Introduction to the SCOR Function of Plan

Chapter 3

Strategies: Developing Strategy and Converting Strategy to Actions Through Decision Making

In Chapter 1 we looked at the foundations and history of Operations Management. In this chapter we will look at the link between Operations Management systems and Strategy and Decision Making. To lead the processes that are involved in the production of a product or delivering a service, a company must have a long-term strategy and must make the right decisions. A company's strategy may define its competitive advantage.

Mission/Vision/Strategy

What is strategy? How does a company develop strategy? Why does a company need a strategy? What is a core competency? What is a competitive advantage and how does a company develop a strategy and a competitive advantage? Does a competitive advantage differ from a core competency? What is a core competency and why is that important to operations management?

Let's start by looking at some definitions to lay the foundation for our discussion of strategies and decision making.

- **Mission**: This is what the company does. The mission of The University of Kansas is "To educate future leaders."

- **Strategy**: according to dictionary.com, "a plan, method, or series of maneuvers or stratagems for obtaining a specific goal or result."[19] The Merriam-Webster Dictionary defines strategy as: "the art of devising or employing plans or stratagems toward a goal."[20] For our discussion of strategies in operations management, this definition provides a good starting point.

- The APICS Dictionary app defines strategy as "how to satisfy customers, how to grow the business, how to compete in it environment, how to manage the organization and develop capabilities with the business, and how to achieve financial objectives."[21] The APICS Dictionary ties the term strategy to strategic plan and defines that as "The plan for how to marshal and determine actions to support the mission, goals, and objectives of the organization."

- **Decision making**: "the cognitive process of reaching a decision."[22] A company's leadership needs to have a cognitive process to guide them to making decisions. In this chapter we will look at decision making under uncertainty—when we really have no idea of what will happen in the future; and we will look at decision making under certainty—where we have some idea of what may happen in the future.

- **Core Competency**: "a defined level of expertise that is essential or fundamental to a particular job; the primary area of expertise; specialty; the expertise that allows an organization or individual to beat its competitors."[23] For our

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[19] Strategy. Dictionary.com. *Dictionary.com Unabridged (v 1.1)*. Random House, Inc. http://dictionary.reference.com/browse/strategy . Retrieved July 20, 2020

[20] Strategy, http://www.merriam-webster.com/dictionary/strategy. Retrieved July 20, 2020.

[21] APICS Dictionary, 2020.

[22] Decision Making. (n.d.). *WordNet® 3.0*. Retrieved September 21, 2019, from Dictionary.com website: http://dictionary.reference.com/browse/Decision Making

[23] Core competency. (n.d.). *Dictionary.com's 21st Century Lexicon*. Retrieved September 21, 2019, from Dictionary.com website: http://dictionary.reference.com/browse/Core competency

discussions, a core competency is that area that a company excels at and does better than the competition. The latter part of the definition: "the expertise that allows an organization or individual to beat it competitors," best fits our discussions.

- **Vision**: The best definition I could find of a business vision comes from a former professor of mine, Gene McCoy. Gene defined the business vision as where the company wants to be in the future. With this as a definition, Gene also, viewed the strategy as the leader's bridge between the "as is" situation, where the company is today and the destination situation or where the company will be in the future (the vision).

In the first chapter of the *Art of War*, Sun Tzu states, "The Way is what causes the people to have the same thinking as their superiors" (Sonshi, 2012). The vision and the corresponding strategy of the company is "the Way" that Sun Tzu speaks about that allows all of the members of the company to understand the thinking of the leadership.

A company's strategy is the road map that guides the direction of a company. Just as a road map and plan are needed to make a family vacation or trip to the beach successful, a company needs this same road map to get the company to its destination. Without a map or plan, you will not get to where you are going or know you are there when you get there. Without a strategy to guide the company, the company will not reach its goals or destination.

If you get lost or do not reach your destination, you can stop and ask for directions to get back on track. If a company does not have a map to lead them to excellence and profitability, they cannot simply stop and ask directions and there is no Garmin or GPS to guide the company as there is for the boat or family car.

And long enough without a viable strategy may very well result in the collapse of the company. In the military the lack of a strategy leads to defeat, in business the lack of a strategy leads to corporate defeat. A good corporate strategy is as important to the success of the corporation as a good military strategy is to the battlefield commander.

A company's strategy and core competency may focus on short delivery times, speed to market, quality products, or simply cost. A company's core competency and strategy determine how the company will position itself. In order to properly position the company another key aspect is necessary—what does the customer want? The first step of the Motorola approach to Six Sigma is Define. Define who the customer is; define what the customer wants; and define how we can service the customer better than the competition.

SWOT Analysis

Another way of determining our strategy and meeting the customers' requirements is through a SWOT Analysis. Just what is a SWOT analysis? SWOT is an acronym that stands for Strengths, Weaknesses, Opportunities, and Threats. This analysis will assist the company in a variety of ways. An example of a SWOT format is shown in Figure 3.1. The key to a successful SWOT analysis is to be brutally honest. This sometimes makes a SWOT analysis an ugly exercise in companies. Everyone loves to hear what they are strong at but get emotionally upset when you try to identify weaknesses.

Internal to the Company	Strengths:	Weaknesses:
External to the Company	Opportunities:	Threats:

Figure3.2: SWOT Analysis

The strengths part of the SWOT analysis will help the company to truly identify what their strengths are. Obviously, the strengths of the company better include those areas that the leadership of the company has previously identified as the core competencies of the company. If the company has not already identified their core competencies, an accurate and detailed strength analysis will identify those areas of the company that are the core competencies. The preferred methodology is to identify the core competencies prior to the SWOT analysis.

Strengths identified by the SWOT analysis may include brand awareness or company reputation. In the 1980s and 1990s the brand reputation of IBM resulted in a situation where regardless how much was spent on computers, if they were IBM, no one complained. Apple enjoys the same brand reputation today in many companies. Another strength that should be discovered in the SWOT analysis may the company's real estate value. K-Mart discovered this a few years ago, thus giving the company a new advantage in the marketplace allowing them to buy Sears. Amazingly, in the late 1990s Sears contemplated buying K-Mart and decided it was not a good acquisition. History now shows that the acquisition of Sears by K-Mart was not a good acquisition either as the K-Mart real estate was not always in desirable locations and the debt and lack of customer service coupled to kill both K-Mart and Sears. Which is amazing when you consider that into the early 1980s, Sears was the largest retailer in the world. A company's products and or patents should be a strength identified in the SWOT analysis. Although as A.H. Robbins learned with the Dalkon Shield, sometimes the patent or product is a weakness.[24]

The weaknesses analysis should identify those areas that are not core competencies. A thorough SWOT analysis may very well identify an area that the leadership thought was a core competency that in actuality is not a core competency at all and may be a candidate for a process improvement program or contracting out (we will discuss this concept in greater detail in another chapter). The purpose of the weakness portion of the SWOT analysis is to identify those areas within the business or corporation that is not a strength that may need additional focus and attention in order to convert that particular area into a strength. Not every weakness needs to be

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[24] A.H. Robbins purchased Dalkon, the developer of an Inter-Uterine Device (IUD) and continued the development, testing, and eventual sale of the Dalkon Shield IUD. The tests showed that the IUD caused uterine and cervical cancer in the test animals but was discounted as an anomaly. In fact, the Dalkon Shield was later proven to have a causation effect in the development of uterine cancer in humans and the result was very large class action suit and settlement charges as a result of the numbers of uterine cancer caused by the Dalkon Shield. This should have surfaced during the SWOT analysis prior to buying the company and could have preserved one of the oldest pharmaceutical companies in the United States.

outsourced or contracted out. Some weaknesses may be the result of a lack of emphasis by the management or leadership of the company. We all know that we only do well the things that are either on the annual performance appraisal or that the boss checks on. A weakness may just need attention in order to turn it into a strength. Because of this, the SWOT analysis, contrary to some text books, is not a onetime analysis; the SWOT is another form of continuous process improvement.

Weaknesses identified in the SWOT analysis may identify the weakness of the brand. A potential weakness may be the ability to get products to the market or access to distribution systems. This weakness certainly raised its ugly head during the COVID-19 pandemic when companies demonstrated a weakness for getting products to the stores. Recent experiences off the coast of East Africa with piracy may indicate a weakness in the routes used to get products to market. This form of weakness—supply chain security—will be addressed in detail in another chapter.

Strengths and Weaknesses can be looked at from a personal perspective as well. Strengths are those skills that you bring to the table that make you more qualified than other candidates for a job. Weaknesses are those personal areas you need to improve on. For example, if you are multi-lingual then that is a strength and if you do not speak another language, that may be considered a weakness.

Where the strengths and weaknesses portion of the SWOT are internal looking analyses, the rest of the SWOT—opportunities and threats—are external looks at the company.

The opportunities portion of the SWOT analysis is conducted to identify those areas or products/services that we have the capability to produce or provide to improve our company. These may fall into one of four categories—they may be weaknesses of the competition and thus a way to expand market share or introduce new products or services; the opportunities may be areas that we have fallen behind the competition but have the strengths identified earlier in the SWOT analysis to compete in that market; the opportunity identified by an unmet customer need; or, the opportunity to take over or acquire a competitor or other aspect of business. This can be seen in the mergers of package delivery companies and the formation of the Amazon delivery system to compete with UPS/FedEx/USPS/DHL.

The threats analysis is a wider area than the first three phases of the SWOT analysis. In this phase of the SWOT, the company needs to identify those areas where the competition is stronger and therefore may identify an area of weakness that may impact the profitability of the company. An area of threats that is important, especially if conducting this analysis on supply chains, is the concept of security threats and risk analysis. We will cover both of these topics in the chapter on supply chain security. During the threats analysis a company needs to look at the entire operations management chain for weak links and threats to the strength of the operations management chain. One threat that may be revealed by a detailed SWOT analysis is a change in customer preferences for the company's products.

The SWOT is useful in helping the company leadership prepare for the development of the corporate strategy. The strategy is where the leadership sees the company in the future. The strengths, weaknesses, opportunities, and threats identified will assist in shaping the future of the company. The key to SWOT analyses is to be brutally honest. This sometimes creates issues with companies. Everyone loves to hear what they do well, but no one wants to hear that they are not as good at something than they thought they were.

The SWOT analysis is also a valuable tool for personal analysis. Everyone, especially those moving to the workforce, should conduct an honest and thorough personal SWOT analysis to identify personal strengths and weaknesses and those opportunities and threats that should be considered in the work place and job search. We will discuss this form of SWOT analysis in the class discussions.

STEEPLE Analysis

Another popular tool to assist companies in analyzing the external environment and developing strategy is known as the STEEPLE Analysis. STEEPLE is an acronym for:

Social – What is the societal view of our products or services? How does society view the company? What is the view of the company's policies?

Technological – What is out there for technology? What do we have? What should we add to our company to be competitive with our competitors? Is our technology obsolete?

Environmental – What impacts does our company and products have on the environment? What can we do better to be a better steward of the environment? What is the competition doing that impact the environment? Is the move to sustainability or the circular economy impacting how you do business?

Economic – Where are we in the business cycle and how is the economic picture affecting our company? How is the pandemic affecting your company?

Political – What are potential political actions that may impact our operations? Is the competition supporting some political action? Are the actions of the parties in power impacting your business?

Legal – Are there any legal implications that may arise from our actions (refer to the previous discussion of the Dalkon Shield)? Are there laws in the areas that we want to expand to that may impact our operations? Wal-Mart discovered that local laws in China required them to buy a certain percentage of their products from the local merchants. Are there any new laws that are going into effect that will impact your company?

Ethical – This should always be part of any strategy and decision making. Are the actions we are planning ethical and will the public perceive them as ethical actions? Or, is your company doing the easy wrong rather than the harder right?

What exactly is strategy? Dictionary.com defines strategy as, "a plan, method, or series of maneuvers or stratagems for obtaining a specific goal or result."[25] For a company, this plan or method leads to the goals of the leadership for the direction that they want the company to take for the future. Strategy should include goals and plans for expansion or retrenchment for the company, growth for the company products, what the products for the company will be in the future and the focus of the company. Does every company need a strategy? Absolutely! Without a strategy the company will be much like a rudderless ship moving in whatever direction the wind or current pushes it.

Once the leadership of the company sets the strategy and direction for the company, it has to be communicated to the workforce and the shareholders. This is accomplished through the vision of the leadership. The vision is the method of communicating where the company is (as is situation), where the company is going (destination situation) and how the strategy the company will use to get there.

Often companies confuse vision and mission. The vision is where the company will be in the future. The corporate mission states the reason for the existence of the organization. This statement provides the customers, the employees, and the shareholders a clear statement of that

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[25] strategy. (n.d.). *Dictionary.com Unabridged*. Retrieved October 02, 2009, from Dictionary.com website: http://dictionary.reference.com/browse/strategy

purpose. The corporate mission coupled with the strategy to accomplish the mission serve as guides for decision making. We will look at decision making models later in this chapter.

Here are a couple of examples of company mission statements:

- Google: to organize the world's information and make it universally accessible and useful

- Apple: to bring the best personal computing experience to consumers around the world through its innovative hardware, software and Internet offerings

The vision and the guidance of how to accomplish the mission and goals of the company have to be clearly stated, clearly communicated, and clearly understood by the workforce that has to implement the strategy and vision. This is similar to one of Covey's "7 Habits of Highly Effective People"—seek first to understand and then be understood. Just because it makes sense to you does not mean that it will make sense to your workers.

Why is a clearly stated vision necessary? Every employee in every organization needs to know the mission, vision and strategy of the company. It needs to be clearly stated, clearly articulated, and clearly understood by everyone in the company and should be understood by the suppliers. Look at the guidance of Yogi Berra— "When you come to a fork, take it." I am sure that was clear to Yogi when he said it but could be somewhat confusing. Outside of Raleigh, North Carolina when I was growing up was a small crossroads village known as Six Forks (this crossroads is well inside the city limits today). As the name would imply, at Six Forks you could go six different directions. At that time you could go to Raleigh, Durham, Creedmore, Wake Forest, Oxford, or the middle of nowhere. Choosing the wrong fork could put you miles into the middle of nowhere before you realized that you chose the wrong fork. The crossroads still exists within the Raleigh City Limits; and you can still go six different directions. Although none of them no longer leads into the middle of nowhere, using Yogi's guidance, which fork do you take? There was also a shopping and residential area in Raleigh called Five Points. As that name implied there were five different roads that came together – which fork you take depends on where you want to go.

In 1962, President John Kennedy made his famous proclamation, "We endeavor to go to the moon and return safely by the end of this decade." This vision seemed quite clear to the President, was seen as ridiculous by many because of the problems with getting a man into space at all and was perceived as quite clear by the folks at McDonnell, Douglas (later McDonnell-Douglas) and Rockwell as achievable. On July 16, 1969, the first man stepped on the moon and all three astronauts in the Apollo Spacecraft returned safely to earth.

In *The Art of War,* Sun Tzu states, “one who is confused in purpose cannot respond to his enemy.” The vision is the way corporate leaders ensure that their employees know what their purpose is. Although the customer is not the enemy, if the employee does not understand the vision of the company, there is no way she/he can respond to the needs of the customer.

Compare Yogi Berra’s guidance with the analysis of General U.S. Grant by one of his aides after the American Civil War. General Grant had pretty much been a failure at everything he attempted, except for being a drunk, prior to being called back to active duty in the US Army at the start of the American Civil War. After the war, one of his aides was questioned about how General Grant went from failure to becoming the greatest battlefield commander in the US Army. General Grant’s aide said what made the General so successful was that he made sure that his subordinates knew “exactly what he wanted, why he wanted it and when he wanted it.”

Think about that for a second. How much easier would life be if our bosses made sure that we knew exactly what they wanted done (not how), when it had to be done and why we were doing it? For that matter, think about college. How much more rewarding and easier would your studies be if you knew exactly what was expected of you, why it was expected (how to use it or why it is important) and when you had to do it by?

The key with the vision is that not only must the vision be vital to the organization and the direction that the company needs to take; it also needs to be perceived as achievable by the people that have to implement it. Some years ago the US Army established goals and a vision of where the leadership wanted to take the supply chain operations. The goals were imperative to prevent outside intervention in attempting to improving operations.[26] Unfortunately, for the first two years of this program the goals for US Army had one set of goals for the entire Army. At the time, the Army was divided into two major components—the Active Army (those soldiers that

[26] Just like most companies, the US Army has a board of directors. In the case of the US Army, the board of directors number 535—the 100 US Senators and the 435 members of the House of Representatives. As most taxpayers know, it is better to keep this board of directors out of any business.

were full time soldiers and worked every day in the Army's supply chain operations) and the US Army Reserves/Army National Guard (those soldiers that had other full time jobs and only worked as soldiers two days a month and 14 days in the summer). One set of goals for both components did not work. The Active Army perceived the goals as achievable, but the Reserves and National Guard did not perceive the goals as achievable and went the wrong direction with order processing times. It was not until two years later that a separate set of goals were established that everyone perceived the goals as achievable and started making progress in the right direction. In fact, the Reserve Components exceeded the goals for the Active Army when they perceived their goals as achievable. This is the second part of a successful vision, not only is it clearly stated, clearly articulated and clearly understood; it has to be perceived as achievable if the vision and strategy are to be successful.

How does your strategy tie to a competitive advantage for your company and how does that tie to operations management? A company's strategy also looks at how a company is going to be positioned. How the leadership decides to position a firm may very well determine if the company is going to be competitive.

This competitiveness goes back to the first step of Six Sigma—defining who the customer is, what the company can do to meet what the customer wants, and how to do it better than the competition. Creating a competitive advantage for the company includes:

Traditional Positioning Strategies:

- Flexibility. If a company is competing on flexibility has to possess the ability to change rapidly between products; have to offer the customer various options; has to be adaptable to change; must offer the customer a wide variety of products, options, and models. In order to this, a company competing on flexibility has to possess the capability to cross train their personnel to accomplish various missions and make the wide variety of models and options to meet the customers' demands.
- Quality. In order to compete on quality, the entire organization must focus on quality—this will be discussed in greater detail in the chapter on Quality. In order to compete on quality or use quality as the way to position the company, the company has to know what

the customer wants and how the customer defines quality. Competing on quality—real or perceived—has its roots in the works of Dr. W. Edwards Deming and the quality revolution based on the techniques that the Japanese learned from Dr. Deming. Certain brand names such as Mercedes-Benz, Cadillac, IBM, Rolex, and Dell are considered quality products based on the brand reputation. Ritz Carlton hotels compete on the quality of customer care coupled with luxury.

I had the opportunity to do a couple of seminars at the Ritz Carlton in Pasadena, California. The first year that I did the seminar, there were no problems. I drove my Ford Escort to the front door—not exactly the standard car at a Ritz Carlton. I did notice that when I went for my evening run that my car was parked on the lowest level of the parking deck out of sight of the road or front door.

The second year I was there I was greeted by the front desk by name, welcomed back to the hotel and made to feel very welcome. I did encounter a small problem and not because I drove my little Escort again. When I returned from the evening session and dinner, I found my key card did not work. My first thought was that after a glass or three of wine that I was at the wrong room. A quick check showed I was at the right room but the key card did not work. Suspecting that the card may have been demagnetized, I went to the front desk and got a new card. The new card did not work either. I called the front desk from the hall phone and an Assistant Manager came up only to discover that his master key card did not work either—seems when the battery in the door goes out, no matter how hard to yank on the door or kick the door it will not open or how high you are in the management if the battery is dead you access card still will not work. Having had a similar experience in Florida a few years earlier, I was aware that the door will not budge when the battery in the lock is dead. (A few of my former students had the same problem at a hotel in Panama the semester after having heard this story and had a similar experience getting the battery changed).

After finding a maintenance man to fix the door, I finally got into the room an hour later. Because of the inconvenience, I was given a free breakfast (about $25, which was part of the contract for my seminar anyway) and a bottle of wine (worth about $35). It seems that the Ritz Carlton chain has a policy to do whatever it takes to make the customer happy and employees can spend up to $1500 to make the guest’s experience a good one. There are reports of opening the kitchen after hours to make food for late arriving guests. This is one way that the Ritz Carlton chain strives for quality and positions themselves apart from their competition. Had I known at the time that the manager could have spent up to $1500 to make me happy, I would have had a round of golf, a massage at the Spa, and my free breakfast and bottle of wine.

- Speed. Competing on time is critical in supply chains. FedEx,[27] UPS,[28] DHL, and the US Postal Service have determined that competing on speed is critical to the positioning of their companies. In order to compete on speed a company has to walk their processes, identify non-value-adding processes and measuring the time for every process in the supply chain or manufacturing chain. Streamlining the process and reducing wasted movement, wasted waiting time, and wasted production quantities are necessary in order to compete on speed. Speed and time are relative terms and FedEx and UPS have defined time spans to meet the time requirements of the customer. Amazingly, some companies have stopped some of their on-time guarantees in the face of the COVID panemic.

- Price/Cost. To compete on cost or price a company must reduce waste in the processes. Just like the competition on time, you cannot compete on cost if there are inefficiencies and waste in your system. Every process adds cost but not every process adds value. To identify these non-value-adding processes requires walking the process and identifying non-value-added processes—a good process map is necessary to accomplish this (we will discuss process mapping and value chain mapping in greater detail in another chapter). It is also important to point out that after walking the process and identifying these non-value-added processes, improvements must be put in place and not just changes for the sake of change. The difference here is that every improvement is a change, but not every change is an improvement. Some managers come in and have to change everything that

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[27] Go to Fedex.com to see how they compete on speed and time.

[28] To compare UPS to FedEx, go to UPS.com

their predecessor did just to make a mark on the operations. This usually impacts the entire operations management chain.

Southwest Airlines competes on cost successfully against the other major airlines. One of the ways Southwest is able to compete on cost is by flying one type of airplane for the entire fleet. This facilitates easy and rapid crew changes because of the familiarity of the equipment; one type of aircraft eases the record-keeping by having only one format of books; simplifies the maintenance operations because only one set of mechanics is necessary; and inventory costs are reduced because Southwest only has to maintain repair and service parts for the Boeing 737 rather than the wide variety of parts required to maintain multiple model fleets.

Southwest also reduces costs by having more direct flights. Fewer transfers of passengers mean fewer baggage transfers thus baggage handling costs and personnel. One other way that Southwest has cut costs is by changing the way reservations are made. Southwest saves $30 million annually in travel agent commissions by requiring customers to use the Southwest Web site to make reservations rather than paying the monies to other sites such as Expedia, Orbitz, and Travelocity.

- Hybrid Positioning Strategy. You can make a good argument that the traditional strategies are being mixed together is today's business environment. Amazon and Walmart are both trying to compete on speed, flexibility, and cost. While FedEx and UPS are competing on flexibility and speed by offering other services besides the basic freight options.

Are there other competitive opportunities in today's society and business world? What about electronic business and the Internet? Can this assist a company in developing a competitive advantage? Every brick and mortar business has to make a strategic decision on how to posture the company on the Internet and what aspects of electronic business the company should be part of. In today's business world if you are not doing business electronically, you will not be in business very long. The question is not a matter of if but how much of the company should be involved in electronic business and how much of the company should be involved in the brick and mortar portion of the company or should the company be totally electronic.

All of the other aspects of competitiveness and posturing discussed earlier also contribute to the competitiveness of an electronic commerce company. A company can have the sexiest Web site possible and still not be competitive on price, cost, speed, flexibility, or quality. In brick and mortar businesses, these competitive aspects may be mutually exclusive but in the electronic world they are not necessarily exclusive aspects of competition.

What about e-business? What advantages does that do for you? The biggest advantage is that it opens your product to a whole new market. Teaching a class provides the ideas to a class of students but putting the ideas in a book opens the doors to a new market. The Internet does the same for companies. Polo has eight Rugby stores located near college campuses. These stores only allow those students close to these stores to purchase the products, but putting the products online opens the market to everyone.

What are the theoretical and actual impacts of e-business and can you survive today without a Web presence?

Theoretically, doing business on the web should enable companies to:

- Provide better customer service—in actuality, fewer companies are providing quality customer service as a result of doing business on the Web. Some companies are content to sell products via e-commerce and never follow up with the customers. One prominent computer company has sold my company five computers over the past seven years and has bothered to follow up only once to see if I got what I ordered and was satisfied with the purchase. However, they are very good at letting me know when my extended warranty was expiring.
- Lower costs of materials—some companies do pass on the reduced costs of materials to their customers. These lower costs of materials are possible for several key reasons. The first reason that e-commerce provides the opportunity for lower costs is that companies can now find materials on the Web without having to travel to the source. Another reason for possible lower costs of materials is that the Internet now provides online market places and exchanges that allow companies to have alternatives and options to compare and bid on materials.
- One concrete advantage of e-commerce and the Internet is the availability of information that provides potentially better decision making. Prior to the advent of e-commerce and

the Internet, the only available information was in the catalogs or in the store. Gathering all the necessary information not in the catalogs required going to all the stores or sources of supply to see the products and compare them.

Examples of e-commerce success and lack of success are Toys-R-Us, Borders, and Barnes and Noble.com. Borders jumped into the e-business world with big fanfare while the competition Barnes and Noble took their time in developing the supply chain to support the e-business storefront. Today, Borders does not even exist. They blamed Amazon but interestingly enough, like Toys-R-Us, they outsourced their e-commerce to Amazon. Amazon started out to be a storefront with no assets but quickly discovered that owning the entire supply chain produced a competitive advantage. Wal-mart.com is another good example of capitalizing on the electronic business. In fact, Walmart reported a 74% increase in e-commerce during the first two months of the COVID-19 pandemic. The successful e-business companies are the ones with a successful supply chain to support their operations.

- Can your supply chain produce a competitive advantage for your company? We will discuss supply chain operations in a later chapter. However, the above discussion on electronic businesses shows that a good supply chain is necessary in order to be competitive. Lowe's believes that the competitive advantage that they have over The Home Depot is their supply chain operations.

  This may be true as Home Depot completely revamped their supply chain about ten years ago to compete more effectively against Lowe's and other home improvement companies. Lowe's did several things to improve their competitive advantage above and beyond the supply chain and improved their total operations management chain. Lowe's surveyed customers and determined that the majority of home improvement projects are designed or approved by the females in the household. To meet the needs of these customers, Lowe's added more pastel colors and more small appliances. Then they added more consumer electronics.
- Part of developing a competitive advantage is customer relationship management. What is it and why is it important? Customer relationship management is not a new concept. My uncle was a highly successful high-end furniture salesman. He maintained a deck of cards with all of the store salesmen that he called on, a card deck with the sales managers,

a card deck with the store owners' information. He used these cards to refresh his memory before calling on a store. The information enabled him to call the customers by name, remind him of their interests, and their birthdays. The goal and the results were a very successful career and loyal customers.

Customer Relationship Management has the goal of creating relationships with customers, know what the buying habits of the customer are and use that data to create "customized" offers to the customers. Amazon has taken this one step farther by using predictive analytics to stage items closer to customers when Amazon thinks they may be ready to buy a product based on past purchasing history.

Casinos have been doing predictive analysis with their slot club cards for decades. The goal of these cards is to develop trends to provide individual programs tailored to customers. Casinos use slot club cards as a way to capture customer data. Grocery stores do the same thing with their loyalty cards and credit cards. Cabela's initially went into the credit card business to gather data on where their customers were shopping and what the customers were buying that maybe should be stocked in Cabela's stores.

Decision Making and Operations Management

What does decision making have to do with Operations Management? Everything! Every aspect of the Operations Management Chain requires decisions. Decisions in Operations Management include:

- What products should the company make, buy, stock, or sell? What products should the company stop making?
- What services should the company provide to the customers?
- What processes should be used in the manufacture or delivery of a product or service?
- What capacity should the company have and how that capacity should be expanded and if it should be expanded?
- What type of personnel should be hired and how many personnel should be hired?

- What level of quality should the company aim for and how will the quality be measured?
- What type of facilities the company should have? And where should these facilities be?
- How should the company source parts, products, and materials? Where should these parts, components, and materials be sourced from?
- What markets should we be in?
- What are the companies that we can acquire?

The answers to these questions will be discussed in detail in the subsequent chapters. Decision making is inherent in all operations. This chapter will cover decision making and decision-making techniques.

Strategy Development and Decision Making

Included in the decision-making process is knowing if a decision is necessary; when a decision is necessary; and what needs to be decided. This concept is like the Theory of Constraints (we will look at the Theory of Constraints in greater detail under capacity discussions and continuous process improvement programs later in the course) premise that a decision maker needs to know what to change, when to change, and how to make the change. Decision making also includes knowing that there are consequences of decisions made. Here is an example of the consequences of decisions:

- When the decision is to drive after drinking there is a definite consequence. I made this example in one class only to have a student tell me the next week that he was picked up for suspected driving under the influence. I was surprised when he told me that after the arrest, he immediately thought about the comment made in class about consequences.

- A decision to use performance enhancing drugs has the unwanted consequence of failed drug tests and the shame and disgrace suffered by athletes that make this decision. Recent headlines involving baseball players, Olympic athletes, cyclists, and American football players confirm these consequences. The decision to use performance-enhancing drugs falls under the ethics umbrella, but now it also falls under legal ramifications.

The After Action Review Process

Included in decision making is the risk inherent in the making or not making a decision and the follow up on the results of the decision—did we make the right decision, and did we implement the right process or product? This includes using the After-Action Review process. The After Action Review is a staple in Military Operations. Every operation and every plan must be reviewed. The underlying concept of the After Action Review is that every operation has somethings that went right that need to be sustained in future operations and every operation has somethings that could be improved in future operations. The After Action Process uses the following steps:

1. What was the plan or decision? What did we do or what did we decide?
2. What actually happened? What was the outcome? Did it match the expectations from the decision?
3. What went right that needs to be sustained in future decisions or plans?
4. What went wrong and why? It is important to point out that this step looks at what went wrong not fixing blame to anyone. The goal is to fix the problem not the blame.
5. How can we prevent this from happening again in the future?
6. Who is responsible for the fix? This is the only "who" question in the process. The only reason a "who" is looked at here is that we all know that nothing gets done if someone is not checking on it. So, the purpose is to assign someone to ensure that the fix takes place. You will notice that the process does not try to fix blame, only fix issues to make things work better in the future operations.

If an organization conducts an After Action Review on a regular basis and makes this process part of their Standing Operating Procedures, the organization will continue to get better and achieve excellence.

Decision Making Models

The first model we will look at is known as the Military Decision Making Model. Do not get hung up on the title just the process. The Military Decision Making Model is very similar to the Scientific Decision Making Model and the Supply Chain Problem Solving Model designed by Tompkins and Associates, a very successful operations and supply chain consulting company.

The Goals of the Military Decision Making Model are:

- Analyze and compare multiple courses of action (alternative actions) to identify the best possible action
- Produce integration, coordination, and synchronization for any action or decision
- Minimize overlooking critical aspects—did we consider everything?
- Produce a detailed plan

The steps of the Military Decision Making Model are:

1. What is the mission or plan or decision that needs to be made? This mission/plan/decision may come from the boss or from the headquarters staff. To illustrate this process, we will use the mission of expanding/building a new distribution center.

2. Mission Analysis. Exactly what is the boss/headquarters asking us to do? What are the requirements from us to make this happen? What are the specified tasks? Specified tasks are those tasks that are specifically laid out in the guidance or directive from the boss/headquarters. What are the implied tasks? Implied tasks in this analysis are those steps that are not specifically dictated by the boss or headquarters but from your experience or the experience of your staff or coworkers are tasks that must be completed in order to accomplish the specified tasks.

   If the mission is to build a new distribution center, the specified task is to get a new distribution center built. The implied tasks include finding a suitable location, designing the new facility, and acquire all the necessary permits. It may just mean expanding the current facility.

For our example we will use the alternatives of expanding the current facility, moving to an existing facility, build a new facility, or do nothing.

3. Course of Action/Alternative Development. There is always more than one way to accomplish goals. In fact, the only place that you will ever find only one right or wrong answer is in academia. In the real world, there are options to consider when making a decision. Once the mission analysis is complete it is time to start developing courses of action or alternatives to solve the problem or guide the decision maker to making a better decision. Obviously, one course of action is to do nothing—this is not always a good alternative. I was had an instructor who used to emphasize that a person can make a decision or not make a decision and let someone make the decision for you. Doing nothing may fit into this category. In some instances, doing nothing may be a viable alternative.

   Each alternative or course of action must be distinctive from the other alternatives. Otherwise if the alternatives are not distinctive from the other alternatives, they are basically the same.

4. Once a set of alternatives or courses of action have been developed, it is time to analyze the courses of actions or alternatives. Are the alternatives really different? Figure 3.2 shows the qualities that differentiate alternatives.

COURSE OF ACTION (COA)/ALTERNATIVE QUALITIES

Suitability:
Does it accomplish the company's mission and comply with the boss' guidance?
Feasibility:
Does the company have the capability to accomplish the mission in terms of time, space, and resources?
Acceptability:
Does the cost justify the gain?
Distinguishability:
Does it significantly differ from other COAs
Completeness:
Who, What , When, Where, How, and Why

Figure 3.2: Alternative Qualities

5. After analyzing the courses or action, it is time to compare the alternatives. In order to compare the alternatives, it is necessary to establish the success criteria or decision criteria that are important to the desired outcomes. Using a grid and the success criteria of expanding operations, posturing the organization for the future and minimizing long term costs the comparison and analysis will look something like this:

Alternative Comparison and Analysis

Course of Action/Analysis	Expand operations	Posture for the future	Minimize life cycle costs
Do Nothing	-	-	-
Expand Current Facility	+	+	-
Build New Facility	+	+	+
Move into Existing Facility	+	-	+

For this example we will weight the expand operations and posture for the future criteria. Using these criteria and options, the choices are expand current facility or build a new facility. The tie breaker is the life cycle costs.

Figure 3.3 Comparison and Analysis

6. The next step in the process is to brief the boss on the analysis and recommend a solution to him/her to accomplish the mission. This is one model for decision making; in the next section we will look at some other decision making models.

Our courses of action appear to fit the criteria. They will accomplish the mission of providing more distribution space. We will assume at this point that they all are feasible given the current economic and business situations. They are distinguishable and seem to be acceptable given the mission.

Decision Making under Uncertainty

Not every situation will lend itself to the previous decision making model. In some business cases decisions must be made under uncertain conditions. In such a case the following technique may be used. This decision making model may not produce as good a decision as the Military Decision Making Model which is very similar to the Scientific Decision Making Model.

In this technique we will still use a grid to lay out the decision table showing the states of nature and the decision alternatives. The payoff table has three components:

a. The States of Nature across the top of the table. We have no control of these states of nature.

b. The decisions down the left hand side of the table. This is the only part of the table that we can control.

c. The projected payoffs. These are located at the intersection of the state of nature and the decision. For example, in the table below, the projected payoff for the decision to expand operations assuming a good economic condition is $50,000.

The payoffs for a craps table in a casino provide a good example of a payoff table. The craps table has various payoffs based on the number rolled and the probability of that number occurring. Obviously, the highest payoffs come from the hard ways because the hard ways have the smallest probability of occurring. Figure 3.4 is an example of a payoff table/decision matrix.

Payoff Table – Decision Making Under Uncertainty

Decision/State of Nature	Good Economic Conditions	Average Economic Conditions	Poor Economic Conditions
Expand Operations	50,000	175,000	5,000
Contract Operations	75,000	25,000	80,000
Maintain Status Quo	60,000	55,000	50,000

Figure 3.4 Decision Making Under Uncertainty Payoff Table

For this decision using the payoff table above, the following criteria could be used: maximax, maximin, or minimin. **Maximax** is the maximum of the maximum payoffs—a very optimistic approach much like betting on the hard ways; **Maximin** is the maximum of the minimum payoffs; and **Minimin** is the minimum of the minimum payoffs. In the above example these would be computed as follows:

Maximax: maximum payoff for expanding operations is state nature one—average economic conditions or $175,000; maximum payoff for contract operations is state of nature three—poor economic conditions or $80,000; and the maximum payoff for the maintain status quo is state of nature one or $60,000. The maximum of the maximum payoffs is expanding operations in average economic conditions. Therefore, without any additional information, the decision for maximax is to expand operations.

Maximin: The minimum payoff for option one is poor economic conditions or $5,000; the minimum payoff for option two is average economic conditions or $25,000; the minimum payoff for option three is poor economic conditions or $50,000. Therefore, the maximum of the minimum payoffs is option three—maintain status quo.

Minimin. Using the same minimum payoffs, this decision is to look for the minimum of the minimum payoffs. The minimum of the minimum payoffs is to expand operations and hope for poor economic conditions.

Decision Making under Certainty

The difference between decision making under uncertainty and under certainty is the addition of forecasts for the outcomes. These probabilities are the company's forecast of the probability of that particular state of nature occurring.

Look at this updated payoff tables in Figures 3.5a-3.5c with the addition of forecasted occurrence probabilities. The Expected Maximum Value (EMV) calculation is simply taking the state of nature probability x the payoff for each alternative and then adding across each row as shown in Figure 3.5a. Using EMV as the decision criteria, you will choose that alternative with the largest EMV.

The EMV is really a weighted average over time. So, you may make more over time or less over time depending on the frequency of the states of nature and the accuracy of the probability forecast for those states of nature.

Expected Maximum Values

Decision/State of Nature	Good Economic Conditions	Average Economic Conditions	Poor Economic Conditions	Expected Maximum Value
Expand Operations	50,000	175,000	5,000	61,000
Contract Operations	75,000	25,000	80,000	64,750
Maintain Status Quo	60,000	55,000	50,000	54,250
	0.3	0.25	0.45	

Expand operations: (0.3*50,000) + (.25*175,000)+(.45*5,000)
(probability Good x Payoff Good) + (probability Average x Payoff Average)
+ (Probability Poor x Payoff Poor)

Figure 3.5a Expected Maximum Value Calculation

Decision/State of Nature	Good Economic Conditions	Average Economic Conditions	Poor Economic Conditions	Expected Maximum Value
Expand Operations	50,000	175,000	5,000	61,000
Contract Operations	75,000	25,000	80,000	64,750
Maintain Status Quo	60,000	55,000	50,000	54,250
	0.3	0.25	0.45	

Figure 3.5b Expected Maximum Values

Decision/State of Nature	Good Economic Conditions	Average Economic Conditions	Poor Economic Conditions	Expected Maximum Value
Expand Operations	50,000	175,000	5,000	(B$5*B2)+(C$5*C2)+(D$5*D2)
Contract Operations	75,000	25,000	80,000	(B$5*B3)+(C$5*C3)+(D$5*D3)
Maintain Status Quo	60,000	55,000	50,000	(B$5*B4)+(C$5*C4)+(D$5*D4)
	0.3	0.25	0.45	

Figure 3.5c: The formulas for this calculation are shown in the this frame.

Expected Value with Perfect Information and the Value of Perfect Information

What if you could have perfect information on what the future holds for your company and the economy? Does that information exist? It may exist for the products of your company assuming that the marketing folks are doing their jobs correctly.

If that information is available, what would you be willing to pay for it? We are not talking about insider trading information here, what we are talking about is better economic forecasting or product acceptance forecasting. If such information was available, the most you should be willing to pay for it is the payoff with the perfect information less the maximum payoff you would have without the perfect information. This would be the value of the perfect information.

Using our previous calculation for the expected maximum value, we would choose to expand our operations. Would we make the same decision if we had perfect information? If perfect information was available, we would obviously choose the state of nature that gives us the highest expected payoff. The calculation for the expected value with perfect information is the probability of that state of nature multiplied by each of the payoffs for that state of nature all added together.

When we calculated the Expected Maximum Values, we used the probabilities and the payoffs across the rows for each alternative. The Expected Maximum Value could also be called the Expected Value with No Additional Information. For the Expected Value with Perfect Information we will use the probabilities and the largest payoff for each column or state of nature. Using the same payoff table, calculating for expected value with perfect information looks like this:

Decision/State of Nature	Good Economic Conditions	Average Economic Conditions	Poor Economic Conditions	Expected Maximum Value
Expand Operations	50,000	175,000	5,000	61000
Contract Operations	75,000	25,000	80,000	64750
Maintain Status Quo	60,000	55,000	50,000	54250
	0.3	**0.25**	**0.45**	
Expected Value with Perfect Information	22,500	43,750	36,000	102,250

For the first state of nature the calculation for the value of perfect information:
(0.3*75,000) = **$22,500**
For the second state of nature: (0.25*175,000) = **$43,750**
For the third state of nature: (0.45*80,000) = **$36,000**
So, EVPI = 22,500 + 43,750 + 36,000 = 102,250

Figure 3.6: Expected Value with Perfect Information Calculation

Perfect Information – Better Information

The next step is to calculate the value of the perfect information (VPI). This is the value that a company would be willing to pay to get perfect information about the future of their product. Realizing that there no perfect information what we are trying to find is how much more we can make with better information and what the information is worth to us in the form of additional income. This could be a stock picking model, a new marketing model, or a forecasting model for the economy. This is not to be confused with insider trading information. Perfect information in this example could be marketing information that tells us what the market thinks of our product or could be a refined forecast of the future business cycles based on improved forecasting techniques or trends that have emerged. How much should you be willing to pay for this information? This is the Value of Perfect Information. For my money, I really believe that the only real value to this calculation is to let me know how much I should be willing to spend up to in order to get this better information. The calculation for this value is relatively easy:

The Value of Perfect Information = the Expected Value with Perfect Information – the Largest Maximum Expected Value:

VPI = EVPI – Largest EMV

Decision/State of Nature	**Good Economic Conditions**	**Average Economic Conditions**	**Poor Economic Conditions**	**Expected Maximum Value**
Expand Operations	50,000	175,000	5,000	61,000
Contract Operations	75,000	25,000	80,000	64,750
Maintain Status Quo	60,000	55,000	50,000	54,250
	0.3	**0.25**	**0.45**	
Expected Value with Perfect Information **VPI = EVPI – Max EMV** **= 102,250 – 64,700** **= 37,550**	15,000	43,750	36,000	**102,250**

Figure 3.7 Putting the EVPI/EMV/VPI all together

Therefore, in this example an investor or company should not be willing to spend more than $37,550 to get better information.

Summary

The strategy of the company is communicated to the company through the vision of the company's leaders. The direction of the company should be based on the missions of the company, the vision of the leadership, the core competencies of the company, and the results of the Strengths, Weaknesses, Opportunities, and Threats Analysis. This analysis will help the company identify those areas internally that are strengths and weaknesses and the external opportunities and threats. These areas will help shape the strategy of the company and how the company will position itself to be competitive in the marketplace.

Decision making includes the understanding that there are consequences that go along with the decisions. In this chapter we looked at the idea of the consequences that go along with making the decision to drive after drinking. The same is true for companies.

A model for comparing courses of action was developed in the chapter and a refined methodology was presented to assist leaders in making decisions under uncertainty and when more certainty is known.

Decision-making models are not designed to think for the decision maker. Decision-making models help the decision maker make a better informed decision. There is no exact science to decision making. A decision maker should use all information and tools at his/her disposal to help make the best possible decision while realizing that there are consequences to both good and bad decisions.

Questions for Chapter 3

1. Organizations exist
   a. To provide employment opportunities
   b. To meet the needs of society that people working alone cannot
   c. To produce goods in limited quantities
   d. To access the equipment and technology in order to produce goods and services.
   e. All of the above
   f. b and d

2. Operations involves:
   a. The distribution of company products.
   b. The production of goods and services.
   c. Obtaining people, capital and materials.
   d. Accounting, marketing, finance and engineering
   e. All of the above
   f. a, b, and c

3. Production and operations management is:
   a. Managing a company's level of inventory
   b. Managing the inputs to a production process.
   c. Managing the people who work in manufacturing companies.
   d. Managing the transformation process that produces goods and services.
   e. All of the above
   f. a. and d. only

4. Operations managers apply ideas and knowledge in order to
   a. Cut production time to speed new products to market.
   b. Improve flexibility to meet rapidly changing customer needs.

c. Enhance product quality and customer services.
d. All of the above
e. None of the above
f. Only a. and b.

5. Inputs to the transformation process of operations include:
a. Goods and services.
b. Accounting, finance, engineering, and marketing.
c. Production planning, inventory control, and quality management.
d. People, capital, and material.
e. All of the above

6. The outputs of the transformation process of operations are:
a. Accounting, finance, engineering, and marketing
b. Production planning, inventory control, and quality management.
c. Goods and services.
d. People, capital, and material.
e. All of the above

7. An important difference between goods and services is:
a. Only goods are tangible
b. Only goods are produced using materials and equipment.
c. Only services are produced according to customer needs.
d. all of the above
e. None of the above

8. Ethics are set of standards that are generally:
a. Lower than what is legal.
b. Higher than what is legal.
c. Equal to what is legal.
d. Not considered in product safety.

e. a. and d.

f. None of the above.

9. Productivity is the ratio of inputs consumed divided by the outputs achieved.

a. True

b. False

10. An important step in developing a strategic plan is:

a. Short-range forecasting.

b. Measuring productivity.

c. Working with suppliers on product design.

d. Assessing the organization’s strengths and weaknesses.

11. What is the maximax decision making criteria?
12. Think about maximax as an optimistic decision criterion; is it possible to be disappointed if this criterion is the basis for a decision from a payoff table? Why?
13. What is the significance of the point of indifference?
14. What is the purpose of the Expected Value of Perfect Information?
15. How do you calculate the Value of Perfect Information?