
Supply Chain Prestudies

Jim Ayers

Organizations that decide to compete on the basis of supply chain design and performance usually must begin by redesigning their supply chains. They must perform a prestudy to assess their chains' strengths and weaknesses. This article explains how to conduct such a study.

Identifying supply chains in a complex operation is something of an art. Many operations overlap. Many departments support multiple products. Products are sold to a variety of customers in different market segments, each of which has different objectives.

Because of this complexity, many companies evolve to functional organizations with “one-size-fits-all” supply chains. These are seldom efficient in terms of cost, service, or speed in meeting the competitive demands of customers. Newcomers, with little investment in outmoded structures, take over markets with superior supply chains. Extracting and evaluating the underlying supply chains embedded in the organization is the beginning of the improvement effort. The prestudy starts to “disassemble” functional processes and to catalog the differences among customers that can lead to tailored, competitive supply chains.

The prestudy should last no longer than one or two weeks. One or two analysts are sufficient for the effort. The conclusions of the prestudy should focus on the best opportunities for improving competitive position through supply chain redesign. The effort may reform an existing chain, create new ones, or combine multiple chains into one. In many cases, the information gathered in a prestudy will be preliminary — that is, management's best guess as to the situation. Judgment should determine whether further verification of an assumption is warranted. If so, the plan should include this work.

Jim Ayers is a principal with CGR Management Consultants in Playa del Rey, California. He can be reached at (310) 822-6720 or at jimayers@compuserve.com.

Organize end users

The prestudy should begin with end users. These may not be direct customers for an organization, but they ultimately determine the success or failure of the product. To understand what will make the supply chain more effective, one has to understand the motivations of these users.

Define market segments

The prestudy team should list user groups. Groupings may be by application of the product, location, volume, supply chain to reach the user, or other characteristics. Exhibit 1 depicts the possible result.

Next, form segments from the customer groups. One or more groups may make up a segment. Combinations of groups into segments are particularly valid when they share supply chains. Therefore, one might have a revised chart that looks like Exhibit 2.

Four customer groups have been combined into three segments for the purpose of supply chain design. This could be due to commonality in the supply chains that reach them plus the belief that they have common requirements in terms of supply chain design.

Map products to segments

Next, list products or product lines. A line may be a group of products produced in the same facilities, or it may include different products that serve common markets. A common supply chain could also define a product line. An example would be “all products sold in Asia” or “all products sold through distributors.” Map the product lines to segments. The resulting table might look like Exhibit 3. In the table, the dollar

Customer group 1	Customer group 2	Customer group 3	Customer group 4
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Segment 1 (Customer groups 1 & 2)	Segment 2 (Customer group 3)	Segment 3 (Customer group 4)
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signs indicate product profit by segment. It shows that product C is the most profitable by virtue of sales to segment 2. Product line B is the least profitable, with sales to Segment 3.

Identify supply chains

Identify the supply chains supporting the customer segments. In the preceding example, three supply chain types may be distinguished. These include

- One supply chain for all three segments. This is most common in smaller companies.
- A separate supply chain for each product line. This is often the case when each product is made by a different profit center. This is most common in larger companies.
- Supply chains organized by customer segment.

Seldom do we see supply chains organized around customer segments.

If two supply chains are distinguished, they might appear as Exhibit 4. In this case, we show two supply chains (bearing the prefix SC). As commonly found, they are product oriented. SC1 serves product lines A and B. SC2 serves C and D.

Describe the supply chain(s)

With the supply chains identified, their configuration should be documented with flowcharts and supporting data. These need not be elaborate given the time limitations of a prestudy but they

should convey an understanding of the basic structure of the chains. Accompanying the flowcharts should be metrics and other information that characterizes current performance.

Document physical flow

Fundamental to most supply chain representations is physical flow. The prestudy flowchart should show the following:

- Echelons of the supply chain, including major suppliers, manufacturing centers, distribution centers, warehouses, and customer segments
- Methods of transport between echelons
- Volumes of product flow in dollars, units, or volume
- Cycle time for moving material in the chain, preferably broken out by echelon
- Inventory levels along the chain, including those at suppliers and customers

Document information flow

Information flow is an increasingly important component of the supply chain. A great deal of competitive advantage can be gained by improving information flow. Among the elements needed to describe information flow are the following:

- An information flowchart that shows where sales information is generated
- Decision points along the chain, including the people responsible for the decisions
- An inventory of information systems tools used to plan and control the process
- A listing of formal and informal contracts between supply chain participants

Document financial flow

A similar process should include financial flows. This is particularly true if there are any innovations in the way this flow is handled. Among the topics to include are the following:

- Cash-to-cash cycle — this shows how long

	Segment 1 (Customer groups 1 & 2)	Segment 2 (Customer group 3)	Segment 3 (Customer group 4)
Product line A	\$\$\$	\$	
Product line B			\$
Product line C		\$\$\$\$\$	
Product line D	\$\$		

Exhibit 4. Sample Table with Two Supply Chains				
Supply Chains		Segment 1 (Customer groups 1 & 2)	Segment 2 (Customer group 3)	Segment 3 (Customer group 4)
SC1	Product line A	\$\$\$	\$	
SC1	Product line B			\$
SC2	Product line C		\$\$\$\$\$	
SC2	Product line D	\$\$		

it takes from the first expenditures to the time money is collected from the end user

- Balance sheet figures including inventories, accounts payable, and accounts receivable
- Estimated activity costs across the chain; use end user purchase price to “allocate” funds to supply chain activities

Document new product flow

New products can often upset existing supply chains. To the extent new products are contemplated, the processes should be examined. This should include

- Expectations for new product introductions and supply chain implications
- An understanding of how the new product process incorporates supply chain participation, if it does
- Special supply chain requirements for supporting new product development. (e.g., example is finding reliable sources for components requiring special features)

Document management processes

Time should be spent on understanding basic planning processes and recent initiatives. This will help frame management’s approach to process improvement, strategic planning, and capital investment. The processes described here are usually available in document form.

- Understand strategic plans that affect the supply chain. Review strategic initiatives and competitive evaluations.
- List recently completed and ongoing improvement projects. This includes facilities, equipment, and systems. Trace back at least three years and forward over the company’s planning horizon.
- Explain the justification process for capital investments. If a procedure exists, review how it is applied. If possible, review candi-

date projects falling within the most recently completed capital budgeting cycle.

Interview executives

The prestudy should include interviews in one-on-one meetings, group settings, or workshops. These should draw out the following information.

Describe customer requirements by segment

Understand what customers demand by segment. Use interviews, market surveys, or direct input from key customers.

Assess relative strengths and weaknesses by segment

Gain an understanding of current position. This can be based on opinions of management, market share data, and financial reports.

Understand barriers

Any organization has constraints on its ability to act. Here is a list of possible constraints or barriers that should be considered in planning supply chain changes.

- *Human resources.* Considerations for employee relations and constraints on talent
- *Financial.* Constraints on capital availability and objectives for profitability
- *Capacity.* Limitations on the ability to increase or decrease capacity
- *Product lines and customers.* Products and customers, whether they are profitable or not, that must be supplied; the source of the constraint
- *Past capital investments.* Infrastructure that must be included in future plans

Prepare conclusions

The conclusions condense the data into recommendations for proceeding. They should set the direction for guiding supply chain changes. Among areas for comment in the conclusions are

the following:

- Effectiveness of current supply chains and their appropriateness in light of customer expectations
- New supply chain proposals that would more effectively serve a customer segment
- Recommendations for dealing with constraints
- Comments on the role of systems and needs for systems upgrades
- Opportunities for improving profits and cash flow in the supply chain
- Questionable product lines and market segments in terms of profit and the supply chain capability to serve them
- Requirements, schedule(s), and program plan(s) for a multi-phase supply chain improvement project ▲