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BEST PRACTICES IN SUPPLIER MANAGEMENT AND DEVELOPMENT

The first section of this book stressed the importance of the supplier evaluation and selection process. And, it is safe to say that few knowledgeable observers would argue against the importance of this process. Few observers would also argue against the importance of what comes after. The selection of a supplier, which represents the end of one process, is also the start of something very special. That something special is the commencement of the buyer-seller relationship, a relationship that could continue for many years, possibly even decades. Never forget that a natural order of events takes place here. Supplier evaluation and selection comes first, followed by supplier management and development.

This chapter begins the section of the book that shifts our thinking from supplier evaluation and selection to supplier management and development. Specifically, the chapter provides an overview of supplier relationship management before moving to the main focus of the chapter—supplier performance development.

MANAGING SUPPLIER RELATIONSHIPS

One of the most important responsibilities of supply managers is the cultivation and nurturing of supply chain relationships. And while any discussion of relationships sounds likes we should be sharing our feelings with Dr. Phil, this seemingly intangible area can lead to very tangible benefits. Supplier relationship

management can result in favorable treatment from suppliers, access to supplier-developed innovation, and a heightened willingness of suppliers to make investments that only benefit certain customers.

Supplier relationship management (SRM) is a broad-based management methodology describing how a firm interacts with its supply base. It is a philosophy about supplier relationships that is shared throughout an organization by purchasing and supply management professionals. How a buying company manages its suppliers can be a source of competitive advantage.

When managing suppliers, it is important to appreciate that not all supplier relationships are equally important. Knowing when, where, and how to pursue a specific kind of relationship with a supplier is an important part of the procurement process. Figure 5.1 presents a continuum of supplier relationships.

Counter-productive relationships, also called antagonistic relationships, feature the parties working against each other's interests. In addition, neither party feels a need to assume responsibility for what transpires. This scenario clearly is detrimental to the longer-term success of a relationship. While this type of relationship is not recommended, they do occur. A buyer who sues a supplier to prevent a price increase that the buyer contends violates a contractual agreement is a clue that a relationship is moving toward counter-productive.

Competitive relationships—also known as distributive, win-lose, or adversarial relationships—feature supply chain members competing over a fixed amount of value (which is the definition of a win-lose relationship). This contrasts with working jointly to create new opportunities that lead to new value for the parties (which defines win-win). For many items the relationship with suppliers should be competitive. Beyond the arms-length activities taking place, few benefits will

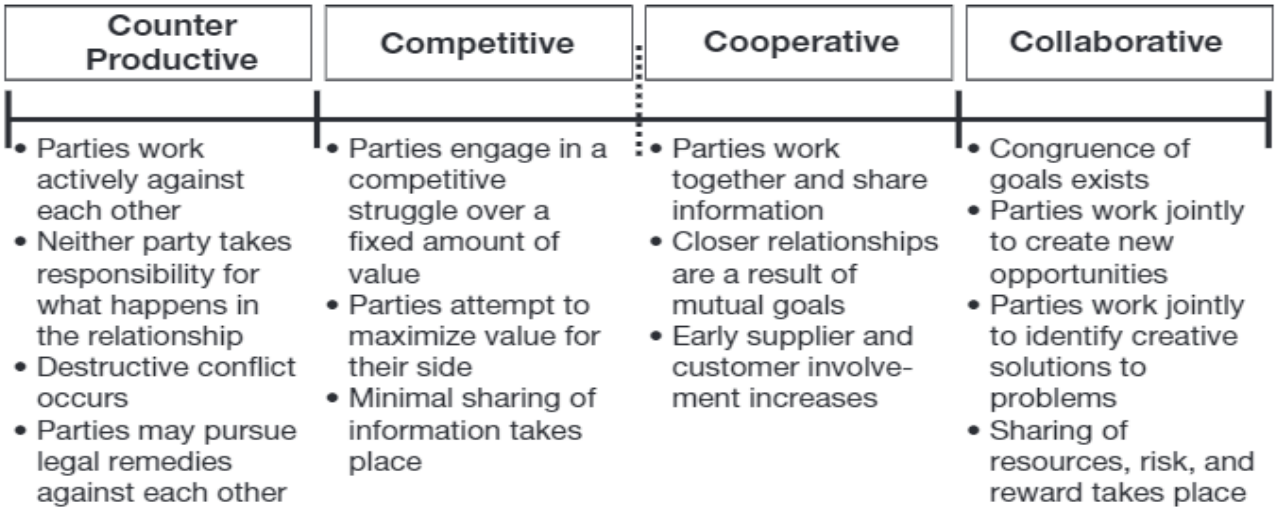

Figure 5.1 Continuum of supplier relationships

result from a closer relationship. While a majority of a buying firm's relationships should be competitive, these relationships usually do not comprise a majority of total purchase dollars.

Cooperative relationships, also referred to as integrative relationships, recognize the value of working jointly on a common business-related assignment or purpose. These relationships feature open sharing of information. They are most often associated with suppliers who are expected to be longer-term members of a supply base.

Cooperative relationships with suppliers are often formalized through longer term contracts that lead to discussions about how to improve cost, quality, delivery, packaging, inventory management, product innovation, and service, all factors that can affect performance. These relationships may feature, for example, early supplier involvement during product development.

Collaborative relationships, sometimes called creative relationships, involve a limited number of suppliers that provide items or services that are essential or unique to a firm's success. A willingness to work jointly to identify better ways to compete in a global marketplace is characteristic of a collaborative relationship.

These relationships, which should be relatively few, represent the most intensive relationship possible between a buyer and seller. They feature executive-to-executive interaction, joint strategy development sessions, and a sharing of resources and risk. Supply chain alliances and partnerships, for example, are collaborative by design. The parties ideally recognize that the value they receive would be far less than if collaboration did not exist.

Cooperative and collaborative relationships should, by definition, be win-win. This means the parties, by working together, can increase the amount of value derived from a relationship. Value is not considered a fixed commodity.

The Role of Trust

Numerous studies have concluded that trust is a major predictor of relationship success. In fact, it is safe to say that the most important factor that affects the success of a buyer-seller relationship is trust. Trust refers to the belief in the character, ability, strength, or truth of the parties in a relationship. While different models of trust exist, a simplified model views trust in terms of two primary dimensions: character-based trust and competency-based trust.

Character-based trust refers to ethics, honesty, and truth of a participant. Relationships that feature a lack of trust are characterized by lengthier contracts, expensive and time-consuming oversight (often by a legal group), and a reluctance to share information. Conversely, the characteristics of trust-based relationships are the opposite of relationships that lack trust. Trust-based relationships are more efficient.

Trust is not automatic in a buyer-seller relationship. It evolves over time and is demonstrated by actions rather than words. To that end, it makes sense for both buyers and sellers to engage in trust-building actions and activities. Examples of trust-building actions and activities include:

- Open and frequent communication across organizations, particularly face-to-face
- Co-locating personnel, which promotes frequent and open communication (frequency of communication is a predictor of trust)
- Following through on promises and commitments
- Acting legally and ethically in all dealings
- Acting on the behalf of the relationship rather than self-interests
- Publicizing success stories and personal narratives, especially those that enhance the standing of the other party
- Treating information and data gathered within the relationship as confidential

Importance of Supplier Relationship Managers

A supplier satisfaction study involving 300 suppliers revealed that over 90 percent of suppliers agree strongly that it is critical for the customer's personnel, whom they deal with on a regular basis, to be knowledgeable about their product, processes, business, and industry.[1] Almost all suppliers also indicated they have assigned an individual at their organization to be the primary contact with their customer. And, almost every supplier indicated they are aware of a specific individual assigned by the customer to manage the buyer-seller relationship. Suppliers overwhelmingly agree that it is important to interact regularly with their customers through specific and knowledgeable individuals. They also agree about the importance of face-to-face interactions with these individuals.

When tasking specific individuals with the responsibility of working with a supplier, it is not sufficient to simply assign an individual with that responsibility. In the eyes of suppliers, that individual must also be highly qualified. Without question, relationship management demands effective relationship managers.

DEVELOPING SUPPLIER PERFORMANCE CAPABILITIES

A key component of supplier management is supplier development. Supplier development represents any activity or effort on the part of a buying firm to improve the performance of its suppliers. At times, although rare, we may also

witness a supplier working to improve the performance of its customers. A supplier engages in customer development because it understands the concept of *co-destiny*. That concept maintains that what happens to one party affects the other, and vice versa. So, if a customer becomes healthier and grows its business, the supplier grows along with it.

The logic behind supplier development is actually quite clear. Most companies have reduced the size of their supply base dramatically, at least at the tier-one level, compared with historical levels. While at one time the practice was to work with many suppliers, the prevailing view today is to work with a smaller supply base in terms of numbers. It is easier to manage and engage in value-creating activities with 100 primary suppliers rather than 2,000 suppliers. Many remaining suppliers are now on longer term rather than short-term contracts—making supplier switching that much harder.

With fewer remaining suppliers, many of which have longer term contracts, supply chain improvement will occur primarily through working with existing suppliers rather than large-scale supplier switching. Engaging in supplier development with existing suppliers is a logical way to pursue continuous improvement. And, as followers of quality management understand well, the need for continuous improvement never goes away.

From an historical perspective, supplier development has been philosophically difficult for many companies, at least in the United States. Traditional or adversarial relationships, which characterized the typical buyer-seller relationship, are not conducive to the kinds of information sharing and cooperation that supplier development requires. And, a lack of trust between buyers and sellers almost ensures that supplier development efforts, if they exist at all, will fall short of performance expectations. Historically, if a supplier experienced problems, the response by a buyer was to warn the supplier that if it did not improve, another supplier was available to take that supplier's business. Today, as suppliers contribute greater amounts of value, such as providing entire systems instead of simply components, the ability to *kick out* these suppliers becomes increasingly difficult.

The philosophical reluctance to pursue supplier development means that most supplier development activities have been reactive. And what are we reacting to? Usually the reaction is to problems that require immediate attention. A preferable approach is to focus on activities that help prevent problems from occurring in the first place. Unfortunately, since most companies view supplier development as an expense, a natural reluctance to take on additional expenses limits our willingness to engage in development activities.

Supplier development has most often been applied to underperforming suppliers, although that does not mean we cannot work with higher performing suppliers. When working with higher performing suppliers, the primary objective

is often to develop new supplier capabilities. Supplier development efforts fall primarily into three broad categories:

- Working with a supplier to improve an existing performance capability
- Working with a supplier to resolve a problem with an existing capability
- Working with a supplier to create a performance capability where none previously existed

No single activity defines supplier development. In fact, any initiative designed to improve supplier performance could theoretically fall under the development umbrella. Examples of development activities include providing education or training programs; enhancing working relationships with suppliers to promote joint improvement efforts and information sharing; and providing direct financial support. Other types of development include assigning personnel to work on-site at a supplier, providing process equipment, and providing technology. There is no shortage of ways to practice supplier development.

Supplier development also presents risk. What if a buying company makes a financial commitment to a supplier and the development effort fails to produce anything of substance? Nowhere is it written that supplier development has to succeed. Why is a buying company improving the performance of a supplier when other customers of that supplier, perhaps even competitors, will likely benefit from the supplier's improved performance? This line of thinking elevates the risk that supplier development will not be undertaken. And, what if supplier development, particularly when the focus is on developing new capabilities, creates a new and more powerful supplier that eventually becomes a competitor? What if a supplier's enhanced capabilities makes it attractive for a takeover by another company that is not friendly to your company? If you think hard enough about all the potential risks present in supply chains, you might not want to get out of bed in the morning.

Factors Critical to the Supplier Development Process

Supplier development is one of those areas where, if it were easy, every company would routinely engage in it—and we know that is not the case. With any important process we must understand the factors that will help define success. After all, these are called critical success factors for good reason.

Executive Commitment

It should come as no surprise to say that any major initiative will fail if it does not have executive commitment. For supplier development this means commitment at the buyer and the supplier. Executives at the buyer show their commitment by making resources available to support development efforts. Executives at suppliers demonstrate their commitment by buying-in to the goals of supplier

development, which they make known in no uncertain terms across their organization. This contrasts with situations where executives at a supplier perceive they have to go along with a buyer's development requests or risk losing their business.

Trust-based Relationships

A number of years ago, a major automotive company began to pursue its own version of supplier development. This involved sending a team to visit suppliers for a week to make plant layout changes. At the end of the week the buyer then demanded double-digit price reductions from these suppliers. Needless to say, suppliers began to fear these visits. A complete lack of trust characterizing the buyer-seller relationship was a major inhibitor to the success of the development effort. As important as any factor, supplier development success requires trust-based relationships. Without trust the probability that open sharing of information will take place diminishes greatly.

Credibility

Any buying company that initiates supplier development effort must have *street cred*. What this means is that the supplier must perceive the buyer actually has expertise in a particular subject area. Years ago a major United States company began to promote its supplier development program. Unfortunately, this company was itself not a strong performer, either in operational or financial terms. This company was no role model. It should come as no surprise that suppliers did not assign much credibility to this company's development process and resisted any development overtures. Privately, some suppliers suggested that the buying company might be better off asking its suppliers for help.

Data and Measurement Capabilities

Financial and other resource constraints ensure that most companies can engage in a limited number of supplier development projects. This means companies have to be cautious regarding where they allocate their resources. What suppliers offer the best payback? What suppliers are not worth the effort and should instead be candidates for elimination? What performance measures are in place to verify the success of any efforts? Some companies will use their supplier scorecards to help identify development opportunities. While in theory this sounds good, the reality is that far too many companies have poorly designed scorecards that are of limited use. Supplier development requires some serious data support from reliable sources.

Commitment of Financial and Human Resources

When all is said and done, supplier development is largely a people business. This process usually relies on engineers, quality experts, logistics personnel, and

others to be part of any development effort—often working directly at a supplier's location. Unfortunately, few organizations have people committed specifically to supplier development activities. This means that supplier development competes with other endeavors for human and financial support, including an employee's regular job responsibilities. Without adequate human support, development initiatives will be severely limited or even unsuccessful. On the financial side, supplier development usually requires travel and oftentimes, equipment and supplier financial support. None of this is free.

Time

Many supplier development initiatives require significant time before showing results. If correcting a problem or developing a new capability were quick and easy, then the need for supplier development would not be all that great. In the lean space, even five-day Kaizen workshops require much more than five days when planning activities are taken into account. The challenge is that most managers, particularly in the U.S., are not particularly patient. The quest for quick results often conflicts with our development objectives, which may take months before reaching fruition, if at all. The challenge is to be patient, but not too patient.

A Proper Power Relationship

Power represents the ability to exert influence over another party. Supplier development usually, but not always, features a larger buyer working with a smaller supplier. This size differential enables, at least partly, a buyer to approach a supplier in the first place. While a smaller customer *could* approach a larger supplier, it is not common. The author once worked with a smaller company whose main suppliers were Dow Chemical and DuPont. The power relationship with these suppliers was not conducive to any serious supplier development discussions. On a positive note, having a blue-chip roster of suppliers should limit the need for supplier development—at least for those development efforts that attempt to solve problems. On the flip side, larger suppliers usually have significant leverage over their smaller customers.

This set of success factors, while certainly not the only ones we could list, will influence greatly the success or failure of supplier development.

SUPPLIER DEVELOPMENT BEST PRACTICES

As with supplier selection, it is important to appreciate that a set of best practices exists that defines leading-edge supplier development. Companies that excel at supplier development look and act differently than companies that fall short of

the mark. Use these best practices to perform a self-assessment of supplier development at your company. Let's examine the practices that define effective supplier development.

An Executive Steering Committee Helps Identify and Prioritize Development Opportunities

It is hard to imagine a leading supply organization without an executive steering committee or advisory board to provide strategic leadership. These boards or councils, usually comprised of internal executives from various functional and operating groups, engage in some serious work. The following includes the responsibilities of an executive steering committee at a leading company:

- Establish the strategic direction for purchase commodities
- Charter and staff strategy development teams
- Search *outside the box* for new sourcing ideas and methods
- Coordinate strategy development with other functional groups
- Pursue consistent supply policies, procedures, and processes worldwide
- Establish company-wide improvement targets
- Ensure compliance to corporate agreements
- Monitor supply chain risk and support company-wide risk management initiatives
- Identify and support supplier development initiatives

Just as leading supply organizations have a high-level supply executive, these organizations are also supported by a high-level steering committee or council that sets the strategic direction for some very important areas. Supplier development just happens to be one of those areas.

A Well-understood Supplier Development Process Is in Place

Like most topics that fall under the supply management umbrella, supplier development also benefits from taking a process view. And like all processes, supplier development can be displayed generically as a series of steps:

Step 1: Identify improvement opportunities

Step 2: Target specific suppliers that should benefit from development activities

Step 3: Meet with the supplier's leadership to obtain buy-in, agree on the development opportunity, and develop project plans and clear measures of success

Step 4: Identify the type of supplier development support
Step 5: Make development resources available, including human and financial resources
Step 6: Perform the development project
Step 7: Measure and report the financial return from supplier development

A central part of this process includes having a methodical way to identify supplier development candidates. A typical supply base contains three groups of suppliers.

Budget Is Available to Support the Expenses of Supplier Development Participants

As mentioned, few companies allocate human resources specifically to support supplier development initiatives. This means development activities must rely on functional groups for support. Besides providing human support, functional managers at some companies have also been asked to cover their employee travel and living expenses while their personnel are working on development projects. Any nonprocurement manager who enjoys having these expenses come out of his or her budget is not normal.

Requiring functional managers to support supplier development expenses will only serve as a barrier to supplier development. A partial way to lessen resistance from managers is to create a budget specifically to cover employee travel and living expenses. Best-practice companies anticipate this issue and respond to it by not making the managers, who provide the personnel to support development initiatives, also absorb variable travel and living expenses.

Use Financial Investment Techniques to Evaluate Development Initiatives

It is safe to conclude that most corporate executives, if they think about supplier development at all, view it primarily as an expense. When this is the case, it should come as no surprise that supplier development is not always looked upon favorably. A basic tenet of financial thinking is *expenses are bad, investments are good*. Expenses are a necessary evil, and as such, this evil should be minimized whenever possible.

The easiest way to forgo the expenses associated with supplier development is simply not to perform any development efforts. This is due partly, if not largely, to not applying financial assessment techniques such as payback, net present value (NPV), or internal rate of return (IRR). The next chapter addresses this topic

specifically. By the time the reader is done with this section of the book, he or she will be able to frame development projects in ways that excite executive managers.

Manage Supplier Development Initiatives as Projects

Applying project management techniques to supplier development initiatives piggybacks on the inherent value of managing work as projects. Structuring work as projects rather than as continuous work or a set of activities is attractive for several reasons. First, projects have a defined start, and an end date that builds in preestablished goals and milestones. Second, projects contain a defined scope of work that is specified prior to starting the project. Third, project control tools (such as Microsoft Project) are available that help the participants manage time, gauge the progress of a project against preestablished milestones, assign responsibilities, and control a project's budget. Finally, we can visually display a project and its tasks, including the interrelationships among those tasks. Visualization helps participants understand the big picture.

Use a Supplier Performance Measurement System to Identify Development Opportunities and to Track Improvement

Many companies use their supplier performance measurement systems (i.e., scorecards) to identify and rank development opportunities, particularly opportunities that involve performance shortfalls. The reality is that too many companies have poorly designed scorecards. This can be problematic because (1) poor scorecards will constrain a company's ability to identify valid development opportunities, and (2) the ability to measure the effects of any improvement efforts are likely impacted due to poor measurement capabilities.

What are the shortcomings of many supplier scorecard systems? Perhaps the most obvious shortcoming is many scorecards measure suppliers the same way. If suppliers are not all equal, then why apply equivalent measures? Many systems also rely extensively on data collected manually for their input (raising concerns about accuracy), usually monthly or quarterly (raising concerns about timeliness). Few supplier measurement systems feature objective, real-time data. It is not hard to conclude that a lack of data accuracy and timeliness is a severe limiter. Too many systems are also populated with subjective rather than objective assessments of supplier performance. The list of potential shortfalls with supplier scorecards could go on and on.

Best practice companies appreciate the importance of an effective performance measurement system and strive to continuously improve their measurement capabilities. They address the shortcomings that limit the value of supplier

performance measurement because they know that measurement and data are key development enablers.

Work with Suppliers to Identify Opportunities and to Gain Support

Let's agree that supplier development efforts are likely to fail if they lack a supplier's complete support. For those who believe that suppliers are always receptive to a company's performance improvement overtures, get over that delusion right now. While a large company may have the power to coerce a supplier into submission, the use of coercion is, at best, a short-term tactic. Leading companies understand that supplier development is a joint activity that features executive-to-executive engagement early on to secure higher-level buy-in. While some development activities may feature lower-level *fixes*, other initiatives will require a greater commitment of time, personnel, and money.

Share Development Savings with Suppliers

This best practice borrows heavily from supplier suggestion programs. Let's illustrate this practice with an example. In the 1990s, Chrysler initiated its supplier development program called SCORE (supplier cost reduction). At its pinnacle, Chrysler received thousands of supplier suggestions a year that resulted in hundreds of millions of dollar in savings annually. The SCORE model was widely cited as the premier supplier suggestion program in United States industry.

What made SCORE so successful? One prominent factor was Chrysler's willingness to share savings with suppliers. The lesson learned was that sharing of savings within a trust-based relationship provides a powerful incentive for suppliers to participate. Suppliers openly brought their best suggestions to Chrysler, often to the chagrin of Ford and GM. As an aside, after Daimler purchased Chrysler, the supplier suggestion program faded away. The Germans apparently did not respond well to the idea of sharing savings.

Some will philosophically argue against the sharing of savings with suppliers, particularly if a supplier development initiative is attempting to solve a problem. While this argument has merit, it ignores the fact that leading companies expect to apply their development efforts less to problems and more to continuous improvement opportunities and the development of new performance capabilities. A willingness to share savings should be a clear indication that a buyer wants to engage in a win-win relationship. It is hard to argue that the sharing of savings is a disincentive for suppliers to participate. Leading companies understand that motivating suppliers to participate, which worked beautifully with Chrysler's supplier suggestion program, should also work with supplier development projects.

Establish a Central System for Controlling and Reporting Supplier Development Projects

Leading companies have a central system where projects and other initiatives are uploaded, something that provides visibility across an organization. Tapping into these corporate systems provides legitimacy to supplier development efforts. A central system helps embed a supplier development process into a company's culture, partly through the legitimacy afforded by the system. Across the company everyone can see that development efforts are managed similarly to other important projects and initiatives.

The use of a central system leads to other benefits. A key feature of a central system is its regular updating, thereby promoting accountability and discipline. Creating a central system or repository, whatever its final design, is also a way to avoid confusion about the extent of a company's supplier development efforts. Instead of diffused reporting across divisions, sites, and geographic locations, a company can easily see the extent of its company-wide development efforts. And, it can easily transfer the results from development projects to a company Intranet for widespread sharing. A central system also helps with the compilation of performance reports. Finally, personnel across a company can see if any development efforts are similar to what they are proposing. The central system serves as a repository of supplier development initiatives where learning from previous projects is shared with personnel participating in future projects. Why continuously reinvent the wheel?

Recognize That No Single Development Technique Applies to all Suppliers

As mentioned, supplier development represents a broad array of activities that are designed to improve supplier performance capabilities. Taking a broader view of this topic provides a degree of flexibility that supports creativity. The following examples illustrate this point:

- **McDonalds:** A prime example of supplier development is McDonald's support of Trikaya Agriculture, a supplier of fresh iceberg lettuce. Initially, lettuce could be grown only during the winter months in India. With McDonald's expertise, Trikaya Farms in Talegaon, Maharashtra now grows lettuce year round. McDonald's has provided assistance in the selection of high-quality seeds, exposed the farms to advanced drip–irrigation technology, and helped develop a refrigerated transportation system. Trikaya Agriculture has become a major supplier of iceberg lettuce to McDonald's for its Indian operations.[2]

- **IBM:** IBM has implemented a Commercial Mentoring Program with 6-8 diverse suppliers participating at any given time.[3] Each supplier has an IBM employee assigned as its mentor for 12-18 months. All the participants are incumbent suppliers with long-term relationships that can still benefit from a closer relationship. IBM mentors identify development efforts that will result in advancing the supplier's business intelligence. Each mentoring session begins with a two-day retreat where the top members of the suppliers' management team meet with their mentor and the IBM supplier diversity program manager who is responsible for the program. IBM utilizes several educational programs designed to improve the business skills of diverse suppliers. These programs cover subjects such as quality, financial and management skills, strategic planning, and technology. These businesses also participate in various procurement strategy and cost management courses at IBM.
- **Cocoa:** If there is one item that is the lifeblood of chocolate producers, it is cocoa. And, if there is one item that presents a strategic risk to chocolate producers, it is cocoa. Around 70% of the world's cocoa crop is concentrated in five African countries, a region that is not the most stable of locations. Even on a good day cocoa can be risky to grow; farms experience lower yields compared with other crops, limited access to fertilizer, and an abundance of pests. Not surprisingly, cocoa growers are increasingly shifting to more profitable crops such as rubber while younger farmers are reluctant to become cocoa farmers in the first place. Major chocolate companies have come to the conclusion that they must work with suppliers to manage the risks that may affect their cocoa supply. They are working to develop pest resistance cocoa beans, ensure farmers have access to needed fertilizer, and financially support young farmers to encourage them to grow cocoa.

As these examples show, supplier development comes in different shapes and sizes.

CONCLUDING THOUGHTS

Supplier development represents a viable way to solve supply chain problems or to pursue continuous improvement opportunities. Larger buyers often use their development efforts to help disadvantaged suppliers, such as minority and women-owned suppliers as well as international suppliers that need to be brought up to speed. Given that supplier management is an active rather than passive process, understanding what defines effective supplier development becomes a necessity. The next chapter will present financial techniques for framing supplier

development and other supply chain initiatives as investments rather than as expenses. Life takes a different turn when we focus on investments rather than expenses. It is time to change our thought process.

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6

SUPPLIER MANAGEMENT AND DEVELOPMENT—THE FINANCIAL PERSPECTIVE

Most would argue that the financial crisis of 2008 was a severe shock to the world economy. At one point, there was concern at the highest levels of government that the U.S. economic system might actually collapse. At the corporate level, the need to reduce expenses quickly took on a tremendous urgency. And, that's exactly what happened as companies cut expenses as rapidly as they could.

Supply managers saw their travel budgets cut, making visits to suppliers suddenly a luxury—and, training was no longer part of the picture. The CEO of a major Midwest equipment manufacturer reduced his company's highly respected supplier development program to almost nothing. He viewed supplier development as an expense, and expenses had to go away. A supply professional later commented that he knew the supplier development program was more than paying for itself, but *we couldn't make the financial case*.

What if you could turn those nasty expenses around and frame them in a way that excites the decision makers at your company? That single question sums up this chapter. This chapter explains three financial investment techniques (also known as capital project evaluation techniques) that will enable you to frame expenses as investments. We will apply these techniques in ways that are not at all typical. By the end of this chapter you will understand the simple payback method, the net present value (NPV) method, and the internal rate of return (IRR) method of financial evaluation.

CAPITAL PROJECT EVALUATION TECHNIQUES

Certain techniques are used whenever a company evaluates capital project expenditures, such as building a new facility, buying a piece of equipment, or installing a new information technology (IT) system. These techniques are also used when evaluating new products. They are presented in the same section of the book with supplier development to illustrate that we can apply these techniques across a variety of settings. Their basic application remains the same regardless of where we use them.

It is not realistic to assume that every initiative in supply chain management (SCM) involves a capital project. In fact, most supply chain initiatives will not be part of a capital project. When the initiative is not part of a capital expenditure it is treated as an expense. And never forget, the prevailing view among most managers is that investments are good and expenses are bad. What we want to do is manage supply chain initiatives, such as supplier development, as investments, and apply financial techniques where they historically have not been applied. The techniques we review in this chapter are robust, which means they work across a wide range of settings. Investments tend to gain the favor of key decision makers much more than expenses.

The following sections describe three financial evaluation techniques—simple payback, NPV, and internal IRR. Chapter 7 will provide the opportunity to work with these techniques directly.

Simple Payback

The first evaluation technique presented here is also the most basic. Simple payback represents the length of time required to recover the cost of an investment without considering the time value of money. If the cash flow or benefits from a project are uniform each year, then the payback formula is simply:

$$\text{Payback Period} = \text{Cost of Project}/\text{Annual Cash Flows}$$

Payback may be best suited for projects that are not overly complex or where management wants to get a relatively quick snapshot of an expected payback period. This method does not consider the time value of money, so the calculations are relatively straightforward. The payback method is popular because it is relatively simple and, for a company in a tight cash position, it provides a quick indication of how soon it will recover invested funds.[1] For our purposes, simple payback may not be enough to catch management's attention (i.e., create the *wow* factor) unless a company has a minimum payback threshold in terms of time that the calculated payback easily meets.

Let's provide an example of a simple financial payback. Assume a company decides to put forth a cash outlay of $100,000 to purchase smart sensors for

installation at a supplier's work cell. These smart sensors monitor the physical process and quality of products as they are produced. Project planners have identified the relevant savings due to better machine uptime and improved quality to be $75,000 annually over a three-year expected life. A simple payback analysis reveals the payback is one year and four months, or 1.33 years.

How did we arrive at the payback of one and a third years? During year one $75,000 of the $100,000 in investment was realized as savings. That left $25,000 of the original investment still outstanding. Given that the second year savings are also expected to be $75,000, the remaining $25,000 of the investment will be realized after four months ($25,000 is one-third of $75,000, and four months is one-third of a year). This technique assumes that savings are realized in a level manner across the year. Alternatively, since the annual cash flows are expected to be uniform each year, we can use the formula presented at the beginning of this section to calculate the payback period:

$$\text{Payback Period} = \$100{,}000/\$75{,}000 = 1.33 \text{ years}$$

The following example illustrates the payback method when cash flows from the investment are not uniform each year.

Simple Payback Illustrated

Table 6.1 illustrates the use of the simple payback method for two projects. From this example we see that Alternative *C* has the fastest payback—at two years. It is important to note that the size of the payback in terms of monetary outcomes is not a factor in this analysis. This analysis is all about how quickly a company recoups its investment. If that is troubling then perhaps a different evaluation technique that explicitly considers financial returns rather than time might be in order.

Interestingly, Alternatives *A* and *C* generate the same amount of funds above their investment (each alternative returns $150 above their investment amount). However, Alternative *A* has a lower investment amount compared with Alternative *C* ($300 investment compared with a $400 investment). A technique such as NPV or IRR would show that Alternative *A* has a slightly higher rate of return. All we know from the simple payback analysis is that Alternative *C* is faster at recouping the investment. In this case, is faster better? Or is a higher return better? If we are interested in the return, then we should apply other evaluation techniques.

Net Present Value

A company may require a more complex financial assessment of a proposed project. And, we may need a technique that better grabs the attention of management.

Table 6.1 Simple payback period illustrated

	Alternative A	Alternative B	Alternative C
Cash Outflow Year 0	($300)	($350)	($400)
Cash Inflow Year 1	$100	$100	$200
Cash Inflow Year 2	$125	$100	$200
Cash Inflow Year 3	$225	$200	$150
Pay Back Period:	2.33 years	2.75 years	2.0 years

Figures are in thousands of dollars.

Calculations:

Alternative A: In Year 1, a $100 cash inflow leaves $200 of the $300 Year 0 investment remaining; in Year 2 a $125 cash inflow leaves $75 of the $200 investment amount remaining; in Year 3 a $225 cash inflow will cover the remaining $75 investment amount in four months, ($75/$225 = .33 of a year)

Alternative B: In Year 1, a $100 cash inflow leaves $250 of the $350 Year 0 investment remaining; in Year 2 a $100 cash inflow leaves $150 of the $250 investment amount remaining; in Year 3 a $200 cash inflow will cover the remaining $150 investment amount in nine months, ($150/$200 = .75 of a year)

Alternative C: In Year 1, a $200 cash inflow leaves $200 of the $400 Year 0 investment remaining; in Year 2 a $200 cash inflow leaves $0 of the $200 investment amount remaining

NPV is a well-established evaluation technique in the finance world. It represents the present value of projected future cash flows or benefits discounted at an appropriate cost of capital or hurdle rate less the cost of the investment. The hurdle rate is discussed shortly.

Whenever we see the word *net*, it is safe to conclude that something has been backed out or subtracted to arrive at a final result. NPV, which is a more complex financial evaluation compared with the simple payback method, follows a multistep process:[2]

1. ***Estimate the initial cash outlay:*** This includes the primary capital expenditures, as well as any other costs to pursue the project. For example, freight costs to receive new capital equipment, when paid by the company that is receiving the containers, should logically be included as part of the investment cash outlay. Unless told otherwise, initial cash outlays occur at *Time 0*.
2. ***Determine annual incremental operating cash flows:*** This requires quantifying the net savings that result from the project. There are a variety of ways to arrive at the incremental cash flows. One way is to perform a cost-benefit analysis to arrive at annual benefits due to the project. Another way is to prepare an estimated income statement and cash flow with and without the project (what is called *pro forma* statements). The

difference represents the incremental impact due to the project. Both methods require a careful assessment of individual benefits or incremental cash flows.

3. ***Project the terminal cash flow or expected salvage value:*** Add the salvage value of any assets at the final project year's operating cash flow.
4. ***Determine the present value of the future cash flows:*** This represents the value in today's dollars of the benefit stream over each year of the project. Future flows are discounted by some percentage provided by finance, such as a hurdle or discount rate.
5. ***Determine the net present value of the project:*** The project's NPV is the sum of the present values of the flows (benefits received each year), less the outflows (investment cost). A positive number means the current value of the discounted future benefits exceeds the project hurdle rate.

The challenge when using any financial investment technique is arriving at accurate investment costs and incremental savings due to the project. This is not as simple as it sounds. Often, particularly for major capital investments, we are trying to forecast five years or more into the future, which raises the question of data validity. Capital project evaluation techniques are really forecasting techniques. Instead of forecasting future sales we are forecasting future cash flows and benefits. And, we are often forecasting multiple years into the future. It is a well-accepted tenet of SCM that the further we look into the future, the less reliable information becomes.

Most of us have sat through presentations where financial costs and savings are taken as absolutes without question. Oftentimes no one challenges the savings since they appear in a highly regarded financial format. These investment models always arrive at an output number. The question then becomes; are the costs modeled correctly?

Another issue involves the specification of the model. At times, we simply fail to consider an expansive set of benefits, both direct and indirect, that will result from a project. A prime example involves PPL, an electric utility that operates in Eastern Pennsylvania. PPL was the first regulated utility in the U.S. to install automated meter readers at 100 percent of the commercial and residential locations it served. While this was a game-changing project for the company and industry, the reality is—this project almost did not happen. It did not show a positive return when first conceived since the only major savings it considered was the elimination of human meter readers.

PPL failed to include the less obvious benefits from the new system. These benefits fall primarily into four categories, including: enhanced profitability from lower field service costs (such as fewer service calls due to meter problems), operational benefits from improved billing processes and results costs (100 percent of

meters are read each month with near-perfect accuracy), better outage management (the system can quickly pinpoint where outages occur), and benefits from using the system as a strategic data management platform. While project costs are usually modeled accurately, the benefits are sometimes understated or hard to quantify. This makes a project appear less viable.

The Hurdle or Discount Rate

An important financial topic is something called the hurdle rate. This rate plays a front and center role in many financial applications, including NPV analysis. In capital project evaluation, the hurdle rate, which is presented as a percentage, is the minimum rate that a company must earn before approving a project.[3] If a proposed investment or project is considered to have an unusually risky outcome, the hurdle rate could be adjusted to reflect higher risk.

Most companies establish their hurdle rate as equivalent to the cost to obtain capital, or the cost of raising cash through equity and debt. Companies with no equity only use the cost of debt, while companies with equity and debt arrive at a weighted average of the two.[4] Calculating the hurdle rate is the responsibility of finance.

Technically, the rate at which we subject investments in an NPV analysis is called the discount rate—it does not necessarily have to be the company's hurdle rate. Companies have different ways of identifying the discount rate, including using the expected return of other investment choices with a similar level of risk.

As mentioned, capital projects are often evaluated by discounting future cash flows to the present (which we call Year 0) by a hurdle or discount rate to determine the NPV of the project, or by computing the IRR and comparing that to the hurdle rate. (The next section discusses IRR.) If the NPV in terms of dollars (or whatever currency is used) of a proposed project is greater than zero, then the expected project return exceeds the hurdle or discount rate. Higher NPVs are better than lower NPVs. A negative net present value means the project is not expected to generate a return that meets or exceeds the hurdle rate. If the IRR method is used, a project where the IRR exceeds the hurdle rate is a candidate for approval. As with NPV, the higher the IRR percentage the better—from a financial return perspective.

NPV Illustrated

An important part of the NPV process is understanding the formula used to take future cash inflows and discount them at an appropriate rate into current values. While tables are available that provide values to discount future flows to the present, we will perform the calculations by hand to better understand the mechanics of the process. The following formula is used to arrive at the present value of a future value:

$$\text{Present Value } (PV) = \text{Future Value } (FV)/(1 + r)^n$$

Where r = the discount or hurdle rate and n = the future value period.

Let's say in three years we expect to have a cash inflow from a project of $400,000. If the discount rate is 12%, what is the present value of the $400,000?

$$\text{Answer: } PV = \$400{,}000/(1 + .12)^3$$

Note that $(1 + .12)^3$ is simply $(1 + .12)(1 + .12)(1 + .12) = 1.40$. The present value of $400,000 discounted at 12% is ($400,000/1.40) = $285,714. Viewed another way, the future value in three years of $285,714 at 12% is $400,000.

Let's expand our understanding by looking at two separate three-year investments to arrive at the NPV for each investment. Table 6.2 summarizes the data for two investments cleverly named Project *A* and Project *B*. As we can see, discounting the future value of cash inflows resulting from the project to the present (Time 0) is a fairly straightforward process. The NPV is essentially the *bottom line* of the investment. For Project *A*, the NPV is just over $125,000 when the future cash inflows are discounted at a 13% discount rate; the NPV for Project *B* is just

Table 6.2 Net present value illustrated

	Alternative A	Alternative B
Cash Outflow Year 0	($750)	($675)
Cash Inflow Year 1	$300	$310
Cash Inflow Year 2	$425	$300
Cash Inflow Year 3	$400	$350

Discount rate = 13%; figures are in thousands of dollars.

Project "A" NPV Calculation:

Present Value for Year 1 Inflow: PV = $300/(1 + .13)^1 =	$265.48
Present Value for Year 2 Inflow: PV = $425/(1 + .13)^2 =	$332.03
Present Value for Year 3 Inflow: PV = $400/(1 + .13)^3 =	$277.78
Present Value of Inflows:	$875.29
Less Year 0 Outlay:	$750
Project "A" Net Present Value:	**$125.29**

Project "B" NPV Calculation:

Present Value for Year 1 Inflow: PV = $310/(1 + .13)^1 =	$274.34
Present Value for Year 2 Inflow: PV = $300/(1 + .13)^2 =	$234.37
Present Value for Year 3 Inflow: PV = $350/(1 + .13)^3 =	$243.05
Present Value of Inflows:	$751.76
Less Year 0 Outlay:	$675
Project "B" Net Present Value:	**$76.76**

under $77,000 when the future flows are discounted at 13%. Remember, the 13% figure used here is provided by finance—supply chain managers did not calculate it. If we can only select one project, we would select the one with the higher NPV.

Internal Rate of Return

A similar concept to NPV is the IRR. IRR represents the discount rate that makes the NPV of all future cash flows from a particular project equal to zero.[5] While NPV and IRR are conceptually similar, they have a major difference. The first three of the five steps for arriving at the NPV that were presented earlier are identical for the IRR. With NPV, the rate at which we discount the future cash flows (Step 4) is provided by finance at the onset of the analysis. The NPV analysis cannot happen without knowing that rate. As illustrated, the end result of an NPV analysis is a monetary value. With IRR, the output of the analysis is a rate of percentage return for the project that makes *the present value of the discounted cash flows equal to the cost of the investment or project*. A company's hurdle or discount rate has no direct bearing during the calculations. An example will help clarify this admittedly confusing paragraph.

As a last step, we should compare the IRR against the corporate hurdle rate or against other projects under consideration. Obviously, we want to select projects that have the highest IRR and exceed the company's hurdle rate. It would be foolish to select a project that does not satisfy a minimum return rate.

IRR Illustrated

Table 6.3 illustrates the mechanics for arriving at an IRR. Our objective is to identify the IRR from this project, where the percentage return for the project makes the present value of the discounted cash flows equal to the cost of the investment or project. Please note that the values in this table are subject to some slight rounding.

We will use a trial and error method to identify the return rate where the discounted cash flows equal the initial cash outlay. Admittedly, arriving at the IRR this way is a bit cumbersome. Financial calculators are available that will allow the user to input the data to calculate the IRR with the push of a button. The use of a financial calculator is beyond the scope of this discussion.

In this example, we see that a 22% IRR is too high, while an 18% IRR is too low. The IRR for this project is projected to be around 20%, which is the rate where the return for the project makes the present value of the discounted cash flows equal to the initial cost of the investment or project. Is this a good rate of return? That will depend on a number of factors, including a comparison to a company's required hurdle or discount rate or comparisons to other possible projects. As with NPV, higher values are better.

Table 6.3 Internal rate of return illustrated

	Project
Cash Outflow Year 0	($900)
Cash Inflow Year 1	$300
Cash Inflow Year 2	$325
Cash Inflow Year 3	$425
Cash Inflow Year 4	$350

Project IRR Calculation at 22%:

Present Value for Year 1 Inflow: PV = $300/(1 + .22)^1 =	$245.90
Present Value for Year 2 Inflow: PV = $325/(1 + .22)^2 =	$218.12
Present Value for Year 3 Inflow: PV = $425/(1 + .22)^3 =	$234.05
Present Value for Year 4 Inflow: PV = $350/(1 + .22)^4 =	$158.06
Present value of cash inflows:	$856.13
Less Cash Outlay at Year 0	$900
Difference between inflows and outlay:	**($43.87) (22%, too high)**

Project IRR Calculation at 18%:

Present Value for Year 1 Inflow: PV = $300/(1 + .18)^1 =	$254.24
Present Value for Year 2 Inflow: PV = $325/(1 + .18)^2 =	$233.81
Present Value for Year 3 Inflow: PV = $425/(1 + .18)^3 =	$259.15
Present Value for Year 4 Inflow: PV = $350/(1 + .18)^4 =	$180.41
Present value of cash inflows:	$927.61
Less Cash Outlay at Time 0	$900
Difference between inflows and outlay:	**$27.61 (18%, too low)**

Project IRR Calculation at 20%:

Present Value for Year 1 Inflow: PV = $300/(1 + .20)^1 =	$250.00
Present Value for Year 2 Inflow: PV = $325/(1 + .20)^2 =	$225.69
Present Value for Year 3 Inflow: PV = $425/(1 + .20)^3 =	$245.95
Present Value for Year 4 Inflow: PV = $350/(1 + .20)^4 =	$168.79
Present value of cash inflows:	$890.43
Less Cash Outlay at Time 0:	$900
Difference between inflows and outlay:	**($9.57) (IRR = approx. 20%)**

FINANCIAL EVALUATION TECHNIQUE EXAMPLES

Let's remember something important here; there is no law that says financial evaluation techniques apply only to capital projects, and there is no law that says we cannot discount future costs the way we discount future cash inflows. Not all costs occur at Time 0, even in capital expenditure projects.

Let's look at two examples where we might apply financial investment techniques. The first example is a supplier development project. This is an area that would normally be thought of as an expense without much consideration given to the derived benefits, at least from a financial investment perspective. The second example is a more traditional capital expenditure project involving returnable containers. This chapter will not include the financial investment analysis of the cost and benefit data. That is part of the next chapter. Here, we simply describe the projects.

A Supplier Development Project

A number of years ago, an automotive company made a decision to reduce the total number of suppliers it actively maintained. Part of this company's strategy was to work with a smaller set of trusted suppliers and to help them develop new performance capabilities. One such opportunity involved the production of mirrors.

This original equipment manufacturer (OEM) used two suppliers to provide mirrors for a specific car model—one supplier for interior mirrors and one for exterior mirrors. Neither supplier could produce both kinds of mirrors, largely because the technology and tooling required to make each type is different. The OEM's plan was to work with the higher performing supplier (which currently made the exterior mirrors) to develop the capabilities required for also producing interior mirrors. The OEM's goal was to achieve lower costs, a lower parts-per-million defect level, and improved delivery performance.

Higher performance was not the only reason the OEM focused on that particular supplier. The two companies were located relatively close geographically, making visits less of a burden. This is not the case when a supplier's production facilities are located in another country, for example. As an aside, SeaMicro, a company that makes an innovative line of efficient and small data servers, relies on a contract manufacturer located less than a mile from its engineering and design center in California. SeaMicro's engineers are constantly at the supplier trying out new ideas and working on product and performance improvements. The company calls this approach *lean engineering*.

The two companies in our automotive example had a long history of working together. A vice president at the buying company commented that this supplier always supported the OEM's philosophy of continuous improvement and had been a willing participant in previous initiatives. The supplier, for example, is fully capable of delivering its products on a just-in-time basis due to a previous development project. From a cultural perspective the two companies have a good fit, characterized by mutual trust. The foundation for a successful supplier development initiative was in place before this initiative started.

Some companies might provide supplier development funds based simply on a faith that the effort will be successful. But do we know how successful it will be if we don't model it as an investment? Most decisions require more than faith.

Table 6.4 identifies a set of costs and incremental benefits associated with the mirror project. Identifying the costs and benefits for a financial analysis presents two challenges. The first challenge is to ensure that a full set of costs and benefits are identified. As mentioned, many projects fail to include all benefit categories, thereby under-specifying the financial model and making the investment look less attractive. Failure to include all the cost and benefit categories raises serious questions about the validity of the model. Unfortunately, these questions often arise when we are presenting our analysis to executive managers. Any shortcomings become evident at the wrong time.

The second challenge is populating the model with accurate data. On the cost side, direct costs are usually straightforward. In this example, we know that an engineer will be assigned to the supplier for an extended period. While technically that engineer's salary is paid whether he or she is working on this project or not, we must still allocate the salary to the project to ensure accurate cost accounting. The equipment and tooling required for the project should also be known with some certainty.

Some items are not so easily modeled. These are often called soft or indirect costs or benefits. What is the financial benefit of managing one supplier instead of two? How confident are we about our supplier switching costs, which no

Table 6.4 Costs and benefits of a supplier development project

Costs	Benefits
Salary and fringe benefits for an on-site engineer	Reduced quality defects and warranty costs
Travel and living expenses for an on-site engineer	Reduced inventory carrying costs at the buyer due to improved just-in-time delivery performance
Misc. administrative costs (negotiating a new contract, winding down the contract with the other supplier, etc.)	Lower supplier management costs due to reduced supply base
Direct financial support provided to supplier to purchase work cell equipment, including delivery of the equipment and facility change and setup charges	Reduced supply chain costs due to the elimination of one supplier (fewer material releases, less receiving, material handling, accounts payable, etc.)
	Lower per unit purchase price due to purchasing economies at the supplier, machine efficiencies, and reduced material handling costs from improved layout and flow at the supplier

accounting system actually tracks? What is the financial value of fewer defects and improved on-time delivery performance? Are there any indirect or second-order benefits that are not included? For example, would more reliable deliveries lessen the need for safety stock, thereby resulting in lower inventory carrying charges? And, let's not forget, we are looking years into the future. The longer our time horizon becomes, the less confident we are in our projections.

The next chapter will include figures for the items presented in Table 6.4. You will be able to analyze this project from a financial investment perspective and determine its expected gain or loss. Not only will you be able to provide an objective answer regarding the projected worth of this project, you will also feel good about taking another large step toward understanding the combined worlds of finance and supply chain management.

A Returnable Container Project

A second example involves a more complex, but also more traditional type of capital investment project. This example involves a returnable container project, something that would likely be treated as a capital project given the level of expenditures and the expected life of the capital assets.

A returnable container, usually made of steel or reinforced plastic, is a container intended for repeated use. Some will interchange the terms returnable and reusable. Unlike corrugated shipping containers that are intended for a single or relatively few trips before being disposed of or recycled, returnable containers are intended to return to their point of origin in something called a closed-loop system. It is not unusual for returnable containers to have a three-to-five-year useful life span. We will build this life cycle directly into our financial model.

A critical part of this project centers on the required number of containers. This question is important because too few containers moving through a system means that corrugated containers must compensate for any shortfalls. Too many containers will result in holding returnable containers that are not being used efficiently. Perhaps most important, the number of containers purchased is also going to represent the largest part of the capital investment. This question, while important, is outside the scope of this example. Our objective is to illustrate the use of financial investment techniques to model the project costs and benefits. Other sources discuss how to estimate the number of containers to populate within a system.[6]

A major issue involves how to get the containers back to their originating point. After all, these are called *returnable* containers. Let's consider this question using a Midwest company that has an aftermarket distribution network. This company delivers its smaller and medium size replenishment items to its regional centers via trucks using returnable containers. It sends its oversized and large sheet metal parts to these same regional centers via rail cars. After a regional

facility puts away the replenishment parts, the rail cars are reloaded with returnable containers, returnable racks, and other miscellaneous items, such as warranty parts. The rail cars then make their way back to the rail yard. The rail cars with the returns and containers are then forwarded to the national facility from which they originated. The returnable containers are then unloaded and refilled with replenishment inventory to make another trip on a truck. In lean terminology this network is called a closed-loop system. Any costs incurred to return containers back to their originating point should be part of the financial analysis, although in this case, there are no specific charges to return rail cars back to their originating location. The charge is embedded in the freight rate.

Identifying Cost and Benefit Categories

By now you should realize that the financial evaluation of any project requires a detailed assessment of the individual cost and benefits associated with that project. Table 6.5 identifies the cost and benefit categories that we should model in our investment analysis for a returnable container project. As this table shows, the expected benefits from returnable containers go far beyond simply eliminating the material and labor costs associated with corrugated containers. We know that many investment projects overlook some benefits or exclude them from the analysis because they are too hard to model quantitatively. A major challenge when evaluating a returnable container project, or any capital project for that matter, is identifying the savings that result from the new system.

Assuming that reliable data are available, the actual assessment of a returnable container project is usually not as complex as other projects or financial investments. In the author's experience, the project is usually not being compared against any other options except the status quo, which is the continued use of corrugated shipping containers. Because corrugated containers and wooden pallets are replaced by returnable containers, it is legitimate to treat the elimination of corrugated containers and pallets as a benefit. This represents a legitimate cost avoidance due to the use of returnable containers, which Table 6.5 includes.

Each benefit and cost from a returnable container system must be quantified or modeled before finalizing the financial evaluation. This will involve, at a minimum, the participation of finance, transportation, purchasing, operations, and industrial engineering. Each will bring some relevant information to the table to help arrive at the net savings from a returnable container project. Chapter 7 will extend Table 6.5 by providing cost and benefit data for this example.

Quantifying Benefits

Consider just one of the benefit categories that we might overlook when crafting a financial investment analysis—better trailer utilization. Better trailer or cube

Table 6.5 Costs and benefits of a returnable container program

Costs	Benefits: At the National Distribution Center
Returnable container costs	Elimination of corrugated container material costs (corrugated, nails, wooden pallets)
Replacement container panels	Elimination of corrugated container labor costs required for constructing the shipping containers
Administrative project costs (packaging, engineering, purchasing, staff time)	Better space utilization of loading lanes at national distribution center due to higher load stacking
Loading returnable containers on rail cars at the regional centers	Reduced trailer loading costs at national distribution center due to fewer trailer setups
Unloading of containers at national distribution center from returning rail cars	Reduced yard congestion and trailer handling at the national distribution center due to fewer trailers
	Benefits: In-transit
	Reduced transportation costs due to better trailer cube utilization
	Reduced in-transit damage
	Benefits: At the Regional Distribution Centers
	Reduced receiving costs due to fewer total trailers processed
	Reduced trailer unloading costs at regional centers due to fewer unloading setups
	Elimination of corrugated disposal costs (labor, container break down, hauling away) at regional facilities
	Reduced yard congestion and trailer handling at regional centers due to fewer trailers
	Corporate Benefit
	Tax savings resulting from depreciation of capital investment

utilization goes a long way toward making the financial case for returnable containers, but only if we include it in the analysis. It would be a serious error to overlook the impact of better trailer utilization, just as it would be a mistake to overlook the other benefit categories presented in Table 6.5.

Why is trailer or cube utilization improved when using returnable shipping containers? Returnable containers allow the stacking of loads three high rather than only two high in a trailer. Corrugated containers affixed to wooden pallets are usually not stacked three high, especially over longer distances because pallets shift during transit or their weight causes loads to collapse. The returnable containers also nest securely on top of each other, somewhat like Lego blocks

connected together. This prevents the crushing and shifting of loads, which eliminates the cost of damaged parts, as well as the labor involved with sorting through damaged loads. The bottom line is that better utilization due to returnable containers means fewer trailers shipped to the regional facilities.

Consider the financial cash flow benefits that result from better utilization. One of the regional facilities (out of 14 in the network) received an average of 8 trailers per week, or around 400 trailers per year, from the national distribution center prior to switching to returnable containers. After switching, this facility now receives around 10 percent fewer trailers each week, and the items received are rarely damaged. Transportation freight savings at this facility amounted to $100,000 annually ($2,500 freight cost to ship a trailer × 40 fewer trailers per year). And this is only the savings from one of the smaller facilities in this network! Aggregating the transportation savings across the 14 regional facilities helps justify this company's investment in returnable containers.

CONCLUDING THOUGHTS

The world of finance deals extensively with investments while the world of SCM deals extensively with expenses. If we plan on interacting with finance, then we need to think in terms of investments and investment analysis wherever possible. Doing so means feeling comfortable with applying financial evaluation techniques. The next chapter allows the reader to apply directly the concepts and approaches presented in this chapter. It is time to take another step forward in your growth as a supply chain financial manager.

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