Follow the leaders

Scoring high on the supply chain maturity model – Mainland China perspectives on supply chain fulfillment
IBM Institute for Business Value

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Follow the leaders

Scoring high on the supply chain maturity model – Mainland China perspectives on supply chain fulfillment

Executive summary

Globally, leading companies have evolved and transformed their supply chain execution from static, isolated and internally-focused to externally collaborative. Many of them are further evolving toward an on-demand, customer-driven supply chain. According to previous value chain research by IBM, leading companies carry less inventory and have lower raw material shrinkage costs and a higher customer satisfaction rate.¹

Mainland Chinese companies are striving to meet their supply chain objectives; however there is still room for improvement in virtually every process area, as will be explored in this report. In comparison to other regions, Mainland Chinese supply chains achieve good and leading results on certain supply chain management (SCM) key performance indicators (KPIs), such as on-time delivery performance.

Mainland Chinese respondents agree that profitability is the first objective of SCM, but do not feel it is as critical as those in markets like Taiwan and India or in mature markets like Japan and Northern America do. Companies in Mainland China recognize the importance of cost reduction for the success of SCM, even though they are not facing as much cost pressure as those in the Australian/New Zealand (ANZ), North American and Japanese markets. Quality improvement is viewed as very important in SCM, as compared to other countries or areas. According to the surveys across the globe in 2006, responsiveness has now taken the place of quality among the three top objectives in all markets except Mainland China and Taiwan.

<table>
<thead>
<tr>
<th>Top three objectives</th>
<th>China</th>
<th>Taiwan</th>
<th>India</th>
<th>ANZ</th>
<th>North America</th>
<th>Western Europe</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased profitability</td>
<td>58%</td>
<td>75%</td>
<td>61%</td>
<td>47%</td>
<td>75%</td>
<td>56%</td>
<td>65%</td>
</tr>
<tr>
<td>Reduced cost</td>
<td>44%</td>
<td>41%</td>
<td>34%</td>
<td>56%</td>
<td>52%</td>
<td>38%</td>
<td>58%</td>
</tr>
<tr>
<td>Improved quality</td>
<td>40%</td>
<td>36%</td>
<td>41%</td>
<td>36%</td>
<td>36%</td>
<td>22%</td>
<td>36%</td>
</tr>
<tr>
<td>Increased responsiveness</td>
<td>39%</td>
<td>27%</td>
<td>63%</td>
<td>55%</td>
<td>41%</td>
<td>49%</td>
<td>39%</td>
</tr>
</tbody>
</table>

Note: Highlighted cells are the top three objectives as rated by respondents in each of the geographies.
What are the leaders doing?
Globally, the top supply chains appear to have a common trait: the ability to respond quickly to shifts in demand with innovative products and services, enabled by responsive processes and systems. These supply chains are better able to meet profitability, cost and quality objectives by adopting supply chain models that are strategically driven and aligned to their business environment (including products, markets, suppliers and customers). They are also consistently measuring their supply chain performance based on key indicators.

Over to you
Developing a top supply chain can be hard. Based on our analysis of the Mainland Chinese survey results, it is clear that supply chain management in Mainland China needs a comprehensive evaluation and improvement in the following areas:

- Appropriate SCM practices like formal distribution strategy and returns management for logistics as well as customer focus groups for customer order management aligned with well-defined supply chain strategy
- Supply chain performance measures like on-time delivery or percentage of returned goods established against well-defined SCM targets and industry benchmarks
- Best practice and world-class processes leveraged for operational excellence
- Advanced SCM technologies adopted for process effectiveness and efficiency
- Internal functions and external relationships with customers, suppliers and partners highly integrated and collaborative for improved supply chain responsiveness, supported by realtime visibility and event monitoring of customer, product, production and supply information throughout the supply chain.

FOLLOW THE LEADERS!
Introduction
The IBM Global Business Services 2007 Mainland China Value Chain Study examines the status of supply chain management of Mainland Chinese respondents across six key supply chain maturity areas:

- Synchronizing supply, managing demand: Customer-driven planning
- The perfect product launch: Product introduction and lifecycle management
- Global buying power through strategic sourcing: Dynamics of global sourcing and procurement implications
- Effective customer order management: Close connection to the customer
- Manufacturing as a foundation: A path to continuous improvement
- Logistics excellence for superior customer fulfillment: Perfect order attainment.

The study commenced in November 2006 and was completed by January 2007, with survey questionnaires administered to supply chain executives across Mainland China. It was structured into six separate surveys, one for each of the key supply chain areas. Each survey included 25 to 27 questions about overall business objectives, enabling technologies and current practices, as well as core performance data, such as level of resources (full-time equivalent), cycle times or efficiency rates. There were a total of 640 survey respondents, the majority of whom are in the industrial products, high technology and consumer products industries, with limited representation from retail, services, energy, distribution and transportation, agriculture and government.

This major research project was undertaken with support from the IBM Benchmarking program and the IBM Institute for Business Value to gain perspective on where global supply chain management is today and the direction in which it is evolving. This study aims to provide comparisons between Mainland China and other surveyed geographies and forms part of the global IBM value chain research program conducted progressively in North America, Western Europe, Japan, Australia and New Zealand, and India in 2005 and 2006.

This report highlights the key survey findings from the Mainland China Value Chain Study, focusing on the three key supply chain fulfillment functions:

- Customer order management
- Manufacturing
- Logistics.

This report also aims to compare Mainland Chinese study findings with leading practices based on the IBM on demand supply chain maturity model. Key recommendations and improvement opportunities round out each process area. Another report from this study is available focusing on the supply chain forward-planning processes of new product development, supply chain planning and sourcing and procurement.²

The IBM on demand supply chain maturity model is a tool that IBM designed for evaluation of how customer-driven and responsive a supply chain is. It describes how different organizations’ supply chains address the supply chain challenges for different supply chain process areas. The model groups supply chains into the following five categories of increasing integration, customer-orientation and responsiveness:

1. Static supply chain
2. Functional excellence
3. Horizontal integration
4. External collaboration
5. On demand supply chain.

Leaders understand that supply chain effectiveness must mean more than efficiency and low cost. Supply chains are also important drivers of revenue growth and profitability, as well as the primary source of responsiveness – or lack thereof. Top-performing supply chain executives are actively adopting leading management practices, such as:
• Integrating teams of sales and operations and reviewing demand plans regularly
• Integrating end-to-end processes with key service providers and other supply chain partners
• Using realtime information to create responsive, customer-driven processes
• Sharing information and risks with partners to reduce overall exposure
• Synchronizing supply and demand through planning and forecasting
• Developing variable cost structures as alternatives to fixed costs
• Outsourcing of non-core logistical or non-core manufacturing functions to third parties.

Effective customer order management
Customer order management (COM) starts with the order entry process and involves efficient maintenance of customer databases, opportunity evaluation for cross-selling and up-selling, back-order processing and post-order fulfillment transactions. Being an important customer touchpoint, effective COM has a lasting impact on customer satisfaction levels. In growing markets like Mainland China, the challenge is to align a company’s capability with the increasing number of customer transactions and the increased requirement for customer satisfaction, while generating additional sales.

Key survey findings
In this survey, increased profitability, increased unit volume and improved customer responsiveness are the top drivers of Mainland Chinese respondents’ COM performance. Nearly 70 percent of companies cited increased profitability as their major objective within COM. However, only 11 percent classify customers by profitability (see Figure 2). This is low compared to Europe and Japan, where about 19 percent (Europe) and 18 percent (Japan) of respondents classify customers based on profitability. Additionally, 15 percent of the Mainland Chinese respondents have no formal customer classification in place.

The most common customer satisfaction measurements are on-time delivery (72 percent of respondents) and damage-free delivery (60 percent of respondents). Only 20 percent of respondents achieve an average customer satisfaction rate above 95 percent, while nearly 30 percent are not even achieving a satisfaction rate of 80 percent. Additionally, Mainland China’s average customer retention rate of 80 percent is the lowest compared to India (95 percent), Japan and Western Europe (90 percent) and ANZ (89 percent). This indicates that the widely established measures intended to increase customer satisfaction (on-time and damage-free delivery) do not necessarily result in higher customer satisfaction and retention.
Leading customer relationship management (CRM) practices like customer focus groups and automated cross-selling aren’t extensively implemented by Mainland Chinese respondents. About one-third of the respondents (30 percent) have conducted customer focus group sessions to receive feedback and seek improvement areas. Some (27 percent) have adopted automated cross-selling, which was rated as the most effective practice, and some (19 percent) have practiced automated up-selling and customer self-service to varying degrees of effectiveness.

Early adopters are leveraging information technology to sustain and improve the implementation of the above leading practices, but less than one-third of respondents fully integrate different management functions like billing, logistics or sales force automation with their COM systems. Compared with other geographies, Mainland China is behind. Indian respondents have 50 percent of their management functions integrated with their COM systems.

Mainland China is on par with other geographies in the area of on-time delivery, but is not performing as well as other geographies on the remaining COM key performance indicators (see Figure 3).

**What the leaders are doing to provide leading order management services**

Recognizing the impact of effective COM on customer satisfaction, leaders are working toward closer integration with their customers (see Figure 4). Some of the important steps being taken by leaders are:

- Integrating processes end-to-end with key service providers and other supply chain partners to provide differentiated product and service bundling for different customer segments
- Providing holistic, realtime order process support with value-added functions like manufacturing capacity reservation or order configuration based on a collaborative design and execution portal
- Sharing product design specifications, demand requirements, capacities and supply constraints with internal and external supply chain partners
- Assuring complete focus on meeting customer demand with market fluctuations
- Closely integrating COM with supply chain planning and execution processes.

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**Figure 3. How Mainland China compares with other geographies in terms of achieving key COM performance targets.**

- **>95 % of total annual sales orders delivered on-time to customer request date**
  - Mainland China: 22
  - India: 24
  - ANZ: 64

- **More than 99% of total value of finished goods sales is not returned**
  - Mainland China: 13
  - India: 48
  - ANZ: 64

- **Customer retention rate higher than 95%**
  - Mainland China: 11
  - India: 48
  - ANZ: 64

- **100% of total annual sales orders fulfilled without stockouts**
  - Mainland China: 9
  - India: 29
  - ANZ: 46

- **Sales order process time lower than 1 hour**
  - Mainland China: 4
  - India: 10
  - ANZ: 37

*Source: IBM Institute for Business Value 2006 and 2007 Value Chain studies.*
As Mainland Chinese companies strive to improve customer management performance, it is also recommended that they extend the integration between different management functions like billing and COM systems to provide superior customer service. This integration will be supported by automated order management and invoicing across units.

Customer information should be shared across the company. Companies that are more mature under the Supply Chain Maturity model should share information (ideally, information on order transaction and movement) with suppliers and supply chain partners, such as logistics service providers.

**Key recommendations**

Mainland Chinese companies need first to identify the profitability of each customer or customer group. A key first step in this area is to decide how customers and channels should be segmented and managed, and how COM needs to be structured to accomplish a company’s service strategy and improve service costs efficiency.

Then CRM practices like customer focus groups and automated cross-selling should be implemented more extensively to increase customer satisfaction.

Mainland Chinese companies also need a set of effective management mechanisms to track and control key COM metrics. This is necessary to align COM with company strategy, define COM targets, and track, analyze and verify issues to continuously improve overall COM performance.

Source: IBM Institute for Business Value analysis.
Manufacturing as a foundation
In today's global environment, companies that manufacture products cheaper, faster and with higher quality will most likely win. Mainland China is now a leading manufacturer, not only of textiles and consumer products, but of increasingly sophisticated electronic equipment, software and other technologies as well. It has become an integral manufacturing hub for the rest of the world, and a major source of demand. Mainland Chinese manufacturers are competing increasingly to produce high-end, capital-intensive products using some of the world's best technologies and drawing from a pool of highly skilled talent.

Key survey findings
Nearly two-thirds of Mainland Chinese respondents prefer make-to-order as the primary order fulfillment practice. To achieve their objectives of quality improvement and profitability increase, just-in-time, effective staff collaboration and lean principles are preferred manufacturing practices. Value stream mapping, Six Sigma, Pull system/Kanban and radio frequency identification (RFID)/scanning aren't implemented extensively but are considered quite effective.

As in other areas of the supply chain, spreadsheets are used extensively in the manufacturing arena: 51 percent of Mainland Chinese respondents use spreadsheets for production planning, 64 percent for manufacturing execution and 78 percent for manufacturing maintenance. But all respondents suggest effectiveness is high when technology applications are used to support production planning, and 99 percent of respondents agree that effectiveness is higher when technology applications are used to support manufacturing execution.

The potential benefit of outsourcing was identified by Mainland Chinese manufacturers. Nearly half of surveyed respondents have partly outsourced manufacturing functions effectively. The high-tech industry has the highest adoption rate of manufacturing process outsourcing. The consumer products industry defines the benchmark for manufacturing cycle time, with nearly 50 percent having a cycle time of less than four hours. Industrial products is the leader for warranty cost with one-third having less than 2 percent warranty cost as a percentage of sales. The high-tech industry provides leading practices on raw material shrinkage cost, with 58 percent of respondents having less than 2 percent raw material shrinkage cost as a percentage of sales.

What the leaders are doing to achieve continuous improvement in manufacturing
As companies are moving up the maturity model toward an on demand manufacturing organization (see Figure 5), leading companies are rapidly responding to changes in the marketplace with advanced manufacturing capabilities, such as:

- Advanced product design and analysis that allows design for manufacturability, serviceability and material cost reduction
- Continuous process optimization and validation
- Lean manufacturing and continuous improvement
- Collaborating with customers, suppliers and manufacturing services providers (contract manufacturing) for competitiveness.
Key recommendations
To translate quality and profitability requirements into manufacturing performance, Mainland Chinese manufacturers should extensively practice quality management programs like Six Sigma, lean manufacturing and continuous improvement. Automated product quality control can support quality management initiatives. Further, manufacturing practices like quick changeover techniques or activity-based costing can provide more potential for improvements.

Success cases on manufacturing outsourcing should be good references for extending manufacturing outsourcing to increase production flexibility and optimize manufacturing’s cost structure.

Mainland Chinese manufacturers need to enforce higher utilization of technology/systems to improve process effectiveness related to production planning, manufacturing execution and maintenance, for example, through ERP-based optimization of internal scheduling and inventories.

Mainland Chinese manufacturing managers can often use other industries for benchmarking and as examples of leading practices.

Logistics excellence for superior customer fulfillment
Companies continue to strive to improve their logistics execution and performance in order to meet profitability and cost containment objectives. This translates into delivering the “perfect order” to meet customer requirements for the right product at the right time for the right price. In operational areas, such as sales channels, distribution and warehouse management, the logistics processes have to be aligned to customer requirements. Empowered customers expect on-time delivery
Follow the leaders and self-service with realtime order status information. In Mainland China, innovative logistics solutions have created new sales and distribution channels while improving customer satisfaction and retention. Continued sales growth will depend on accurate and efficient logistics management and servicing.

**Key survey findings**

For more than 35 percent of the Mainland Chinese respondents, total logistics costs represent more than 10 percent of sales. This is the second-highest rate among surveyed countries, only lower than North America. The leading practice is 5 percent or less.

Mainland Chinese respondents have limited systems/technology implemented in logistics process management. Forty-three percent use spreadsheets to support warehouse operations, and more than 50 percent of respondents use spreadsheets to plan for inbound material flow and outbound transportation. Less than 15 percent use vendor packaged software to manage logistics processes.

Mainland Chinese companies have a higher maturity level on logistics outsourcing in comparison to other geographies. Outsourcing was identified as a useful approach to enhance logistics performance. Transportation, warehousing and customs/export are the most widely outsourced logistics functions and are also seen as being most effective for logistics outsourcing by surveyed respondents.

On-time delivery (OTD) is a major indicator of customer satisfaction on logistics performance. In this survey, OTD was defined as scheduled delivery time versus the customer’s original request date (see Figure 6). Only 31 percent of Mainland Chinese respondents achieve OTD rates higher than 98 percent, which is lower than in Europe (48 percent) and North America (47 percent).

The average customer order cycle time for primary products is defined as the amount of time from customer authorization of a sales order to the customer receipt of product. For Mainland Chinese respondents, the average customer order cycle time is 28 days, which is the longest of all geographies. The leading performer is Australia/New Zealand with an average of 8 days.

![Figure 6. Performance on order delivery KPIs.](image)

**What percentage of sales orders is delivered on-time, as scheduled?**

<table>
<thead>
<tr>
<th>Percent respondents</th>
<th>China</th>
<th>Taiwan</th>
<th>North America</th>
<th>Japan</th>
<th>India</th>
<th>Europe</th>
<th>ANZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-90%</td>
<td>7</td>
<td>24</td>
<td>15</td>
<td>18</td>
<td>14</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>91-97%</td>
<td>36</td>
<td>14</td>
<td>33</td>
<td>29</td>
<td>24</td>
<td>28</td>
<td>29</td>
</tr>
<tr>
<td>98-99%</td>
<td>33</td>
<td>36</td>
<td>20</td>
<td>15</td>
<td>12</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>&gt;99%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


**For primary products, what is the average customer order cycle time in days?**

<table>
<thead>
<tr>
<th>Percent respondents</th>
<th>China</th>
<th>ANZ</th>
<th>Japan</th>
<th>North America</th>
<th>Europe</th>
<th>India</th>
<th>Taiwan</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5 days</td>
<td>14</td>
<td>19</td>
<td>14</td>
<td>55</td>
<td>15</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>8-10 days</td>
<td>69</td>
<td>61</td>
<td>61</td>
<td>55</td>
<td>54</td>
<td>38</td>
<td>37</td>
</tr>
<tr>
<td>11-20 days</td>
<td>61</td>
<td>55</td>
<td>55</td>
<td>54</td>
<td>38</td>
<td>37</td>
<td></td>
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<tr>
<td>&gt;20 days</td>
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</tr>
</tbody>
</table>

What the leaders are doing to achieve logistics excellence

As companies evolve up the supply chain maturity model toward an on demand supply chain (see Figure 7), they develop robust, global logistics capabilities that are variable in structure and cost – logistics networks that are highly integrated and can fluctuate to accommodate varying customer demand.

Many of the leaders are implementing the following practices:

- Outsourcing of non-core logistical functions to leading third-party logistics providers
- Integration of end-to-end processes with key service providers and other supply chain partners
- Realtime visibility and event monitoring of customer, product and supply and logistics information throughout the supply chain
- Managing the logistics network by monitoring events and exceptions.

Key recommendations

The relatively high logistics cost in Mainland China, as compared to other geographies, confirms the importance of and need for reducing logistics cost to improve profitability. Current logistics outsourcing initiatives should be extended to increase supply chain flexibility and reduce cost, as logistics service providers are able to operate at lower costs through economies of scale.

Additionally, it is important to restructure logistics processes to shorten order cycle time and improve order fill rate and on-time delivery.

Adoption of technology like warehouse management software or transportation software can help improve logistics management capability and performance metrics for Chinese companies. Moreover, technology deployment has become an imperative to achieve end-to-end supply chain integration and synchronization with a greater degree of cross-functional visibility and

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**Figure 7. Logistics excellence for superior customer fulfillment – Where are you on the supply chain maturity model ranking?**

**Static supply chain**

- Different logistics networks/infrastructure by business unit
- No enterprise approach to outsourcing of logistics and fulfillment functions
- Focus on production and supply to customers in ready state
- Experience high inventory levels/frequent stock-outs

**Functional excellence**

- Common network and infrastructure
- Some outsourcing – business unit differentiated
- Different services to key customers
- Customer order online/EDI, receive acknowledgements

**Horizontal integration**

- Open network supporting standards with rapid reconfiguration
- Variable cost structure
- Outsource all noncore supply chain activities
- Dashboards monitor end-to-end performance and alert exceptions

**External collaboration**

- Integrated distribution network with customers
- Common outsourced partners
- Visibility to entire order-to-cash cycle
- Commitments are demand-driven with managed replenishment

**On demand supply chain**

- Common outsourced partners
- Cross-functional visibility to inventory and shipments
- Differentiated services based on customer segmentation

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Source: IBM Institute for Business Value analysis.
reliability on inventory and shipments. Another option is to provide customers with online or electronic data interchange (EDI) tools to place orders and receive acknowledgements. Supply chain technology helps automate the process of exchanging payments, related documents and information among buyers, sellers, financial institutions and other involved parties. It supports related visibility and workflow for all the parties involved.

**Conclusion**

Over the last few years, execution of supply chain management has become a key driver of competitive advantage and offers great improvement opportunities for Mainland Chinese companies. Surveyed SCM executives have indicated their supply chains are increasingly challenged by corporate strategic directions and evolving business complexities. This study found Mainland Chinese companies have defined supply chain execution objectives aligned to current market environment and customer needs, however, the next step of transformation, translating the objectives into actions, is not being executed effectively. Defining the objectives is the first step. Translating objectives into action plans is the second one.

These companies are striving to meet their top objectives of increased profitability and improved quality. Forward-thinkers are leveraging leading practices like differentiated, customer pull-driven fulfillment as well as outsourcing all non-core supply chain activities to third-party logistics providers. In each of the process areas, advanced practices and processes like internal and external collaboration and third-party integration (with customers, suppliers and trading partners) have to be implemented.

Additionally, advanced technologies, such as realtime visibility and event monitoring of customer, product and supply information throughout the supply chain, are increasingly being utilized to improve process efficiency and performance. More than that, Mainland Chinese companies should use technology more extensively to support SCM processes and leverage the know-how and capabilities of all partners involved in the supply chain to increase responsiveness and competitiveness.

The 2007 Mainland China Value Chain Survey indicates that many Mainland Chinese companies are well-informed and gearing up to meet the challenges and opportunities, but still have significant room for improvement in delivering high performance with increased responsiveness. This study presents the insight for them to follow the leaders, set new benchmarks and eventually lead the way.
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References