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May 5, 2015

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Executive Summary

- This study assembles, verifies, and refines a catalog of supplier development (SD) activities, and 2) examines the role of knowledge management in supplier development.
- This survey was sent to 135 scholars, each of whom published at least an empirical study on supplier development between 1996 and 2015. Thirty percent of them responded to this survey.
- Overall, the average degree of inclusion for 30 activities in the catalog is 3.71 (1-not at all, 3-moderately, 5-extremely), significantly higher than 3, indicating that the scholars regard most activities in the catalog as supplier development activities.
- Scholars regard Supplier Training, Technical Assistance, and Managerial Assistance, as the top three supplier development activities.
- Direct supplier development activities such as Supplier Training and Financial Support have higher degrees of inclusion than indirect ones such as Supplier Evaluation and Competitive Pressure.
- Precision for twenty-four of thirty descriptions are significantly higher than 3, indicating a majority of activities are described in an accurate and complete manner.
- Twenty-eight of thirty activities received at least one comment from scholars and those comments will help further improve the catalog of SD activities and their descriptions.
- An overwhelming majority of SD Scholars (over 95%) indicate that knowledge sharing is at least very important for supplier development.
- Scholars think that in order to achieve desired outcomes of supplier development, both buyer and supplier should at least moderately conduct five first-order (i.e., acquisition, selection, generation, assimilation, and emission) and four second-order (i.e., measurement, leadership, coordination, and control) knowledge management activities in supplier development.
- For buyers, knowledge selection, assimilation, and coordination are significantly higher than 4 (p<0.05); for suppliers, knowledge assimilation is significantly higher than 4 (p<0.05).
- All five first-order KM activities should be conducted by both buyer and supplier to similar degrees (p-values ranging from 0.11 to 1.00), but buyers should conduct second-order KM activities to a higher degree than suppliers (p-values ranging from 0.00 to 0.02).
Research Purpose and Process

Our previous research has identified over 500 supplier development (SD) activities appearing in about 100 empirical articles dealing with SD. These activities are condensed and classified into 30 types, which are named and defined based on the articles’ characterizations (see Table 1). The result is a comprehensive catalog of SD activities. Further analysis of this catalog reveals that SD relies heavily on performance of knowledge management activities. As a follow-up study, this research collects perceptions from experienced SD scholars to 1) verify and improve the catalog of SD activities, and 2) examine the role of knowledge management in supplier development.

First, 171 SD scholars were identified from 107 journal articles and four dissertations, which were published between 1996 and 2015 and which consider supplier development as their emphasis. However, 26 scholars were dropped because their contact information is unavailable online. Accordingly, 145 scholars entered the finalist of SD scholars. Among them, 49 are from United States, 24 from United Kingdom, 14 from the Greater China Region (6 from Hong Kong, 5 from Taiwan, and 3 from Mainland China), 9 from Germany, and 8 from Canada and Netherlands, respectively. Among them, six scholars (Daniel R. Krause, 12; Stephan M. Wagner, 7; Paul Humphreys, 6; Thomas V. Scannell, Wen-Li Li, 5; and Cristobal Sanchez-Rodriguez, 4) have published more than three articles.

An invitation email, along with an electronic survey and cover letter, which were approved by the IRB office at the University of Kentucky, was sent to them. After three weeks, a follow-up email was sent to those who had not responded. Two weeks later, a final reminder was sent. Among 145 researchers, four were undeliverable and eleven responded to indicate their unavailability due to various reasons, such as retirement and no interest. Among the remaining 130 potential respondents, 39 respond to the SD scholar survey (response rate=30%).
This survey includes two sections: Section I Summary of Supplier Development Activities and Section II Knowledge Sharing & Management in Supplier Development. Among the 39 participants, 22 and 33 have completed Section I and Section II, respectively.

**Research Findings**

1. **A Catalog of Supplier Development Activities**

   **Description of SD Activities**

   SD scholars are invited to evaluate how precise each activity’s description is. Overall, SD scholars think the description of all 30 SD activities is at least moderately precise. The mean value of 30 activities’ description ranges from 2.73 to 4.43, with an average of 3.86, which is significantly higher than 3 (p=.000). In addition, 24 of 30 descriptions are significantly higher than 3, indicating that the group of SD scholars regards a large majority of activities as being described in a precise manner. Furthermore, 13 activity’s descriptions are higher than 4, among which the description of Financial Support is significantly higher than 4 (p=.009).

   SD scholars showed a high interest in this catalog, and they commented on 28 of the 30 SD activities. Among them, Supplier Evaluation (ID: 01), Performance Expectation (04), Supplier Certification (05), Competitive Pressure (06), Trust Building (10), Quality Assurance (11), Supply Base Rationalization (14), Information Sharing (21), and Joint Action (29) received at least four comments. In later research, these comments will help to further improve the catalog of SD activities and their descriptions.
## Table 1: To What Degree the Activity’s Description Is Regarded as Being Precise

(1-not at all, 3-moderately, 5-extremely)

<table>
<thead>
<tr>
<th>Activity &amp; Description</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. Financial Support: Providing supplier with capital for new investments or direct investment</td>
<td>4.43**</td>
<td>0.676</td>
</tr>
<tr>
<td>19. Technical Assistance: Providing supplier with technical support/assistant or solving supplier’s technical problems</td>
<td>4.27*</td>
<td>0.985</td>
</tr>
<tr>
<td>07. Quality Emphasis in Supplier Selection: Selecting suppliers according to quality first</td>
<td>4.24*</td>
<td>0.944</td>
</tr>
<tr>
<td>04. Supplier rating: Ranking supplier’s performance through a rating system</td>
<td>4.23*</td>
<td>1.110</td>
</tr>
<tr>
<td>22. Evaluation Feedback: Providing feedback about evaluation results and highlighting supplier’s problem</td>
<td>4.18*</td>
<td>1.006</td>
</tr>
<tr>
<td>17. Physical Asset Support: Providing supplier with equipment, tools or/and new production line</td>
<td>4.14*</td>
<td>0.910</td>
</tr>
<tr>
<td>26. Supplier Visit: Inviting suppliers’ personnel to visit buyer's site</td>
<td>4.14*</td>
<td>0.834</td>
</tr>
<tr>
<td>18. Supplier Training: Providing training or education to supplier’s personnel in any area</td>
<td>4.14*</td>
<td>0.990</td>
</tr>
<tr>
<td>27. Co-Location: Assigning support personnel to the supplier’s facilities, or guest engineers</td>
<td>4.14*</td>
<td>0.889</td>
</tr>
<tr>
<td>20. Managerial Assistance: Providing supplier with support/assistant in quality management, inventory management, etc.</td>
<td>4.09*</td>
<td>1.065</td>
</tr>
<tr>
<td>28. Employee Exchange: Employee rotation, transfer, or exchange between buyer and supplier</td>
<td>4.09*</td>
<td>0.971</td>
</tr>
<tr>
<td>25. Plant Visit: Regularly visiting supplier’s plant/site</td>
<td>4.05*</td>
<td>0.921</td>
</tr>
<tr>
<td>24. Dynamic communication: Communication/interaction/contact with supplier’s personnel, including two-way, face-to-face, open forms</td>
<td>3.95*</td>
<td>0.999</td>
</tr>
<tr>
<td>03. Performance Expectation: Increasing or setting supplier performance goals</td>
<td>3.91*</td>
<td>1.151</td>
</tr>
<tr>
<td>09. Clear Specification: Providing supplier with clear specific product/technical specification</td>
<td>3.91*</td>
<td>1.151</td>
</tr>
<tr>
<td>11. Quality Assurance: Assurance of supplier quality or conducting supplier auditing</td>
<td>3.91*</td>
<td>0.921</td>
</tr>
<tr>
<td>05. Supplier Certification: Using a certification program to certify supplier’s quality</td>
<td>3.86*</td>
<td>0.774</td>
</tr>
<tr>
<td>13. Supply base reduction: Reducing/Narrowing down the number of suppliers</td>
<td>3.86*</td>
<td>1.246</td>
</tr>
<tr>
<td>30. Buyer’s Involvement: Buyer’s involvement in supplier’s business, e.g. process improvements, planning and goal-setting activities, etc.</td>
<td>3.82*</td>
<td>1.006</td>
</tr>
<tr>
<td>02. Direct Incentive: Recognizing supplier’s achievements/performance in the form of awards</td>
<td>3.77*</td>
<td>1.152</td>
</tr>
<tr>
<td>08. Promise of Business: Promise of current or future benefits/business, or extension of long-term contracts to suppliers</td>
<td>3.77*</td>
<td>1.152</td>
</tr>
<tr>
<td>15. Community of Suppliers: A network of suppliers aiming at facilitating learning/information sharing networks among suppliers</td>
<td>3.68*</td>
<td>1.129</td>
</tr>
<tr>
<td>12. Supplier Council: Comprised of a group of executives from strategic suppliers who meet regularly and collaborate on certain initiatives</td>
<td>3.64*</td>
<td>1.177</td>
</tr>
<tr>
<td>01. Supplier Evaluation: Evaluating supplier’s performance in formal or informal process</td>
<td>3.50</td>
<td>1.225</td>
</tr>
<tr>
<td>21. Information Sharing: Sharing/exchanging all kinds of information (e.g. product, quality, product process, volumes, price development, and market conditions) to help suppliers</td>
<td>3.50</td>
<td>1.185</td>
</tr>
<tr>
<td>10. Trust Building: Building mutual trust/credibility with supplier</td>
<td>3.45</td>
<td>1.262</td>
</tr>
<tr>
<td>29. Joint Action: Collaboration, cooperation, or working with suppliers in any areas</td>
<td>3.32</td>
<td>1.249</td>
</tr>
<tr>
<td>06. Competitive Pressure: introducing new suppliers or using multiple suppliers for purchased some items to create pressure among suppliers</td>
<td>2.95</td>
<td>1.397</td>
</tr>
<tr>
<td>14. Supply Base Rationalization: Supply base rationalization or integration to meet buyer’s needs</td>
<td>2.73</td>
<td>1.316</td>
</tr>
</tbody>
</table>

** denotes significantly higher than 4 at p<0.05; * denotes significantly higher than 3 (moderately) at p<0.05;
Catalog Verification

Across all 30 activities, the average of the degree to which each is regarded as being an SD activity is 3.71, significantly higher than 3, indicating that the activities in this catalog are, overall, regarded as SD activities. Interestingly, direct SD activities such as Supplier Training and Financial Support have higher SD degrees than indirect ones such as Supplier Evaluation and Competitive Pressure.

Among the 30 activities, 19 are significantly higher than 3 (moderate). Supplier Training (ID: 18), Technical Assistance (19), and Managerial Assistance (20) are significantly higher than 4 (high). In addition, these three activities have the smallest standard deviations, indicating that most scholars consistently regard these three activities as being SD activities.

From the scholars’ perspectives, those activities with lower scores are evoke some doubt about whether they should/can be regarded as SD, because either they are not seen as developing a supplier (e.g., Competitive Pressure), or they are seen as prerequisites to SD (e.g., Trust Building).

Figure 1: To What Degree This Activity Is Regarded As Being A SD Activity
2. Knowledge Sharing in Supplier Development

Over 45% of SD scholars think knowledge sharing is extremely important for supplier development. An overwhelming majority of SD Scholars (over 95%) indicate that knowledge sharing is at least very important for supplier development (see Figure 2). Some typical knowledge sharing activities in supplier development include (Wagner and Krause, 2009):

- Giving manufacturing-related advice to this supplier (e.g., processes, machining process, machine set up)
- Giving technological advice to this supplier (e.g., software, materials)
- Giving product-development-related advice to this supplier (e.g., processes, project management)
- Giving quality-related advice to this supplier (e.g., use of inspection equipment, quality assurance procedures)

![Figure 2: The Importance of Knowledge Sharing for Supplier Development](chart_image)
3. Knowledge Management Activities in Supplier Development

Knowledge Chain Theory

Knowledge Chain Theory (Holsapple and Singh, 2001) identifies and characterizes five classes of first-order knowledge management (KM) activities that organizations perform. These involve manipulation of knowledge resources. There are also four classes of second-order KM activities that capture managerial factors influencing and governing the conduct of those manipulation activities (Holsapple and Singh, 2001; Holsapple and Jones, 2004, 2005).

As presented in Figure 3, the five classes of first-order KM activities are acquisition, selection, generation, assimilation, and emission. The four classes of second-order KM activities are measurement, control, coordination, and leadership. In total, the nine distinct, generic classes of activities are available for an organization to perform in the course of managing its knowledge resources in an effort to attain better performance or competitive advantage. Empirical study of the Knowledge Chain Theory has found that any of the nine KM activities can be performed in ways that enhance competitiveness (Holsapple and Wu, 2011).

![Figure 3: Knowledge Chain Theory](image)
To What Degree Each KM Activity Should Be Conducted In SD

The SD scholars rate all of the five first-order KM activities as significantly higher than 3 for both buyer and supplier (see Figure 4), indicating that in order to achieve desired outcomes of supplier development, both buyer and supplier should conduct all five first-order KM activities to at least a moderate extent.

Similarly, SD scholars rate all four second-order KM activities as being significantly higher than 3 for both buyer and supplier (see Figure 5), indicating that in order to achieve desired outcomes of supplier development, both buyer and supplier should conduct all four second-order KM activities to at least a moderate extent.

For buyers, knowledge selection and assimilation, and coordination are significantly higher than 4 (p<0.05); knowledge generation and leadership are significantly higher than 4 (p<0.10). For suppliers, knowledge assimilation is significantly higher than 4 (p<0.05); knowledge generation and measurement is significantly higher than 4 (p<0.10).

![Figure 4: To What Degree each of the Five First-order KM Activities Should Be Conducted](image)

(1-not at all; 3-moderately; 5-extremely)
When comparing the nine KM activities across buyer and supplier, we find that SD scholars think all the five first-order KM activities should be conducted by both buyer and supplier at the similar degree (p values ranging from 0.11 to 1), but buyers should conduct second-order KM activities at a higher degree than suppliers (p values ranging from 0.00 to 0.02). This finding suggests that, in order to achieve desired outcomes of supplier development, both buyer and supplier should play equally important roles in knowledge manipulation, but a buyer should play a more important role in second-order knowledge management activities, because buyer is usually the initiator and sponsor in supplier development.
4. A KM-Based Definition of Supplier Development

Applying the knowledge-based view of the firm, based our review of supplier development activities and knowledge management activities, we define supplier development from a knowledge-management perspective as:

*Supplier development is a set of knowledge management (KM) activities that are conducted by both buying and supplying firms and aimed at meeting the buying firm’s short- or long-term supply needs via expanding the supplying firm’s knowledge resources and/or knowledge handling capabilities. Supplier Development may involve first-order KM activities (i.e., knowledge acquisition, selection, generation, assimilation, and emission), as well as second-order KM activities (i.e., knowledge measurement, leadership, coordination, and control).*

SD scholars are invited to judge the success of this KM-based definition in terms of five criteria: completeness, accuracy, clarity, conciseness, and applicability. Overall, SD scholars think this new definition is at least moderately successful in these criteria (see Figure 6). Four of five criteria are significantly higher than 3: complete (p=.001), accurate (p=.001), clear (p=.002), and generally applicable (p=.011). In addition, SD scholars indicate that the adoption of this definition is moderately important for understanding supplier development.

![Figure 6: How Successful This Definition Is in Following Criteria](image)

(1-not at all; 3-moderately; 5-extremely)
References and Further Reading


For more details about knowledge management and knowledge chain theory, please read:


Acknowledgements

The authors would like to thank Dr. George A. Zsidisin (Virginia Commonwealth University), Dr. Chidambaranathan Subramanian (Annamalai University, India), Mr. Claudia Rebolledo (HEC Montréal), Dr. Elsebeth Holmen (Norwegian University of Science and Technology), Dr. Canan Kocabasoglu-Hillmer (City University London), Dr. Ying Liao (Meredith College), Dr. Manoj Kumar Mohanty (Larsen & Toubro Limited, India), Dr. Paul Ghijsen (Open University of the Netherlands, Netherlands), Dr. Fred Raafat (San Diego State University), Dr. Stephan M. Wagner (Swiss Federal Institute of Technology Zurich, Switzerland), Dr. Pilar Ester Arroyo López (Tecnológico de Monterrey, Mexico), and other anonymous participants for their kind participation in this study and valuable comments and suggestions.

Your Insight Matters!

Your participation in this study is highly appreciated and valued:

- If you participate in this study as a scholar or consultant, please click [this red link](#)
- If you participate in this study as a practitioner, please click [this blue link](#)
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Liang Chen is a doctoral candidate in Decision Science & Information Systems in Gatton College of Business and Economics, University of Kentucky. He holds a B.A. and M.A. in business from Renmin University of China. His primary research interests include supplier development, knowledge sharing, e-business, and innovation. His research has been published in Decision Support Systems, International Journal of Operations & Production Management, Journal of Electronic Commerce Research and Journal of Organizational Computing and Electronic Commerce, and presented in many leading conferences. Before coming to University of Kentucky, he worked as project manager, senior analyst, and department manager in a leading market research and consulting company in Beijing, China.

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