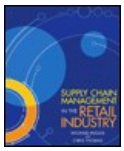


# Supply Chain Management in the Retail Industry

by Michael Hugos and Chris Thomas

# Chapter 8: Defining Supply Chain Opportunities

## Overview

As companies such as Wal-Mart and Dell have so clearly shown, if a retailer can design and build a supply chain that is responsive to market demands, it can grow from a small company to a world leader in its niche or industry. Efficient supply chain operations are central to being able to satisfy market demands and do so profitably. Where markets used to be shaped by the availability of product, now they are shaped by the evolving demands (some might say whims) of the end users or customers, who take for granted that whatever they want will be available, where and when they need it.

In this chapter, we take the market analysis framework created in Chapter 7 and use it to determine how and where a company can be successful in gaining market share based on identifying opportunities and risks. It also enables each company to focus on delivering value to the overall supply chain by providing “the right” goods and services with “the right” amount of flexibility. The chapter describes the following sequential steps:

- Determine the reasons to design, build, and/or improve a retail system.
- Create a strategy and the objectives needed to reach a goal.
- Estimate the budget needed for the system.
- Calculate the return on investment (ROI).
- Create a high-level project plan to guide the effort.

Now that technology enables conscious design and real-time management of a company’s supply chain, how does a company use this ability to its competitive advantage? A well-designed and -managed supply chain should enable the store to offer high levels of customer service while at the same time holding its inventories and cost of sales to levels lower than its competitors—in other words,
it should be taking full advantage of the opportunities the supply chain offers. This chapter introduces a process to use for defining these opportunities within a supply chain.

## Identifying Opportunities

Supply chains that deliver the best value to their end use customers generate a strong demand for their products and services. They are good places for producers, logistics providers, distributors, and retailers to do business. The efficiency of the entire supply chain greatly affects each company’s ability to prosper, so standards of performance evolve in these supply chains over time. Typically, new companies cannot enter the chain unless they can meet these standards. This means that companies who are good at their core supply chain operations work together in self-selecting supply chain partners that can help deliver the greatest value to the consumer.

Retailers can benefit greatly from systems that include stronger technological links in their supply chains. *Retail Merchandiser* magazine and its sister publication, *Apparel,* have identified a few key segments of the clothing industry that are excellent examples of areas in which retailers and suppliers can improve their visibility to each other, lower costs, get products to market more quickly, and/or improve their decision-making abilities:

- **Design and product development.** Systems for product data management (PDM) or product life cycle management (PLM) allow users to save and manage ideas, materials, and data in one place so that they may be accessed by everyone involved in the creation of new products.
- **Color development and management.** Any type of product that comes in a range of colors (cosmetics, apparel, and many others) must ensure that the selected hues are clear and correct throughout the supply chain, from initial design to raw materials to finished product. Sears is one company that does spectral evaluations of submissions and saves results in a database so they can be tracked exactly.
- **Logistics.** In the garment trade, different items within the same designer’s collection may be coming from different countries. Good third-party logistics (3PL) providers are prized for their ability to track items from origin all the way to the store.
- **Product identification.** This includes label information in multiple languages: care instructions, vendor and style numbers, and accurate packing information on cases and cartons that will not cause slowdowns in Customs.

- **Warehouse management.** The biggest buzz in retail warehouses is the fast-growing use of **radio frequency identification (RFID)**, which we'll discuss in greater detail in Chapter 10. But any system that allows greater visibility into the supply chain by automating processes like cross-docking, picking, packing, shipping, returns, and damage control in a warehouse has the potential for substantial savings of time and money.[1]

What do these pursuits have in common? They are all systems, created and deployed within a supply chain with goals of making the chain more efficient.

Supply chain opportunities generally fall into two categories, and the type of opportunity determines the way the company should go about accomplishing its goal:

- The first category is to fix or improve something already in place. If you are pursuing an opportunity that is in the "fix or improve something already existing" category, then use Goldratt's Theory of Constraints (introduced in Chapter 6) as the guidelines for taking action.
- The second category is to create or build something new. If you are going after an opportunity in the "build something new" category, then use the process outlined in this chapter.

First, what is the goal? The key areas mentioned for the apparel industry, for example, didn't become "key" overnight. Someone in a supply chain decided they were areas worth improving by creating new, better systems. A market creates a demand for a bundle of products and services to support it, and companies step up to provide them. So there are plenty of questions to be asked when a retailer decides to actively seek new (or greater) opportunity within the supply chain: What are the markets the company serves and who are the end use customers? Who are the producers in these markets? Who are the distributors, logistics providers, and other partners? What are the products and services demanded by this market?

What is the supply and demand situation in these markets? Use the market analysis framework in Chapter 7 to determine which market quadrants the company deals with—not just today but two years from now. Then, compare the organization with its major competitors in the market. Who leads the pack, equals, or lags behind in the four categories of performance: customer service, internal efficiency, demand flexibility, and product development? Should this particular retailer be trying to lead, equal, or excel in each of these areas? The answer is not necessarily to excel at all four—realistically, it is almost impossible to do so. But a position *can be identified* in each of the four areas, depending on the demands of the markets the retailer serves.

For example, as we mentioned in Chapter 7, a company must lead in flexibility if its target markets are mature, or it must lead in customer service if its markets are growing, and so on. The performance targets of Chapter 7 define the goals here in Chapter 8. They become the measures of success.

### Creating a Strategy

Once a business goal is defined and the performance targets are set, the next step is to create a strategy to move forward. Simply defined, strategy is "the use of means to achieve ends." In other words, a strategy uses the business operations (means) of an organization to achieve its goals (ends).

To define each strategy, begin by looking at the five basic supply chain operations that are performed in the company—plan, source, make, deliver, and return. Achieving the performance targets will require improvements in one or more of these operations.

Now it's time for the fun part. Brainstorm to generate ideas for each of the five categories. Ask the question, "What seems impossible to do—but if it *could* be done, would dramatically change the way this company does business?"

Look for ways to change the business landscape, to give a retailer a significant competitive advantage by doing something new and different. If nothing absolutely "new" comes to mind, look for ways to significantly improve existing operations to get greater performance and better cost savings from them. Better efficiencies in existing operations will rarely provide huge business wins, but they will certainly help ensure the company's survival.

These ideas are the raw material from which the business strategy will emerge—and the longer the list, the better. Review the finished lists for each operation, and select three to six of them that seem to have the most impact, either because they promise the greatest payback or have the highest likelihood of success without too much complexity. These are the ideas that must now receive further attention. They will be the foundation upon which the strategy is based. See Figure 8-1 for a look at how the company of one of this book's coauthors set its goals using this system.

| | BUSINESS OPERATIONS / PERFORMANCE CATEGORIES | CUSTOMER SERVICE<br>As measured by: Fill Rate; On-Time Delivery; Product Returns | INTERNAL EFFICIENCY<br>As measured by: Inventory Turns; Return on Sales; Cash-to-Cash | DEMAND FLEXIBILITY<br>As measured by: Cycle Times; Upside Flex; Outside Flex | PRODUCT DEVELOPMENT<br>As measured by: New Prod Sales; % Revenue; Cycle Time |
|---|---|---|---|---|---|
| PLAN | Demand Forecast | (X) | × | (X) | |
| | Product Pricing | (X) | × | | |
| | Inventory Management | × | × | × | |
| SOURCE | Procurement | | × | × | |
| | Credit and Collections | (X) | × | | |
| MAKE | Product Design | × | | | × |
| | Production Scheduling | | × | × | |
| | Facility Management | × | × | | |
| DELIVER | Order Management | (X) | × | | × |
| | Delivery Scheduling | × | × | | |
| RETURN | Timing | | (X) | | |
| | Refund and Replacement Policies | (X) | | | |
| | Satisfactory Complaint Resolutions | × | × | | |

Network Services set a goal and performance targets that called for improvements in the categories of customer service and demand flexibility. To excel in these two categories, Network Services Co. had earlier made major improvements in its credit and collections operations. Next, it decided to improve its demand forecasting, product pricing, and order management operations.

**Figure 8-1. Improve selected business operations to meet performance targets.**

The team must examine this handful of promising ideas that have been selected, and a little more brainstorming is in order:

- How will these ideas play out over the next few years? How do these ideas work together to help take the organization from where it is now to where it wants to go?
- What tasks must be assigned, and what new operating procedures and information systems must be created, in order to carry out these ideas? What's the best guess for how much time this will take?
- Look to see how these ideas relate to each other. Does the implementation of one idea build upon the implementation of a previous idea? What sequence should be followed in the implementation of these ideas?
- What kind of changes in operations, technology, and staffing are called for to implement each idea, and how can these changes be done in a manageable way?
- How can the implementation of these ideas be broken up into phases that can each be completed in three to nine months? A phase needs to create deliverables that provide value in their own right and that can be put to use as soon as the phase is completed. Figure 8-2 shows the two-year plan for Network Services' development strategy as an example.

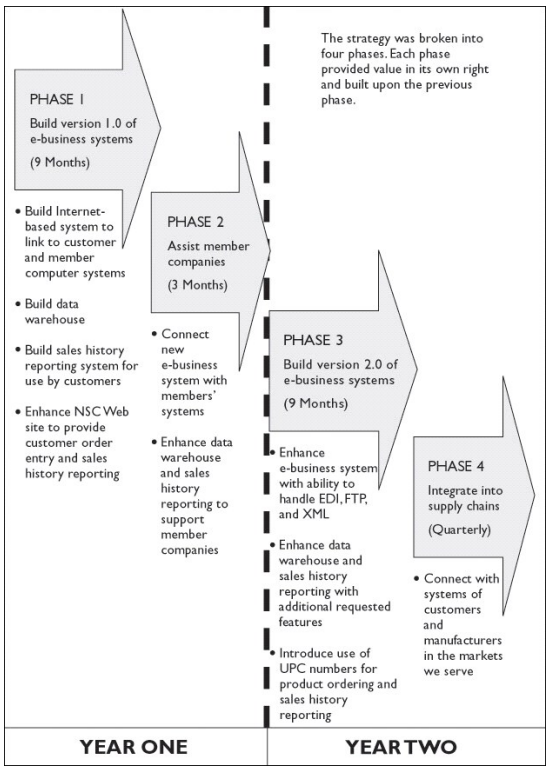



**Figure 8-2. Network Services development strategy.**

It is important to see the big picture that stretches over a period of several years but also to segment the big picture into smaller phases, so the company is able to begin receiving tangible benefits from its work in a relatively short time period. It can also respond to new developments in the business environment in a timely manner by adjusting its strategy as necessary as each phase is completed. There is a saying that sums up this approach very nicely: “Think big, start small, and deliver quickly.”

## Designing Systems

The strategy to achieve the business goals is expressed in a **conceptual design**, which is a fairly simple diagram of a system or set of systems. Several different conceptual designs should be created for systems that will meet the desired performance criteria, using simple shapes (like cubes, cylinders, and spheres) to represent different components of the design. Connect these shapes with lines and arrows to show the direction of data flow and activity.

The point with a conceptual design is to illustrate a high-level concept. There’s no need to get too technical or detailed in these diagrams; their purpose is to quickly communicate the basic structure of the proposed design. And, like any other “artist’s rendition,” there is an order to creating a useful design. Follow along on Figure 8-3.

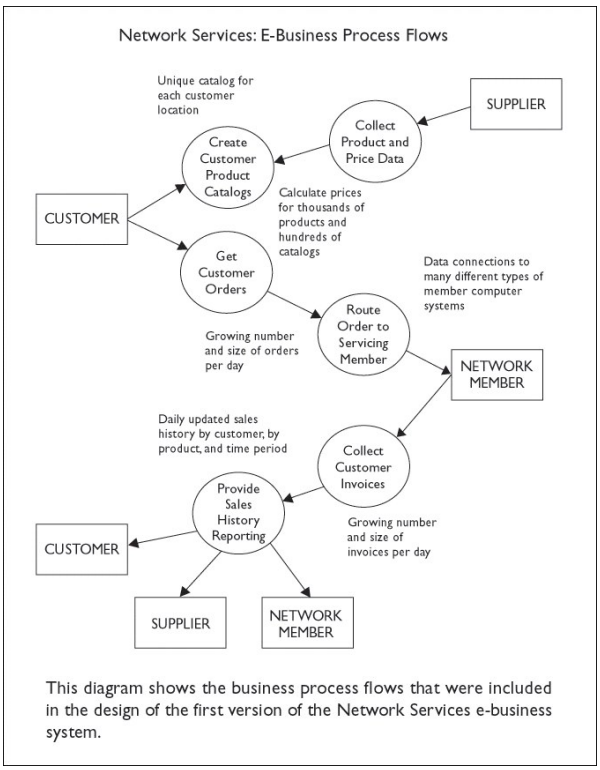



**Figure 8-3. Diagram of the business process flows.**

- First, approach it from the perspective of the business processes that are supported. Sketch out the different operations that are performed, and note the kind of information that is required by, and created by, each operation.
- Then add further definition to these process flows by specifying the data flows into and out of each operation. In each case, estimate the volume and frequency of the data flow, as well as the source and destination of each data flow. In addition, for each operation, define the types of people (if any) who will perform this work. How many people will there be? What are the skill levels of the different types of people?
- Next, decide which operation will be automated, which will be manual, and which will be part automated and part manual. As a rule, people like systems that automate the routine and repetitive tasks, thereby empowering the people to do the problem-solving and decision-making tasks more effectively.

People really are the most valuable resource of any company, so design systems that make maximum use of their skills. Technology's role is to support the people who use it, not the other way around.

However, be sure to evaluate the existing computer system's infrastructure in place in your organization and look for ways to build on it. The most cost-effective systems are those that deliver valuable new capabilities to an organization, quickly and with a minimum of effort. Select the simplest combinations of technology and business processes that meet the specified performance criteria. Balance the need for simplicity with the ability to increase the capacity of the system to handle greater volumes of data and to add new functionality as the business operations grow in volume. Keep the focus on building a supply chain infrastructure that is flexible enough to adapt to the needs of the markets the company serves as they change. Do not design a system that locks the company into one way of operating and that is not capable of evolving to support new operations.

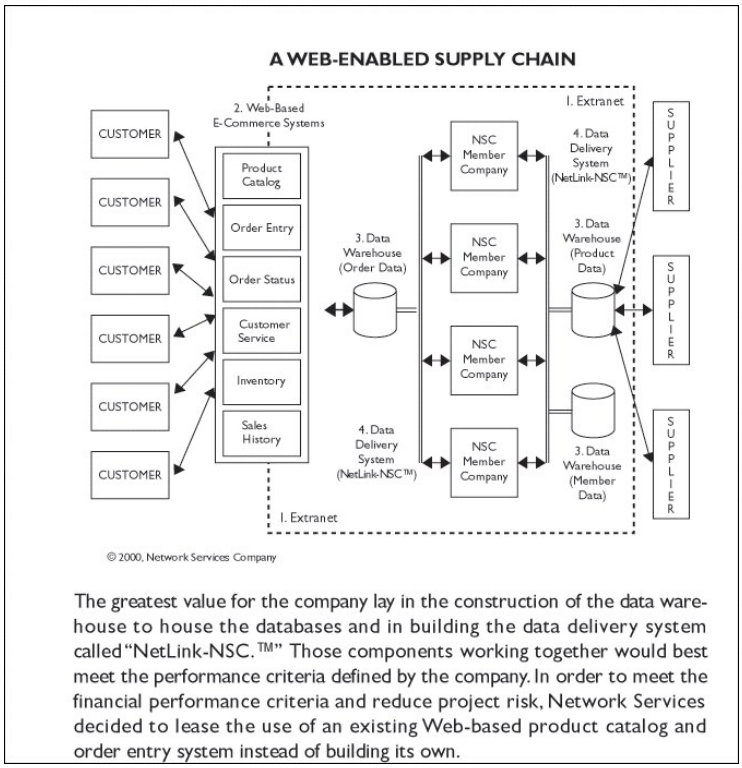
The conceptual design diagrams are invaluable in communicating the features of the different designs clearly and simply to a wide audience of people. Reviews and comments should be sought from people who will use the new system, people who will pay for it, and people who will build it. Thoughtful input from a variety of sources is very helpful in selecting the best design, and adjusting it based on the feedback to increase the likelihood that it will succeed.

## An Example of a Conceptual Design

Network Services Company selected a conceptual design for its e-business systems infrastructure to allow the company to meet its performance targets. This design was one of several presented to an audience that ranged from the board of directors to senior management, to the people who would build the systems infrastructure, and to the people who would use the systems. Feedback from each group contributed to the final design, shown here as Figure 8-4.

In this schematic, four main components work together to provide a flexible and cost-effective infrastructure that can change as business conditions evolve and can handle greater volumes of data as business operations grow. The four main components are as follows:

- **The extranet.** A high-speed, Internet-based network to provide all member companies with a secure environment in which to exchange information and work together to serve national accounts.
- **Web-based eCommerce systems.** A suite of systems accessed via the Network Services Web site. A packaged system from an application service provider (ASP) is used to provide order entry, inventory, and order status. Network Services provides the sales history reporting system. This suite of eCommerce systems is also available to member companies to serve their local customers.




The greatest value for the company lay in the construction of the data warehouse to house the databases and in building the data delivery system called "NetLink-NSC.™" Those components working together would best meet the performance criteria defined by the company. In order to meet the financial performance criteria and reduce project risk, Network Services decided to lease the use of an existing Web-based product catalog and order entry system instead of building its own.

**Figure 8-4. A sample conceptual design.**

- **NSC data warehouse.** A collection of databases to support the Web-based eCommerce operations and internal NSC operations, such as proposal development, price file maintenance, account book creation, and sales reporting.
- **Data delivery system (NetLink-NSC™).** A two-way, Internet-based data transfer system to allow each member company's internal systems to read and write data in a common format to support delivery of seamless and consistent national account service. This component incorporated and reused software from an earlier system that provided for receipt and error checking of invoice data from member companies.

**[1]Jordan K. Speer, "Supply Chain Links," *Retail Merchandiser*, a publication of Schofield Media Ltd., Chicago, Illinois, May 2004.**

## Combining System Design And Strategy

Designing supply chain systems, or any other kind of in-store system, can quickly become a very complex undertaking. The business manager can feel overwhelmed by the choices and be tempted to leave this activity to the technical experts. Our advice is this: Do not give in to this temptation! Retail managers need to remain actively involved with the technical people in creating the conceptual design for the system—it's the only way to truly ensure that the system aligns with the strategy that the company requires to accomplish its goal. The retail manager's input is needed to think through the steps required for the process; the technical staff then should be able to provide the technical expertise to design and build it. Together, the initial high-level design may be sketched out and fine-tuned.

In fact, it is wise for retailers and their IT staff to generate a number of possible conceptual designs. Some will eventually "fly," and others will be discarded. There are some simple, reliable guidelines for determining the quality of a new system design. A design that respects *all seven* of these guidelines is the best. It may still be a workable design if one or two of these guidelines are violated (as long as it is not # 1). But if guidelines are violated, there must be very good reasons for doing so, and specific compensations must be made to cover those violations.

If three or more guidelines are broken, then the conceptual design is seriously flawed and it is very unlikely that the design can be successfully built. The seven system design guidelines are as follows:

1. Closely align system designs with the business goals and performance targets they are intended to accomplish. For any systems development project to be a success, it must directly support the organization to achieve one or more of its goals. No new system can be effective until a business opportunity is clear that makes the system worth building. And no new system will bring a sustained benefit to a company unless it supports the efficient exploitation of the business opportunity it was built to address.

2. Use systems to change the competitive landscape. Here's that key question again: "What seems impossible to do today, but if it could be done, would make positive, fundamental changes in what the company does?" Put yourself in your customers' shoes or, as Nordstrom puts it, decide what would "surprise and delight" the customers. Look for opportunities to create a transformation or value shift in the market. Find ways to do things that provide dramatic cost savings or productivity increases. Then place yourself in a competitor's shoes and think of what course you could take that would be the least likely to be foreseen, quickly countered, or copied. In retail, as long as you are able to do something of value that your competitors cannot, you have an advantage. If you are going to take bigger risks and incur larger costs to develop a system, make sure it is a system that will change the competitive landscape. In reality, it's the only kind of system that can deliver benefits to justify the greater risks and costs.

3. Leverage the strengths of the existing system's infrastructure. When existing systems have proven over time to be stable and responsive, find ways to incorporate them into the design of new systems. Part of good strategy is using the means available to the organization to best accomplish its goals, and the design of a system is the embodiment of the strategy being used. Think of it as a type of evolution, building new systems on the strengths of older systems. New systems provide value only insofar as they provide new business capabilities. Time spent replacing old systems with new systems that do essentially the same things will not, as a general rule, provide enough value to justify the cost.

4. Use the simplest possible combination of technology and business procedures to achieve the maximum number of performance targets. From a practical standpoint, this increases the probability that at least some performance targets can actually be achieved. Simple combinations of technology and business process reduce the complexity and the risk associated with the systems. If you use the same technology to achieve several different objectives, it is also much easier to shift people from one objective to another as needed because the skill sets used are the same. There is no need for a completely separate system to meet each performance goal.

5. Break the system design into separate components or objectives, and as much as possible, run the work on individual objectives in parallel. Try not to make the achievement of one objective dependent on the prior achievement of another objective, to avoid bottlenecks and slowdowns in the development process. Use people on the project who have the skills to achieve a variety of different objectives. Your project plan should foresee and provide for an alternative plan in case of failure or delays in achieving objectives as scheduled. The design should be flexible enough to delete some system features if needed and still be able to deliver solid value to the business.

6. Do not try to build a system whose complexity exceeds the organization's capabilities. When defining business goals and the systems to reach those goals, aim for things that are within your reach. Set challenging goals— not hopeless goals. Don't exhaust the confidence of your team as they strive to meet a goal that is, in fact, unrealistic.

7. Do not renew a project using the same people or the same system design if it has already failed once. Redoubling effort is not reason enough to take another run at it. The new approach must clearly reflect what was learned from the previous failure and offer a better way to achieve the business goal and performance targets.

## Define the Project Objectives

You may have observed that defining the high-level components in a conceptual design is a somewhat subjective process, because there are many possible ways to design a system—some better than others. What makes for an outstanding design is to define high-level components that are highly cohesive in the functions they perform. This means each component performs a set of tasks that are all closely related to a single, well-defined activity.

For instance, a highly cohesive component in a conceptual design could be an order entry system. It does all the things that are required for a customer to enter an order. And that's all it does—nothing more. A component that is *not* cohesive would, for example, do order entry and also manage a database of sales information and route orders to different business locations. Showing all those activities as one component in a schematic design does not provide enough *definition of the design* to enable people to evaluate it effectively. In fact, it could be confusing. In this case, it should be broken down into three separate components—one for order entry, one for database management, and one for data transmission.

The building of each high-level component means defining a set of specific, measurable activities or objectives that must be achieved in order to create a system. There are generally somewhere between three and nine high-level components, and all other components will resolve into subcomponents of these high-level components. Why only three to nine high-level components? Because most of us are just regular folks and it would be difficult to remember or follow more than seven (plus or minus two) things at a time. A clear, simple system design goes a long way toward ensuring the success of the project because the people involved with it can understand it.

Without a clear conceptual design, the people involved with building, using, and paying for the system will all have different ideas about what the company is trying to accomplish. People working on the different parts of the system will find it increasingly difficult to coordinate their actions. The levels of tension and misunderstanding may increase as the work continues.

The development of each component in the system design becomes an objective in the project to build the system. Similar to the way that a long-term strategy is broken down into self-sufficient phases that each provide value in their own right, the building of a new system should be broken down into a set of objectives that each provide value in their own right. An objective should not be just an intermediate step along the way that depends on the completion of some future step to be of value. Each objective should each be achievable within a timeline of three to nine months—or less, in some cases. The more quickly an objective can be achieved, the faster it will begin providing value (and repaying the cost of the project) before it is even entirely finished.

Also be careful not to define objectives that lock the project into some rigid sequence of development activities. The world rarely goes according to plan, so the plan must be flexible in order to adapt as reality unfolds. Begin work on as many objectives as possible simultaneously. As much as possible, make the tasks needed to achieve each objective independent of the tasks needed to achieve the other objectives. The reason for this is maximum flexibility—if one objective is delayed, it will not also delay the completion of others. Resources can then be shifted from one objective to another as needed to respond to situations that arise.

### Initial Project Plans and Budgets

It is always a challenge to create a project plan early in the game, when there are so many things that are not entirely known. There will be much agonizing and grumbling about the plan, so be prepared for it. People will gripe that they are being asked to commit to something they know very little about, or they worry that whatever they say will come back to haunt them. In an attempt to give themselves as much "wiggle room" as possible, some will create plans that are so high level and vague they are little more than smoke screens. Others will plunge into the task with determination and produce a plan showing minute detail—about things that can hardly be defined yet! These plans amount to wishful thinking about a future that will probably be nothing like what is shown.

How can these natural tendencies be avoided? Let's start with a definition. Simply stated, a plan is a sequence of nonrepetitive tasks that lead to the achievement of one or more predefined objectives that do not yet exist. A plan should not be confused with an operating schedule, which is a repetitive sequence of tasks that perpetuate an already existing state of affairs. This means that the plan should focus on laying out the tasks that need to be performed to achieve each objective that was identified in the conceptual system design. Do not clutter the project plan with repetitive tasks related to ongoing administrative or business operations.

Create a section of the overall project plan for each objective, listing the major tasks needed to achieve that objective. There will be tasks related to designing, and then building, the deliverables necessary for each objective. Show the dependencies between the tasks related to an objective, and show the dependencies between the objectives.

When estimating how long each task will take, remember the old saying that "any job will expand to fill the time available." Use a technique called **time boxing** to define the time limits for each task, a type of trade-off between the work involved in carrying out a task and the time that is available. Realistic and adequate time periods must be assigned to each task, and then it is up to the people doing the work to tailor the job to fit the time that is allocated. When setting these time boxes, get input from the people who will be asked to do the work. In a good plan, the time boxes for each task are aggressive. They require people to work hard and stay focused, but they should not be so aggressive as to make them feel they have no

chance of getting the work done.

A useful way to think about the work on a project is to divide time spent on it into three main steps and assign an overall time box to each of the main steps. Then, within each step, subdivide the time available to accommodate the tasks involved. The three steps and their durations are as follows:

1. Define what will be done—the goal and the objectives. (2 to 6 weeks)
2. Design how it will be done—the detailed specifications. (1 to 3 months)
3. Build what is specified. (2 to 6 months)

For each objective, set a time box for the design step and the build step. Don't worry about the define step—that's what you are doing right now, and showing it on the plan is not necessary. Look at the tasks required to achieve each objective. For example, let's say that Objective A has a one-month time box for design and a two-month time box for build. Decide which tasks fall into the design step and which tasks are in the build step. Allocate the time available in design among the tasks involved, and do the same for the tasks in the build step. You have now subdivided the larger design and build time boxes for Objective A into smaller time boxes for the tasks that are involved.

Figure 8-5 is a sample based on the Network Services' project plan. Assigning time boxes is an iterative process. It involves adjusting both the time allocations and the scope of the work to be done. It will probably take several passes through the plan before you have something that seems reasonable—that is, aggressive and yet still doable.

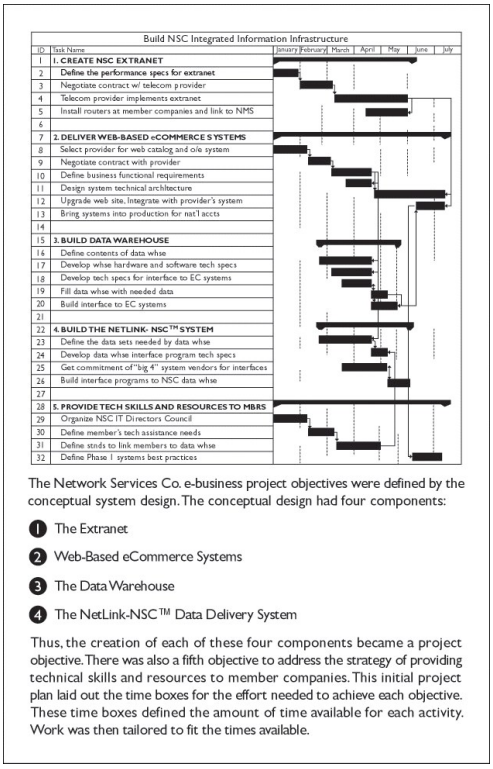



**Figure 8-5. How to create an initial project plan.**

## Estimate the Budget and ROI

At this point, the team must answer one of the most fundamental questions about the project: "Is this worth doing?" At first glance, you'd assume it was worth doing or you wouldn't have gotten this far . . . right? However, only after the design and plan have been constructed can the budget be created. And only the budget can estimate the true "worth," financially speaking, of what seems to be a pretty good idea.

Project plans and budgets are just two sides of the same coin. Plans show the time, people, and materials needed to get things done. Budgets show the cost of the people and materials over the time frames involved. In many cases, the cost and benefits related to a project cannot be defined with absolute certainty, but it is still valuable to get as accurate an estimate as possible.

The value of budgeting comes in two areas. The first is an opportunity to create a consensus among the people who have to pay for the system. Everyone whose budget will be affected by the project should have an opportunity to review the costs and benefits of the project. It is often hard to assign specific monetary values to the benefits, but it must be done. When in doubt, understate the benefits—just make sure that the benefit numbers are ones that people can understand and support. The sum of these benefit numbers is the value of the project, and it is very important to have agreement on the value of a project.

The value of the project is the main reference point to keep in mind when evaluating the rest of the project. The value of the system is what tells you how much can be spent to build the system. If the costs to develop a system add up to more than the benefits that will be produced, there are two choices: Find a less expensive way to produce these benefits or don't move forward with the project. Businesses exist to make a profit, and that is a discipline that all businesspeople must live with.

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### Supply Chain Skills—Realistic Cost-Benefit Analysis

Analysis of any project's costs and benefits calls for a company's financial executives to exercise judgment based on experience and industry norms. Network Services' CFO Bob Mitchum shared his thoughts about the costs and benefits of his company's e-business system design, seen in Figure 8-4: "First of all, I use a 12- to 18-month time frame for the analysis and I need to see an attractive payback in that time. If you accept a three- to five-year payback period, you are probably using the analysis to justify what is really an emotional decision. Beyond 18 months, the world changes in ways you cannot predict and I don't think you can effectively estimate numbers that far out."

Mitchum says costs are usually easier to estimate than benefits, but a realistic estimate of benefits is very important nonetheless. "Look at the tangible benefits and try to assign some numbers over a period of time. Then look at other intangible benefits, such as reputation and relationships with customers and suppliers. Look at employee productivity and leveraging their talents.Who are the stakeholders? What are the alternatives to doing the project and getting the same benefits?

"When I looked at the design and the cost benefit analysis for the e-business systems infrastructure for Network Services, I saw a couple of things. We knew that not many national accounts were going to use our order entry system to key in orders—they have their own systems. But unless we could check off a box on a checklist that said, yes, we have a Web-based ordering system, we wouldn't make it past the first cut in their screening process. So in the system design, we proposed to use an application service provider to deliver that feature on a pay-as-you-go basis.

"The real benefits came from electronic communications between us and the members, and that was where the bulk of the proposed budget was going to be spent. These communication links would make us stronger as a core group. The investment would strengthen the organization. The conceptual design met our basic needs and provided the most cost-efficient way to do so. The price tag was much lower than the price of the other options that were presented."

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## Defining Specific Costs and Benefits

From a financial perspective, a system generates a stream of costs and benefits over the length of time in which it is built and used. As a rule, a system should pay for itself and return an appropriate profit within one to three years. Generally after that, the system will require major enhancements, from routine upgrades to complete redesign. Specific benefits, and their dollar values, must be identified.

**ITEM PRICING SYSTEM—TOTAL ESTIMATED COSTS AND BENEFITS**

**Project Description**

Build system to assist staff of account development group to more quickly create contract proposals and explore impact of different product cost and pricing structures. Monitor status of existing contracts and provide notice before cost supports expire.

**Project Cost and Benefits** (Dollars in Thousands)

| | Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 | Qtr 5 | Totals |
|---|---|---|---|---|---|---|
| Hardware and Software | (7.0) | | | | | (7.0) |
| Development Costs | (68.5) | | | | | (68.5) |
| Operating Costs | 0.0 | (1.2) | (1.2) | (1.2) | (1.2) | (4.8) |
| **Total Costs** | (75.5) | (1.2) | (1.2) | (1.2) | (1.2) | (80.3) |
| Direct Benefits | 0.0 | 8.4 | 8.4 | 8.4 | 8.4 | 33.6 |
| Incremental Benefits | 0.0 | 30.0 | 30.0 | 30.0 | 30.0 | 120.0 |
| Cost Avoidance Benefits | 0.0 | 18.2 | 18.2 | 18.2 | 18.2 | 72.8 |
| **Total Benefits** | 0.0 | 56.6 | 56.6 | 56.6 | 56.6 | 226.4 |
| Net Benefits | ($75.5) | $55.4 | $55.4 | $55.4 | $55.4 | $146.1 |
| Cumulative Benefits | ($75.5) | ($20.1) | $35.3 | $90.7 | $146.1 | |
| Discount Rate | 5% | (5% per Qtr. = 20% Annual Discount Rate) | | | | |
| **Net Present Value** | 60.6 | | | | | |

**Detailed Schedule of Costs**

**Cost of Hardware and Software** (Dollars in Thousands)

| Item | Description | Cost |
|---|---|---|
| Application Server | Server to run the system—allocate 1/3 of server cost | 3.0 |
| Personal Computers | PCs for use by staff—allocate 1/3 of cost | 3.0 |
| Visual Basic language | Allocated cost of VB programming language and tools | 0.5 |
| SQL Server database | Allocated cost of SQL Server and tools | 0.5 |
| **Total** | | $7.0 |

**Cost of Development** (Dollars in Thousands)

| Task | Description | Cost |
|---|---|---|
| Define Phase | 5 days at average cost of $900 per day | 4.5 |
| Design Phase | 15 days at average cost of $900 per day | 13.5 |
| Build Phase—Coding | 30 days at average cost of $900 per day | 27.0 |
| Build Phase—Test and Train | 30 days at average cost of $650 per day | 19.5 |
| Build Phase—Roll Out | 5 days at average cost of $800 per day | 4.0 |
| **Total** | | $68.5 |

**Cost of Operation** (Dollars in Thousands)

| Activity | Description | Cost |
|---|---|---|
| Qtr 1 | | |
| Qtr 2 | Incremental costs of operating the system | 1.2 |
| Qtr 3 | Incremental costs of operating the system | 1.2 |
| Qtr 4 | Incremental costs of operating the system | 1.2 |
| Qtr 5 | Incremental costs of operating the system | 1.2 |
| **Total** | | $4.8 |

**Detailed Schedule of Benefits**

**DIRECT BENEFITS (revenue and cost savings due to productivity improvements)**

Direct Benefit 1 — Save staff time on proposal creation; 10 proposals per Qtr.; 20 Hrs. per proposal; $35/Hr.

Direct Benefit 2 — Do 2 additional proposals per Qtr.; 20 Hrs./proposal; $35/Hr.

**Value of Productivity Improvement** (Dollars in Thousands)

| | Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 | Qtr 5 |
|---|---|---|---|---|---|
| Save time on proposals | | 7.0 | 7.0 | 7.0 | 7.0 |
| Do 2 additional proposals | | 1.4 | 1.4 | 1.4 | 1.4 |
| **Total Direct Benefit** | $0.0 | $8.4 | $8.4 | $8.4 | $8.4 |

**INCREMENTAL BENEFITS (benefits due in part to new system, e.g., attract new customers, make better decisions, etc.)**

Incremental Benefit 1 — Win more proposals due to better pricing decisions; $30,000 per Qtr. in additional profits

Incremental Benefit 2 — —

**Value of Incremental Benefits** (Dollars in Thousands)

| | Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 | Qtr 5 |
|---|---|---|---|---|---|
| Win more proposals | | 30.0 | 30.0 | 30.0 | 30.0 |
| Incremental Benefit 2 | | — | — | — | — |
| **Total Incr Benefit** | $0.0 | $30.0 | $30.0 | $30.0 | $30.0 |

**COST AVOIDANCE BENEFITS (savings related to growing business without needing to add new staff or incurring other expenses)**

Cost Avoidance 1 — Avoid hiring more staff as business grows; half a person per year; $35/Hr.

Cost Avoidance 2 — —

**Value of Cost Avoidance** (Dollars in Thousands)

| | Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 | Qtr 5 |
|---|---|---|---|---|---|
| Avoid hiring more staff | | 18.2 | 18.2 | 18.2 | 18.2 |
| Cost Avoidance 2 | | — | — | — | — |
| **Total CA Benefit** | $0.0 | $18.2 | $18.2 | $18.2 | $18.2 |

**INTANGIBLE BENEFITS (benefits that are hard to quantify in dollar amounts but that should be identified and listed)**

**Maintain Competitive Advantages**

- Item Pricing system should be a competitive benefit for next 2 yrs.
- After that, it will simply become a necessary tool to do business

**Provide Superior Service Levels**

- Provide customers and prospects with timely and accurate proposals

**Increase Job Satisfaction**

- Release staff from tedious and time-consuming pricing calculations
- Allow staff to focus on more valuable and interesting work

**Figure 8-6. Sample cost-benefit analysis.**

Measure system costs and benefits on a quarterly basis. Subtract costs from benefits to arrive at the quarterly cash flow generated by the system. Calculate the value of that cash flow using whatever method the financial decision makers in the company would like (net present value, internal rate of return, etc.). The higher the risk involved in building and operating the system, the higher the profit that it should generate.

## System Costs

In a system development project, there are three types of costs:

1. Hardware and software costs for the technical and communications network components to be purchased from

vendors for the new system design.

2. Development costs as estimated by the time and cost needed to achieve each project objective. Each task that is part of the work plan for an objective will require some number of people with certain skills for some period of time. Each task will also require certain technology and perhaps other expenses, such as travel for some employees. Set a standard cost for each type of labor involved, and estimate the related expenses for each type of labor, for each step in the system development process: the “define” step, the “design” step, and the “build” step.

3. Operating costs have a number of components. Estimate labor expenses for the types of jobs to be filled for the ongoing operation and support of the new system. Estimate the line charges and usage fees for the communications network and technical architecture used by the system. Obtain yearly licensing and technical support costs from vendors of the hardware and software components used by the new system.

### System Benefits

There are four types of benefits provided by a new system:

1. *Direct benefits* are productivity increases and cost savings due to the capacity increases brought about by a new system. Define the new functions the system provides that the company does not now have. Estimate the productivity increases and labor savings that these new features provide.

2. *Incremental benefits* are monetary benefits that may not be solely a result of the new system but are measurable and due in some significant degree to the capabilities of the new system. This may be an increased ability to attract and retain new customers and the extra revenue that generates. It may be the new system’s ability to help the company avoid bad decisions, or to manage and plan for certain business expenses and the reduced costs that result.

3. *Cost avoidance benefits* are savings related to the increased capacity provided by the new system and the company’s ability to grow the business without having to hire new staff, or hiring fewer new people than would otherwise be the case.

4. *Intangible benefits* are hard to quantify monetarily but should be identified and listed nonetheless. These benefits include such things as a competitive advantage through better intelligence and adaptability, superior service levels that solidify customer relationships, and leveraging the abilities of talented employees and increasing their job satisfaction.

On paper or on a spreadsheet, a cost-benefit analysis can be intimidating until you understand the reasons for the figures—assigning a monetary value to each and every step of the process to create a new system. Take a look at the sample analysis in this chapter (Figure 8-7), and follow it through based on the steps we’ve discussed. In the real world, the senior business executive or management group responsible for accomplishing the business goal that the system will address must confirm that the cost-benefit analysis is valid.

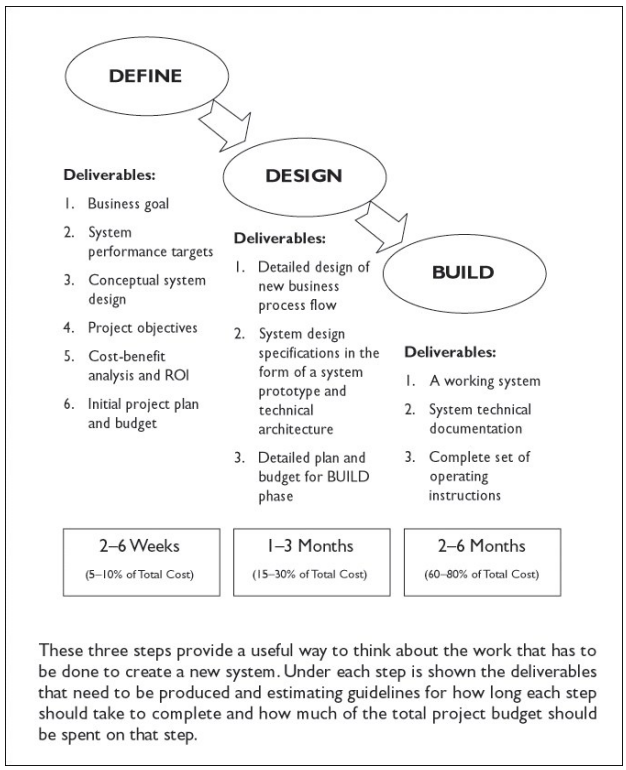


**Figure 8-7. System development sequence.**

## Chapter Summary

Companies should always be looking for ways to improve how they do things, but making good ideas into goals, and then successfully executing plans to get there, requires a great deal of thought. This chapter introduces a step-by-step process to create opportunities for improvement, and it will work within a company or across a supply chain. The process includes five deliverables:

1. A clear statement of the business goal to be accomplished.
2. The performance criteria required from the system. These criteria fall into four measurement categories: internal efficiency, customer service, demand flexibility, and product development. These are the conditions of success that the system must meet.
3. A conceptual design for a system to accomplish the business goal and meet the performance criteria. The system design is composed of people, process, and technology. The conceptual design is the embodiment of the strategy being used to attain the goal.
4. A definition of the project objectives needed to build the system. The objectives are the things that must be built to create the system outlined in the conceptual design.
5. A cost-benefit analysis that verifies the project is worth carrying out.

In formulating supply chain improvement projects, it is a far better approach to successfully carry out a sequence of small steps than to attempt to make a great leap forward and risk falling short. In an approach that involves taking a sequence of smaller steps, the stakes at each step are modest and the work is more manageable so success is easier to achieve. In the approach of taking a great leap forward, the stakes are high—the work is enormous, success is harder to achieve, and the cost of failure is high.

## Discussion Questions

1. Using the list of possible retail opportunities at the beginning of this chapter, brainstorm one of your own. What is not being done, or could be done better, in a store with which you are familiar? How would your idea improve it?
2. From the information in this chapter, do computer software and Internet access always have to be part of a system? Why or why not?
3. Since the system development process focuses more on an individual company, how would you modify or adapt it for

use among several companies in a supply chain? How should the various responsibilities be divided up among several teams working together?

4. Why do the authors say the risk of failure is greater by not following this system? What about a team that has a “good hunch” and feels they must act on it quickly in order to take advantage of market conditions? Would it be okay *not* to follow the development process, or to skip a step?

5. Which of the four types of benefits of system development do you think is the most important to a retail business? Explain your choice.

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## The Incredible Journey Continues

**SEPTEMBER 29—TAKING ORDERS**

McGee’s order and those of the 4,054 store managers are transmitted to CVS’s E3 system for replenishment and the warehouse management system for fulfillment. (As mentioned earlier, E3 collects and analyzes data from Category Map, the warehouse management system and from the stores to gain a comprehensive view of what CVS needs to order and when.) The warehouse management system creates an optimized schedule for picking, packing, and shipping orders to the individual stores.

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## Why CVS managers check inventory levels instead of relying on POS data

Why do CVS store managers check inventory levels before ordering when the cash registers collect POS data that could be used for automatic replenishment? The plan is that someday they won’t have to. Certainly, many other companies already have automatic replenishment systems in place. But in 1998 CVS was in no hurry to implement a system that could diminish customer service and quality levels without first addressing the political and logistical issues that go along with it, says Senior Vice President for MIS and CIO Howard Edels.” A lot of companies say they have such a system... but when you’re talking about something where the computer takes over the responsibility of individuals, you want to make sure everyone buys into that program. CVS is known for its excellent customer service because the store managers are empowered. If they make a mistake [by forgetting to place an order, for example], it’s their mistake; they treat you nicely and say, ‘I’m sorry, I’ll take care of it.’ But if they see the computer as having control, the answer becomes, ‘I don’t know why your order isn’t here, the stupid computer didn’t bring it.’ It changes the whole relationship with customers. So we want to make sure that the store folks really understand that it’s helping them. That’s why we’ve been slower than some companies.”

This careful, conscientious management style is a hallmark of the “CIO-100” winners, says Andersen Consulting’s Gregory J. Owens.

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