaborative and organizational learning abilities, as well as a level of trust between buyers and suppliers in order to integrate OEMs and their Chinese suppliers at the required performance level. As a consequence, the concept of supplier readiness and continued supplier development activities might be of high relevance.

**References**


