Managing Operations Across the Supply Chain 4th edition Swink Solutions Manual

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From Chapter 2
Operations and Supply Chain Strategy

Suggested Answers to Discussion Questions

1. Why should the firm never outsource its core capabilities? What happens if the firm is approached by a supplier who is willing to supply goods and services based on these core capabilities at a significantly lower price? What should the firm do?

Its core capabilities are the source of the ability of the firm to compete. If you outsource them, then you run the risk of "teaching" someone (i.e., your supplier) about what you do and what makes you successful. If they can learn from you, then they can become a strong competitor of yours.

If you are approached by a firm that is willing to supply goods and services based on your core capabilities, then you really have two options before you. The first is to see if they are really able to do a better job of executing these core capabilities than you are. If that is the case, then you have two options before you: (1) learn from them or (2) get out of the market – they are better than you. The second, assuming that they are not able to do a better job of competing on your core capabilities, is to turn down their offer. They are obviously willing to take a short term loss in exchange for a long term win (gained when they learn about your core capabilities).

2. Apply the corporate/SBU/functional planning hierarchy introduced in this chapter to your university/college or business. What would be the equivalent to corporate planning? SBU planning? Functional Planning?

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In a university, you would find the following relationship

Strategic Planning Hierarchy	University Equivalent
Corporate	University
SBU	College
Functional	Department

3. How would you define capabilities within a school or business?

Again, the capabilities are those specific skills or processes that an organization develops to solve or address specific types of problems. Consequently, using this approach, the capabilities of an organization such a school or business can be found in its faculty (their strengths, and research focus), the pedagogy by which material is taught, and the focus of the school (finance, supply chain, operations management).

4. When can a consumer be a critical consumer? In other words, when does it make sense to focus on consumers such as retail stores, distributors, or buyers, rather than on the end consumer?

A consumer such as a retail store, distributor or buyer becomes a critical customer when the consumer busy based on factors such as ability. For example, consider snack foods. Few consumers really have strong brand preferences; they tend to buy what is available. Consequently, the firm has to target the person or function that has the greatest impact on availability. In this case, it would tend to be the retail store, distributor or buyer. By the way, this is the strategy that Frito-Lay has pursued and it has been highly successful.

5. A critical concept introduced in this chapter was that of the value proposition. Explore two competing products (e.g., RIM's Blackberry and Apple's Iphone). Identify the underlying value propositions present in these products and how this proposition is evident in the resulting products.

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To understand the differences between the Blackberry and the IPhone, consider the following table:

Trait	Blackberry	IPhone
Value Proposition	To offer a product that is an extensive of MS Outlook and Entourage so that the user can work on business wherever they are	To offer a product that essentially becomes an information and communication system for the user.
How is Value Proposition implemented	Presence of a real keyboard Security in the applications Very good business applications Extreme durable so that the user never has to worry about its inability to fulfill its value proposition	Extensive collection of applications Ability to host itunes and to play music recorded or stored using itunes Large number of applications that are communication oriented (e.g., youtube, safari, photos).

6. Core competencies are critical issues in operations management. Are there any instances in which a firm's core capabilities can be a liability rather than an asset?

This situation occurs when the market has changed and it no longer values the core capabilities offered by the firm. In this case, the problem is that since core capabilities are so central to the firm and so embedded in the firm's character (i.e., culture), the challenge facing the manager who wants to change the core capabilities to something that the market values is that the organization and its culture will "fight" that person. People know that the existing approaches worked in the past; there is uncertainty regarding the new capabilities; why change

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7. Fit is critical to the development and maintenance of a successful operations strategy. Suppose that we are faced with a firm in which there is a lack of fit between the outcomes desired by the critical customer, the value proposition, and the firm's capabilities. What options are available to the firm in the short term when dealing with this lack of fit? What is the impact of the lack of fit? What are the implications of the firm trying to improve the fit?

Lets begin with the second question – the impact of lack of fit. When there is a lack of fit, we can expect the following outcomes to occur:

- Customer dissatisfaction to grow.
- Internal dissatisfaction grows (because our people feel that they are trying to do a good job but the customers don't seem to appreciate).
- Profits fall (as cost increase because we are making the system do something that it is designed to do).
- We create opportunities for our competitors. We have a gap between what the customer wants and what the system can do – such gaps are attractive for competitors (either existing or new).

When faced by a lack of fit, the firm can do the following:

- Change the critical customer being pursued (to one more consistent with the capabilities that we offer)
- Change the capabilities offered
- Change the value proposition
- Live with the mismatch (not a long-term solution),

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Irrespective of the option, the firm must be prepared to invest time and resources in implementing the options.

8. Suppose that you are the owner of pizzeria that is located near to a university or college. How could you use the concepts of Order Winners, Order Qualifiers, and Order Losers to help develop and implement an attractive business model?

These concepts could be used to identify what the competitors are doing in terms of pizza and to identify the opportunities for a new pizzeria. For example, we know that Lil' Caesar's competes by focusing on availability and cost; Domino's focuses on delivery and price (and now on quality, if we are to believe the recent advertising campaign). We could choose to compete by focusing on variety (different special pizzas every week), or quality at a reasonable prize.

9. Why should metrics be regarded as primarily methods of communication? Think about the relationship between a metric, the strategy, and the task being carried out by an operations person.

What a metric does is to restate the strategy into terms that make sense to the person. For example, what a metrics does is to essentially say to a user, "for our firm to compete on customer service, you must ensure that when managing inventories, you maintain a certain minimum level of inventory accuracy (e.g., 98%), that all orders are filled with 20 minutes, and that we strive to fill the orders as completely as possible (we strive for a 99% line fill rate – i.e., on average, the customer should expect that we will fill at least 99% of the orders by line).

10. A metric consists of three elements: the measure, the standard (what is expected), and the reward. Why are all three elements critical? What happens to the effectiveness of a metric when one of these three elements is missing?

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To answer this question, consider what happens if you remove any one of the three elements:

- Without a measure, the person has no way of assessing themselves or their performance.
- Without a standard, they do not know what is an acceptable level of performance.
- Without a reward (punishment), then their ability to do well or poorly does not matter since they are not rewarded for good performance nor are they punished for inadequate performance.

11. What is the impact of sustainability on the business model? How does it affect issues such as the Order Winners, Order Losers, and Order Qualifiers? How does it affect the identification of the critical customer? When addressing this question, look up such products as Chrome or Timbuk2 for bags or Teva or Mio or Timberlane for shoes.

Sustainability means that we focus not only on the long-term survivability of the firm but also on the ability of the firm to reduce its level of pollution (this concept is discussed in greater detail in Chapter 17). With a greater emphasis on sustainability, we can expect to see sustainability move to being an Order Qualifier (for many), an Order Loser (if you fail to provide the appropriate levels of sustainability, we will not buy from you again), or even an Order Winner (we emphasize sustainability in our decision). This issue may cause us to target new critical customers – customers for whom sustainability is a critical consideration and for which they are willing to pay a premium. The reason for the companies is that they are firms that have chosen to compete on the basis of sustainability.

12. Why is there a need for the four dimensions of the balanced scorecard?

Without balance, the firm will tend to focus on only one or two of the major dimensions – thus causing long term problems. All four dimensions are important because they deal with issues critical to the firm and its long-term success:

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- Financials – we need to emphasize the need to make money
- Customer support/service – we succeed only to the extent that the customer is happy with what we are doing
- Processes – we need to achieve financial performance and customer service through processes rather than a lot of hard, uncoordinated work.
- Building for the future – we must recognize that ultimately everything that works in the short term will not work in the long-term.

13. As North American firms increasingly turn to product innovation, the management and protection of Intellectual Property becomes an important issue. Discuss how intellectual property considerations can affect such areas in supply chain strategy as:

a. Supplier relationship

b. Supplier contracts

It can affect whether we have a close relationship (close because we need to work with suppliers on developing and delivering products that are feasible and that ones that our customers want and are willing to pay for). This means that our suppliers have to understand our customers and we have to understand the capabilities of our suppliers.

Contracts become a bit more challenging because we have to balance the need to protect and preserve any intellectual property generated against the need to keep the contract simple and flexible. If a contract is over-restrictive, then it does not encourage innovation and it discourages cooperation. However, it is important that intellectual property must be considered as a real asset – as real as a building and one that has value. Consequently, it must be protected and procedures be put in place to deal with it and its ownership. These guidelines must be set out in the contract.

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14. Elm Furniture Company, a medium-sized, publicly traded manufacturer of wood-based office and home furniture systems, has agreed that its major goal should be to "Become recognized as a value and social leader in the wood furniture industry." Consistent with this macro goal, Elm Furniture has identified the following specific objectives:

- **Become recognized as a leader in the use and application of environmentally responsible practices and systems.**
- **Achieve sales growth averaging 5 percent more that of the industry average.**
- **Keep stock price stable relative to that of the industry average.**
- **Reduce price and waste at all levels of the firm.**
- **Be recognized as a design leader.**

As previously observed, the balanced score draws in four major dimensions: (1) outcomes/financial performance; (2) process orientation; (3) customer service; and, (4) building for the future. Lets apply these dimensions to the four groups identified:

Dimension	**Operations Mgt**	**Product Engineering**	**Sales & Marketing**	**Purchasing SCM**
Outcome Performance				
Goals	Reduce the cost of environmental wastes generated by manufacturing	Reduce the cost of materials that are not environmental responsible Reduce the life cycle costs of new products designed.	Increase sales by 5% more than the industry average Increase the percent of sales attributing to products that are environmentally responsible. Be recognized as an industry design leader	Reduce the total costs of purchases (by attacking environmental waste) Increase the size of $ buys from suppliers that have demonstrated environmentally responsible systems.

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Metrics	Reduce manufacturing costs due to waste by 5% Reduce disposal costs by 10% Increase the revenue generated by selling scrap or disposed items by 10%	% of new product designs are use renewable energy % of each product can be recycled upon disposal Number of awards for innovative designs Number of awards for sustainable design Number of products that have certified at silver/gold levels of the "cradle-to-cradle" standard[1]	Sales rates % of sales from products that are environmentally responsible Profit levels by product line	Changes in Purchase costs (relative to the target rates) % of suppliers that have attained ISO 14001 certification[2] % change in dollar value of purchases from suppliers that are environmentally responsible.
Process Orientation				

[1] A design certification standard proposed by MBDC, and as described in the following web site: http://www.c2ccertified.com/. Cradle to Cradle Certification provides a company with a means to tangibly, credibly measure achievement in environmentally-intelligent design and helps customers purchase and specify products that are pursuing a broader definition of quality. This means using environmentally safe and healthy materials; design for material reutilization, such as recycling or composting; the use of renewable energy and energy efficiency; efficient use of water, and maximum water quality associated with production; and instituting strategies for social responsibility. See Chapter 17 for a more detailed discussion.

[2] ISO 14001 certification is a certification process that has been developed for assessing the effectiveness of a firm's environmental management system. This standard is discussed in greater detail in Chapter 17.

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Goals	Identify and improve the performance of those processes that are creating most of the pollution.	Implement a new product design process that is both innovative and that encourages sustainability	Develop a process for making the marketplace aware of the developments now taking place.	Develop and implement processes for increasing awareness of the need for innovation from the supply chain and for enhanced sustainability
Metrics	Number of process-focused changes aimed at reducing pollution Amount of pollution reduced by changes to manufacturing processes. Number of pollution-oriented Kaizen Events[3]	Implementation of a new design process by xx/xx/2011. Number of design-process initiated changes that contribute to either innovation or sustainability Number of products redesigned to be consistent with new innovation or sustainability requirements	Number of product announcements by A list sources (e.g., Business Week, Wall Street Journal). Awards for sustainability and/or innovation.	Number of improvements or changes resulting in innovation and/or sustainability suggested by suppliers. Number of innovation or sustainability suggestions made by suppliers Involvement of suppliers in joint activities aimed at reducing cost, improving innovation or enhancing sustainability.
Customer Service				

[3] The concept of a Kaizen Event is described in greater detail in Chapter 3.

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Goals		Critical customers recognize and value the new products that emphasize innovation and/or sustainability	Customers recognize that Elm Furniture is a leader in innovation and sustainability	
		Survey results where new product introductions are on average ranked above 4 (on a 5 point scale, where 5 is critical feature of Elm Furniture)	Market studies that indicate that customers rank Elm Furniture in the top 10 percent of firms in terms of overall innovation and sustainability	
Planning for the Future				
Goals	To have plans for reducing costs and increasing availability of manufacturing facilities to accommodate new product introductions	To have plans for improving product design process with an emphasis on innovation and sustainability	To have plans for increasing customer awareness of Elm Furniture in terms of sustainability and innovation	To have plans in place for ensuring that supply base can support future strategies based on innovation and sustainability
Metrics	A plan approved by management and presented by operations to be in place by no later than xx/xx/2012	A plan approved by management and presented by product engineering to be in place by no later than xx/xx/2012	A plan approved by management and presented by sales/marketing to be in place by no later than xx/xx/2012	A plan approved by management and presented by purchasing/supply chain management to be in place by no later than xx/xx/2012

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15. In this chapter, you were introduced to Huffy Bicycles. You were also told that the critical customers were store managers and purchasing managers. Now, assume that Huffy decided to target first parents and then children as their critical customers (using the information provided below). What impact would this shift in critical customer have on you – how would you would design the resulting operations management system (including the supplier base)?

Commented [dft1]: Need answers to 15 and 16

Critical Customer	Order Winners	Order Qualifiers
Parent	**Acquisition Price** **Durability (has to be passed down)** **Ease of maintenance (does not cost much to maintain over the summer)**	**Safety** **Availability**
Child	**Style (colors)** **Can be easily customized** **Newness (I have the first one on the block)** **Imitation (it is what I see others having on television)**	**Availability** **Maintenance**

Before beginning this problem, it might be useful for the instructor to hand out the following article:

Fisher, M.L. 1997. "What is the Right Supply Chain for Your Product?" *Harvard Business Review.* (March-April), pp. 105-116. Reprint 97205.

For the parent, this would mean that the operations management process would emphasize issues such as:

- Acquisition price – the system would have focus on reducing waste and on focusing on cost when evaluating processes and operations. We would look for suppliers who provide the needed components at the lowest cost without

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compromising delivery (which affects availability and quality (of which safety is a critical component)).

- Quality – One of the major attributes of quality is durability, or how the product performs under adverse conditions. Here, we would begin by focusing on product design. Since our goal is durability, we would have to design bicycles that are more resistant to damage and that can resist. We would then have to buy components from our suppliers that meet these requirements for product durability. Finally, we would have to design in strong linkages with our downstream (customer) base to ensure that we are identifying any problems with the usage of the products.
- Ease of Maintenance – again, design is critical. We must be able to design the bicycle so that (1) the parts do not break; and, (2) if they do break, they can easily repaired. For the supply chain, this means that we must identify suppliers who can provide components that are of sufficiently high quality (not too high but high enough so that they do not break with any degree of frequency) and can be easily replaced. This may mean that we do not go for the "latest and greatest" in terms of technology but rather go for proven technology that has been found to work. We also have to build links with our customers (e.g., the dealers) so that we can identify early on design features or parts with which quality/durability is a major concern.

However, a very different supply chain and operations management system is required if we focus on the child as the key customer. What is critical here is the

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responsiveness of the operations management/supply chain systems. Why? Because when we deal with styles, we find that styles change rapidly. What was popular in one time period may not be popular in another. Consequently, we have design and release new products on a regular basis. We may also have to work with certain television shows to ensure that our new designs are highlighted on the shows (with the goal of encouraging the key customer – the child – to want the product). To achieve these objectives, as previously noted, we need a responsive supply chain – one that can build more of the products that are wanted, one that can quickly kill the products that are not wanted, and one that can get feedback from the field quickly. Consequently, the following changes are needed:

- Greater emphasis on product design and redesign.
- Greater emphasis on suppliers that can respond quickly to changes in design and in volume. We want suppliers that can ramp up quickly to produce the components needed to support the winners and that can quickly drop components for products that have not met demand.
- Here, we see a greater role for strong linkages between ourselves and the stores. We need to know what is selling and what is not selling; we need to know as soon as possible. This requires close cooperation. BTW, when we get here, the instructor can show that these linkages are becoming critical today as they form the basis of the development now referred to as *demand sensing*.

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16. Using a SWOT analysis, can the operations management system be a strength? Can the operations management system be a weakness? Provide examples.

To address this question, we really are looking at the business model. Operations management can be a weakness when the capabilities that it embodies: (1) are not in synch with the demands of the critical customer; and, (2) do not support the value proposition.

Can the operations management system be a weakness? Yes. The best example offered is that of the Ford manufacturing system in the late 1920s. At this time, the Ford manufacturing system had been designed and managed to reduce production lead time, maintain standard quality, and most importantly reduce cost. This, it was really well able to do. This was the period when the motto at Ford was "you can have any color as long it is black."

Yet, there were significant changes in the customer base. The key customer initially had been interested in wanting to buy a car and they were interested in price. This, Ford was able to do. Yet, once this demand was satisfied, the customer demand changed. What they wanted was a reason to buy a new car more often. Under the Ford model, the only time that you bought a car was when you needed to replace the existing car. Yet, customers wanted something different. They wanted a reason to buy a car before it broke down. General Motors responded to this latent demand by offering model

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years, introducing changes in product design, and offering options (such as color). The customers embraced these new traits. The problem was that Ford was unable to respond. The customer wanted flexibility, variety and responsiveness. Ford's manufacturing system gave them standardization, lack of variety, and low costs. There was a major mismatch between the demands of the customer and the capabilities of the manufacturing system. Ford's manufacturing system, once a critical strategic asset, had now become a strategic liability and a weakness.

On the other, the operations management system can become a strength when it supports the customer needs and strategic objectives. The best example of this situation is Zara.

Zara is a mid-range fashion manufacturer. Its critical customers are women in the 18-35 age range. These people visit a Zara store once every three week; they expect something new when they come; they are not welling to accept stockouts. Given that Zara deals with products that are fashion driven, it must introduce new fashions on a regular basis. The company does not know which ones are going to succeed; which ones will fail. As a result, Zara's system is designed for responsiveness.

It introduces new products in small batches to its stores. At the stores, as products are sold, this information is sent back immediately to Zara

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headquarters in Spain. In addition, Zara encourages its store people to send back any information and suggestions about changes to existing products or new products that might be attractive to its key customers.

How does Zara forecast? It is really quite simple. If the new design sells, Zara produces more; if the new design does not sell, it produces less or it even stops production.

For this model to work, the operations management system has to be fast. This is something that Zara does well. From the time that the store reports that it needs more product until the store receives a replenishment shipment is often less than 5 business days. Zara does this by having a system that is built to be responsible. It has centralized replenishment in its manufacturing facilities located in Spain. It has also taken the following actions:

- All of Zara's fabric is bought in the form of "grey" fabric – fabric that must be dyed to order.
- Once the order is received, the fabric is dyed and then cut at Zara's facilities.
- The cut material is then sent out to be assembled by its suppliers. These suppliers can adjust capacity quickly because their capacity consists of sewing machines (relatively low cost) and people.

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- Once the items are assembled, they are sent back to Zara's warehouses, which essentially act as cross-docks.
- The items are then picked to the individual store orders and these orders are then sent out for shipment to the stores – something easily done because the warehouses are located next to the airport.

As we can see, Zara's manufacturing system acts essentially as a strategic asset – it is critical to Zara's success.s

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Problem Solutions

Categories	Values
Sales	$32,000,000
Cost of Goods Sold	$20,000,000
Variable Expenses	$4,000,000
Fixed Expenses	$6,000,000
Inventory	$8,000,000
Accounts Receivable	$4,000,000
Other current assets	$3,000,000
Fixed Assets	$6,000,000

1. Given the preceding information:
   a. What is the Net profit margin for this firm?

To solve this problem, we must use the Strategic Profit Model, as presented in Figure 2-5. If we plug the numbers in, we find that the net profit margin is 6.25% (2,000,000 net profit divided by 32,000,000 sales).

   b. What is the Asset Turnover?

Again, using the SPM, it is 32,000,000 sales divided by 21,000,000 (total assets) or 1.52.

   c. What is the Return on Assets?

Again, using the SPM, it is 6.25 (Net Profit Margin) multiplied by 1.524 (Asset Turnover) or 9.524%

   d. What is the size of the total assets used by the firm?

It is 15,000,000 in current assets (Inventory + Accounts Receivable + Other Current Assets) + 6,000,000 in Fixed Assets or $21,000,000

2. For the prior question, management wants to double the return on assets, without affecting sales, cost of goods sold, variable expenses, fixed expenses or fixed assets. Rather it wants to focus on either inventory or accounts receivable.

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a) Can management focus on either inventory reductions or accounts receivable reductions alone?

The key here is to change the asset turnover from 1.524 to 3.05 (we get this number by taking the ROA of 9.524 x 2 (remember – we want to double the ROA) and then dividing by the Net Profit Margin of 6.25). This means that we have to reduce the total assets from $21,000,000 to $9,140,000. Since fixed assets are $6,000,000, this means that we must reduce the current assets from $15,000,000 to $3,140,000. Given that current assets are $15,000,000 now, we are talking about a major reduction. It can be done but it will be very hard.

b) How can it achieve this objective?

A more realistic approach is to focus on increasing the net profit margin while also simultaneously reducing increasing the asset turnover. To achieve this, we can do the following:

- **Reduce the cost of goods sold from 20,000,000 to 18,000,000 (a 10% reduction)**
- **Reduce the inventory from $8,000,000 to $7,000,000 (a 12% reduction)**
- **Reduce the Accounts Receivable from $4,000,000 to $3,500,000 (a 12% reduction)**

We can realize a Return of Assets of 20.513% - in excess of the 19.048 requested by top management.

c) Do you see any downsides in pursuing this objective through a focus on inventory/accounts receivable reductions?

By focusing on inventory and/or accounts receivable alone, several problems can be envisioned:

- **Customer service goes down significantly resulting in increased stockouts due to reduced inventory.**
- **We become more difficult to deal with because we are not willing to offer our customers credit.**

These outcomes can ultimately result in not only lower total assets but also lower total sales.

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3. You are the operations manager for a small kayak and canoe manufacturer (Valley Kayaks) located on the Pacific Northwest (Oregon). Lately your company has experienced product quality problems. Simply put, the kayaks that you produce occasionally have defects and require rework. Consequently, you have decided to assess the impact of introducing a total quality management (TQM) program. After discussing the potential effects with representatives from marketing, finance, accounting, and quality, you arrive at a set of estimates (contained in the following table). Top management has told you that they will accept any proposal that you come up with PROVIDED that it improves the return on assets measure by at least 15 percent. Would you go forward with this proposal to improve quality?

Category	Current Values	Estimated Impact of TQM
Sales	$2,000,000	5% + (improvement)
Cost of goods sold	$1,500,000	0%
Variable expenses	$ 300,000	8.25% − (reduction)
Fixed expenses	$ 100,000	0%
Inventory	$ 300,000	25% −
Accounts receivable	$ 100,000	0%
Other current assets	$ 500,000	0%
Fixed assets	$ 400,000	0%

Commented [SM2]: Please change inventory to 25% - (reduction) – Add reduction to end of 25%

Again, lets interpret the data, with the changes:

Categories	New values
Sales	2,100,000
Cost of goods sold	1,500,000
Variance expenses	275,250
Fixed Costs	100,000
Inventory	225,000
AR	100,000
Other Current Assets	500,000
Fixed Assets	400,000

Plug this into the SPM model, and we get the following results:

With changes, ROA is 18.35%

Without changes, ROA is 7.69%

The changes represent a 238.6% improvement ((18.35/7.69)*100)

Management should approve the proposal.

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4. As the operations manager for Valley Kayaks (as described in the previous question), you find yourself faced with an interesting situation. Marketing has informed you that they have lost a number of sales because of a lack of inventory. Kayaks, being seasonal in nature, have to be in stock at your dealers if they are to be sold (customers are not willing to wait). The director of marketing proposes that you increase inventories by 25 percent (a major investment to you). She has also given the information in the following table. How would you assess this proposal from marketing? Would the projected change in ROA justify the inventory investment?

Category	Current Values	Proposed impact of inventory increase
Sales	$2,000,000	25% + (improvement)
Cost of goods sold	$1,500,000	0%
Variable expenses	$ 300,000	10% − reduction (why?)
Fixed expenses	$ 100,000	15% + (increase)
Inventory	$ 300,000	25% +
Accounts receivable	$ 100,000	0%
Other current assets	$ 500,000	0%
Fixed assets	$ 400,000	0%

First, we have to understand the impact of the changes:

- Sales can be expected to go up because we have inventory present to meet demand
- Variable expenses can go down because we have less expediting and the such
- Inventory goes up – to be expected
- Fixed costs go up because of the space needed to store the inventory

We have the following results (using the SPM excel template available):

Category	Current Value	New Values
Sales	2,000,000	2,500,000
Cost of Goods Sold	1,500,000	1,500,000
Variable Expenses	300,000	270,000
Fixed Expenses	100,000	115,000
Inventory	300,000	375,000
Accounts Receivable	100,000	100,000
Other Current Assets	500,000	500,000
Fixed Assets	400,000	400,000
ROA	7.69%	44.73%

What we can see is that by using a little bit more of inventory we can really improve the overall performance – from 7.69 to 44.73% ROA or a 581.7% improvement.

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5. Noble Bicycles of Glen Arbor, Michigan, is a small batch manufacturer of high-end bicycles. That is, it typically builds bicycles in batches of one to three units. Quality is high, only to be expected when the typical bicycle frame costs $2,500 and up. Yet, profits have not kept pace with top management's expectations. Management has set a goal of generating a minimum of 25 percent return on assets. As a result of a corporate SWOT analysis, management has identified one critical threat: the costs at Noble are simply too high—and one important opportunity: because of the flexibility of operations and the experience of the design team, many of whom are either professional or serious amateur bicyclists, Noble is well positioned to become an innovation leader. A top management team consisting of the marketing director, finance director, the corporate vice president, the purchasing director, and the director of operations management has developed two alternative strategies: (1) focus on reducing costs through the application of lean systems and procedures (Chapter 8), and (2) focus on product innovation (Chapter 4). To assess the two approaches, the team generated the following table.

Category	Current Values	Lean Proposal	Innovation Proposal
Sales	$12,500,000	$12,500,00	$16,000,000
Cost of goods sold	$10,625,000	$9,375,000	$12,000,000
Variable expenses	$ 750,000	$ 650,000	$ 800,000
Fixed Expenses	$ 750,000	$ 600,000	$ 750,000
Inventory	$ 1,250,000	$ 900,000	$ 1,500,000
Accounts Receivable	$ 600,000	$ 500,000	$ 600,000
Other Current Assets	$ 600,000	$ 600,000	$ 750,000
Fixed Assets	$ 600,000	$ 600,000	$ 600,000

a. What is Noble Bicycles' current ROA?

Lets make things simple and just calculate the ROAs for the options using the supplied SPM excel template:

Category	Current Approach	Lean proposal	Innovation Proposal
ROA	12.30%	72.12%	71.01%

b. How does the lean proposal affect operations at Noble Bicycles?

Improves ROA primarily through cost savings

c. How does the innovation proposal affect Noble Bicycles (why)?

Improves ROA primarily through revenue generation

d. Which proposal would you recommend to top management? Why?

Strictly based on the numbers (ROA), we would recommend the Lean because it is slightly better. Yet, these two are essentially equivalent. The decision has to come down to strategy and the business model – how does the firm want to compete and what types of customers is it going after.

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e. How much of a change in sales would be required in order to make the returns of the two proposals equivalent?

Just slightly more than 150,000 increase in sales for the innovation option

f. What are the strategic risks of these proposals?

Lean proposal

- Nothing new for the customer to look at in terms of product.
- Assumes that the customers are price sensitive.
- Can reduce the responsiveness of the system through the reduction of inventories and slack (translates into lost sales).
- Tends to make the people more risk averse.
- Once you have achieved reduced costs, what else is going to attract the customer? In other words, we need to develop a strategy to follow up on the cost reduction strategy embodied in lean.

Innovation proposal

- You have to develop the products first and see if the market wants to buy them. There is always the risk that the market will reject our designs.
- Greater inventory levels.
- How to protect any intellectual property resulting from the new designs.
- We have to be prepared to increase output very quickly should we design a real "home run"- successful design (otherwise, the competition might copy us and produce essentially the same product at a lower cost).
- Forces Noble to continuously be innovative.

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Otis Trains Explores the Supply Chain Case – Teaching Note

To make the recommendations, it is first necessary to understand the product that Otis Trains is selling. It is selling high quality, detailed, small batch train sets that are targeted towards affluent males in the 30-50 age bracket. For this market, we can assess the Order Winners, Order Qualifiers, and Order Losers:

- Quality OW
- Price OQ
- Lead time (to delivery) OW/OL (if too long)
- Availability OQ
- Variety OW

From this analysis, it is evident that Price, while important, is not critical. In going to China, we are focusing on a solution that emphasizes cost. While important, it is not consistent with the requirements of the customer.

More importantly, we must consider that the supplier, being located in China, exposes Otis to a number of critical potential problems:

- Long lead times (due to shipping)

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- Problems with the supplier not understanding what makes for an acceptable product to the target customer (remember – the products that are being released have a great deal of significance to someone in the United States – the meaning of these same products might not be as apparent to someone not familiar with American history)
- Increased costs due to transportation and increased inventory.

Consequently, the decision does not make a lot of sense. Rather, it makes more sense to source the products from a company/supplier located in North America – here, you would have a supplier that could work closely with you and that would offer you, hopefully, short delivery lead times and high quality.

Assuming that Otis decided to accept this proposal, identify and discuss the most appropriate relationships and potential risks.

Here, because of the need for high quality products that are frequently updated to reflect new types of trains, the most appropriate relationship is a close collaborative relationship. Such a relationship is important because you want to work closely with the supplier to ensure that new products are designed and introduced quickly and with the appropriate levels of quality.

By outsourcing to China, we are faced with a number of potential risks:

- Quality problems – the products may not satisfy the desired levels of quality
- Delivery delay problems – because of potential delays caused by lack of shipping capacity, weather, problems at customs, or any production problems.
- Financial risk – the supplier experiences financial problems

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- Intellectual capital/creating a potential competitor – we wind up teaching JLPTC about how to build acceptable and desirable trains for the North American market; they decide to sell directly to the market at a lower price.

Otis could do several things to protect themselves:

- They could position some of their own people at JLPTC to ensure that the quality is acceptable.
- Inventories could be built up in North America or Otis could decide to ship the products by air.
- Otis could monitor or thoroughly assess the financial well-being of their suppliers.
- The last one – intellectual capital/creating a potential competitor – is the most difficult one to protect against. Otis could try to protect themselves by having JLPTC build an almost-completed product and then finishing themselves (to ensure that JLPTC does not have this final bit of knowledge); alternatively, Otis could buy out JLPTC.

Steinway and Sons Piano Case – Teaching Note

This case illustrates the potential problems that a firm can encounter when it tries to focus on manufacturing process improvement without constantly remembering the critical customer(s) and their requirements.

The discussion of this case can be carried out by first asking the class to evaluate the product and the customer. When talking about the product, we are dealing with World Class pianos. These are pianos that are played by concert pianists. They are also found in leading music schools, recording studios, concert halls, and in the homes of people who love excellent pianos. These are our critical customers. These people for whom the following trait assessment can be carried:

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Order Qualifiers: Price (these people are willing to pay a premium for a top grade product); lead time (they are willing to wait for the product)

Order Winners: Quality, variety (This issue is not immediately apparent to most students. The user of this product does not consistency. That is, they do not want each piano to sound the same. Rather, they want variations. These variations, which are the result of human expertise and knowledge on the part of the builders, are important because the different types of piano music have different traits and they require different sounds from a piano. The tone that you want from a piano used to play jazz are often very different from the tones that you look for a piano used to play Beethoven or Scott Joplin (ragtime). In addition, different pianists look for different sounds that reflect how they view the music. Some are looking for a bright sound while others are looking for a deep rich tone. These are some of the reasons that pianists spend so much time testing and trying out the various pianos. This is issue that consistency may become a liability is important because for many students, consistency is good. We want to have products are identical from unit to unit. Yet, for Steinway pianos, we want products that are consistent in quality of construction but have some variability in terms of tone quality.

Orders Losers: Poor quality, poor tone quality. See preceding discussion.

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The impact of the Process Improvements. In the case, we see two major changes taking place in the Steinway manufacturing process. The first is that the manufacturing process is becoming more automated. In fact, Steinway was considering the use of CAD/CAM (Computer Aided Design/Computer Aided Manufacturing) to improve the performance of its manufacturing process. This investment was driven by two factors – the need to reduce cost and the changing the nature of its workforce. This latter aspect is important because it is the second change process.

In the past, Steinway was dependent on the skill of its workforce. Yet, it is now becoming harder to find the skilled workforce – fewer people are being attracted to it (getting such skilled people requires people who both understand music and who have undergone extensive apprenticeship training). In fact, many American companies faced by this same challenge have turned to recruiting such people abroad (e.g., from Europe). Any people who can do the type of work required by Steinway will also be expense to recruit and to employ (they will ask for a higher salary/wage). The introduction of automated manufacturing can be viewed in part as a response to these problems with the labor force.

However, it is also important to understand the impact of automation on the existing labor force. This can be viewed as a challenge and threat to the current skilled workforce. Some may feel that they may be losing control over the process and the quality of the product. Consequently, some of the skilled workforce, so critical to the long-term success of Steinway, may decide that it is no longer worthwhile to work at Steinway and they can quit.

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This is exactly what is happening. The resulting changes are changing the nature of the manufacturing capabilities. These capabilities are better suited for building a consistent but lower quality instrument and an instrument where there is less meaningful difference in the music tone. These capabilities are drifting way from the requirements made by our critical customers.

Once this emerging gap has been identified, the next stage and the one that the students should now focus on that of how to close the gap.

In addressing this gap, it is important that the students begin by realizing that Steinway cannot really change the critical customers and their expectations and demands. These should be viewed as given. What this means is that we must now focus our attention on how to best change the capabilities.

While many recommendations can be generated, the students should recognize the following:

- Technology is appropriate for consistency. Consistency is important in the components. Consistency is not critical when it comes to the tone. We should use technology to free up our critical resource, the skilled craftspeople, to focus on developing the "right" tone and to ensure that the piano is quality in construction.
- We cannot eliminate the knowledge and expertise of the skilled craftsperson. This is what ultimately makes a Steinway a Steinway.
- We must make better and more appropriate usage of the skilled craftsperson.

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- Quality comes from the craftsperson. What this means is that we must ensure that a Steinway piano is allowed to go to the customer ONLY after a craftsperson says that it is ready. This ensures that the craftsperson sees themselves as being in control of the process and the product. This will encourage the craftsperson to stay and it will make the resulting manufacturing process more attractive as a place to work.

By making changes to the manufacturing process based on these considerations, the gap between the customer and the Operations Management capabilities should be closed.

Trail Frames Chassis – Teaching Note

Like the Steinway case, Trail Frames Chassis (TFC) represents a case where the issue is fit between the market and the Operations Management capabilities. With TFC, the challenge to the fit comes not from the manufacturing process (Steinway). Rather, it comes from the demands being placed on it by the introduction of a new, potentially attractive market segment. The bottom line with this case is simple – the new market segment that TFC is now pursuing is one that demands skills, equipment, and processes that TFC currently does not possess. Before beginning the analysis, it is important to recognize why TFC is pursuing this new market. The answer is a simple one and one that is not really adequate discussed in the case. TFC is faced by the need to grow sales so that it can grow profits. The management at TFC now feels that they have reached the limit of the growth offered by their current market and marketing strategy. Something new is needed and this something new is that of mass-produced RV chassis.

Customer Assessment

The first thing to do is to address the first question. The following are some insights that should come out of the customer analysis:

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Current Market

Order Winners: Flexibility; Variety; Responsiveness

Order Qualifiers: Price; Quality (top quality product expected); lead time

Order Losers: Lack of responsiveness; lack of flexibility; poor quality

Proposed Market

Order Winners: Cost (costs are the major drivers); lead time (fast is important because of the proposed volumes involved).

Order Qualifiers: Quality (expected); variety (important to note here that flexibility and responsiveness have very limited attraction to this new market segment).

Order Losers: High cost; long lead times; poor quality.

By comparing these markets, it becomes evident that the two markets have very little in common.

Consistency between the New Market and the OM Capabilities

What TFC is good at involves customization and flexibility in a low volume environment. Yet, what the new market wants and demands is that of cost reduction/control, standardization, and high volume production. Ramping up for TFC is more than simply than adding more equipment, people, and raw materials. Mass production of a standard product requires an entirely different infrastructure; it requires different scheduling tools; it also requires a different approach to product design.

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This was something that the management at TFC did not seem to appreciate. It cannot take an existing design and cheapening by using lower cost components. It tried to do so and it lost. Why? Because the cheapened chassis just would not work. The resulting quality was not acceptable and TFC paid for it.

This analysis works for questions 2 and 3 in the module.

Recommendations to John Stickley

There are two potentially equally valid approaches available to the student. The first is to recommend against this new option. That is, get out it as quickly as possible. Sell it to GM or Toyota and reinvest the sales proceeds into improving the current process or in identifying markets that might appreciate the capabilities offered by TFC. The second is to establish a separate organization focused around the new market. This organization would be separate and would be built from ground up with its own design staff, scheduling system, inventory control system, performance measures, and budget/accounting system. It would share very little with the existing organization.

If you decide to invest in the existing system, then you have to focus on two issues. The first is that of improving how well we can operate the current system (continuous improvement). The second is looking for new markets compatible with the existing capabilities.

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Lil' Me – Dealing with the Millions of Toys (MOT) Proposal Teaching Note

This is an interesting case that is grounded in reality – it is largely based on the My Twinn story. In this case, we see a company that is struggling in the short-term being approached by a proposal that appears both timely and highly attractive. It is attractive on several dimensions:

- Increase in volume
- Assurance of source of demand (size of Millions of Toys and its market presence)
- Interest shown in Lil' Me by Millions of Toys

By forcing the participants to lay out the current business model and then understanding the changes in the business model introduced by the Millons of Toys proposal, the participants should see that there is a fundamentally mismatch. More importantly, the process that works well for our current customers would NOT work well for the Millions of Toys customer. Ultimately, Lil' Me would have to make significant investments in its capabilities to meet the requirements of Millions of Toys. Unfortunately, in its current position, it has neither the time nor the financial capacity to do so.

1. What is your evaluation of the business model currently in place at Lil' Me?

As pointed out in this chapter, the business model consists of three major components: key customers, value proposition, and capabilities. Let's look at each.

- Key customers – parents and grandparents – looking for gifts (very seasonal in nature, with quality and price being order qualifiers, on-time delivery and flexibility being both order winners and order losers). There is also a new set of customers now emerging – collectors of these dolls. These people are looking for innovation (changes in product line due to the introduction of new products on a regular basis). They are also looking for post-sales support in the form of an extensive doll repair network. This latter issue should not be much of a problem for Lil' Me since this can be satisfied essentially by

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outsourcing (which is what Lil' Me is currently doing). As a group, these customers are fairly consistent.

- Value proposition focuses on issues such as innovation (design of new heads and dolls), responsiveness, and flexibility. In this setting, cost is a secondary, not primary driver.
- Capabilities – since we need flexibility and responsiveness, we need to think in terms of having systems have excess capacity, involving artists (to design the new heads), and that tend to be more manual than automated. In addition, we would expect to see close relationships between the designers and the manufacturing (since the new designs have to be rushed into production quickly). We also need a broad supply chain that embodies both production and post-sales support. These traits are currently present.

In short, if we look at the current business model, then we see a good fit.

2. What would the business model look like if we were to accept the MOT proposal?

The short answer – very different. Lets look at the components:

- Key customers – is now looking for very designs, more standard, and a greater emphasis on cost and cost management. What has happened is that cost has now become an order winner, not the order qualifier that it was previously.
- Value proposition – one that emphasizes cost and delivery. Issues such as post sales support are no longer important.
- Capabilities – must emphasize volume, cost reduction and speed. Ultimately, this means that Lil' Me has to think about investing in automation. This is an option that takes time, resources and new management skills.

As previously noted, a very different business model.

3. To what extent could the current business model service the needs of MOT?

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By the time that you have laid out the two business models next to each other, it should be very clear to the participants that the business models are very different and that the current one does not meet the needs of the MOT desired business model.

4. If there is a gap identified in question 3, what investments would have to be made to bring about alignment?

This question was essentially answered in question 2 – Lil' Me must invest in capabilities that emphasize volume, cost reduction and speed. Ultimately, this means that Lil' Me has to think about investing in automation. This is an option that takes time, resources and new management skills.

5. Does Lil' Me have the time to make the changes required by the MOT proposal?

In a word – no. It takes time to get the money, build the new facilities, hire and train the new staff, and debug the process to make that it works properly.

In short, while attractive, Lil Me should avoid the MOT proposal.

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