In order to develop excellent systems that support an organization, one must understand the variables that affect an organization and their relative value or importance. In section II of module 1, we present the organization model that will help you understand the many variables that impact an organization. This model should provide the basis for understanding the organization, which is crucial to any systems development activities.

An individual who is considering starting a business must write a **business plan** that describes the many variables that will affect the business and must be considered in detail and documented. The plan serves a number of purposes:

1. To ensure that the entrepreneur understands all of the variables that can affect the business, as well as the specifics of each variable, such as "Who are the competitors?"
2. Provide the details of the business when communicating to others for advice, financing, or support of the business. These details demonstrate that the entrepreneur understands the interrelationships between expenses and revenue.
3. Provide a tool to monitor the business's progress in accordance with the plan so that adjustments can be made based on actual performance.

The importance of the various variables is not the same for all businesses, but their actual importance to the specific business, and strategies to deal with them, must be documented and explained in the business plan. Understanding the organization model serves the same purposes in systems development. It is important to understand these factors to ensure that information systems effectively support the business plan.

The organization model presented below is a general graphical representation of a business with all of the variables that can affect a business. Since all of the variables will affect all businesses to varying degrees, the crucial role of the model is to identify their importance and help the business develop a strategy for dealing with each set of important variables. To graphically identify the importance and relationship to the organization, the thickness of the connecting arrow is used. The direction that the arrow is pointing indicates whether the variable impacts the organization, or if the organization can affect the variable, or both. A good example might be competition. The actions or size of the competition can affect the organization, while the strategy used by the organization could affect the competitors and force them to make changes.

Some of the indirect uncontrollable variables do not have arrows because their specific impact is difficult to identify at a point in time until changes occur, but they can have huge effects on the organization. For instance, Congress recently passed an energy bill that outlaws incandescent light bulbs in 5 to 10 years. This will have a huge impact on the light bulb manufacturers that could not be anticipated by the organizations. Another example would be the impact of a requirement for ethanol to be 80 percent or more of auto gasoline. Two years ago, chicken farmers could not have forecast the shortage of corn for livestock feed, which results in price increases for milk and eggs. The particular indirect variables are known, but the exact impact is unknown. In some instances, organizations can impact the indirect variables. For example, the auto industry successfully lobbies against higher mileage requirements for sport utility vehicles and trucks, resulting in less severe changes than planned.

IT applications are designed to help a business decrease the costs of processes and manage crucial aspects of a business, which means that they should be used to support the most important variables, and help decrease the related costs. When analyzing case studies or a particular organization, students may not recognize the importance of focusing on the most significant variables. For instance, students were presented with a case study about Albertsons, a supermarket chain that invested heavily in technology creating customer self check-outs to eliminate cashiers, as well as handheld computers that could be used in conjunction with the creation of shopping lists online that would lead customers to those items in the store. Students didn't identify the need to focus the systems effort on inventory control and logistics, although these are the two largest costs and the most important variables in the grocery business.

In the supermarket business, eliminating a cashier who earns $10 an hour has very little impact on the overall efficiency of the business, and leading shoppers along a preset path minimizes impulse buying, which is a major source of revenue to the store. Students saw these systems efforts as great investments because of the innovative use of technology, not recognizing that these variables were not crucial to Albertsons's operations. This organization lost a great deal of money, and in 2006, it was bought out. The new management is focusing on the correct areas.

The organizational model described below is designed to make you sensitive to what areas can affect a business, as well as their importance to a business. The business strategy and the crucial variables identified in the model provide a guide to understanding the organization. Understanding an organization is necessary before any systems projects are commissioned, because that understanding ensures that the IT efforts are focused correctly to maximize the benefits to the organization.

Many variables affect organizations. An organization can control some variables, but not others. Before we can understand the many variables that affect a business, we must have some common terminology.

The following are the direct, controllable variables in the business environment that define a business model. Hold your mouse over each term to see its definition and examples of it.

business environment

competition

customers

employees

location

objective

owners

special organizational components

suppliers

The following are indirect, uncontrollable variables that help define the environment in which a business must function. Hold your mouse over each term to see its definition and examples of it.

government regulation

environmental factors

politics

laws

ethics

time

risk

The direct and indirect variables create the significant differences between business models.

There are three basic business models used today:

- the profit model
- the nonprofit model
- the government model

All of these models have the same basic elements: assets, employees, revenue, and expenses. However, their organization and the relative importance of the above variables in meeting business objectives have an unlimited number of variations. These variations in business models are far greater between industries than between companies within an industry.

These differences in business models are the determinants of the organizational structure, technical infrastructure, business systems, and computer systems needed to support their individual objectives. You must, therefore, know both the business model and the business strategy if you are to understand, develop, or modify a business's systems strategy.

A. Business Model

To better understand the business model concept, let's look at a well-known company: Walmart.

Because Walmart, Kmart, Target, Costco, Nordstrom, and Sears are part of the retail industry, their organization and business models are similar. Later, we will discuss how these very similar companies differ in their business strategies and, therefore, in their systems design and use.

1. Walmart

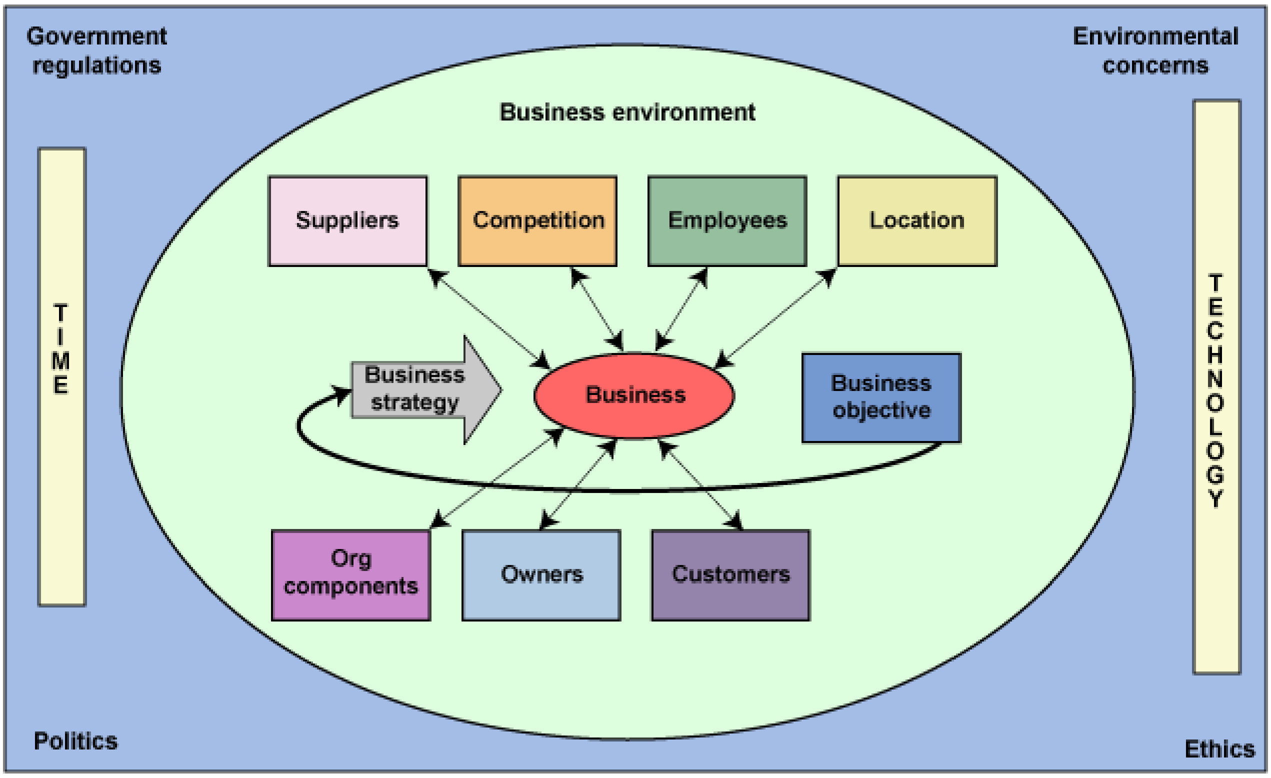
Walmart's business objective is to make a **profit** (the result of subtracting expenses from revenue) by selling many different items and services that it purchases from suppliers at the lowest possible price. An early Walmart mission statement was "To give ordinary folk the chance to buy the same thing as rich people" (Walmart, 2006a). It achieves this by having the lowest possible expenses. Walmart is a **publicly held company,** which means that it has issued stock (shares of the company or partial ownership) to finance the business; therefore, Walmart's owners are its stockholders, who are the beneficiaries of its profits.

Walmart's customers are the people who enter its stores or visit its website with the intent of purchasing merchandise or services that are located both within the United States and also in many foreign countries. The company has thousands of employees who perform many different jobs and may be members of a special organizational component, such as a subsidiary or even a fast-food or optical franchise. Walmart's many competitors, such as Target, Kmart, and Home Depot, influence its business strategy.

In addition to the controllable variables, Walmart must function successfully while all of the indirect, uncontrollable variables mentioned above are affecting it. Therefore, Walmart's business strategy must address these variables and monitor their ongoing impact on controllable variables so the company can make changes in its business strategy or address potential changes with its agencies before implementation.

Let us first look at a general business model, shown in figure 1.1, and then see how it would look for Walmart.

Figure 1.1
General Business Model



The above diagram shows all of the direct and indirect variables, the business strategy, and the business objective. You will note that the business strategy is an arrow driving the business toward its objective. The objective has an arrow going back to the business strategy, implying that the business objective can change because of forces acting on the business from the environment or indirect variables, which may necessitate a change in the business strategy.

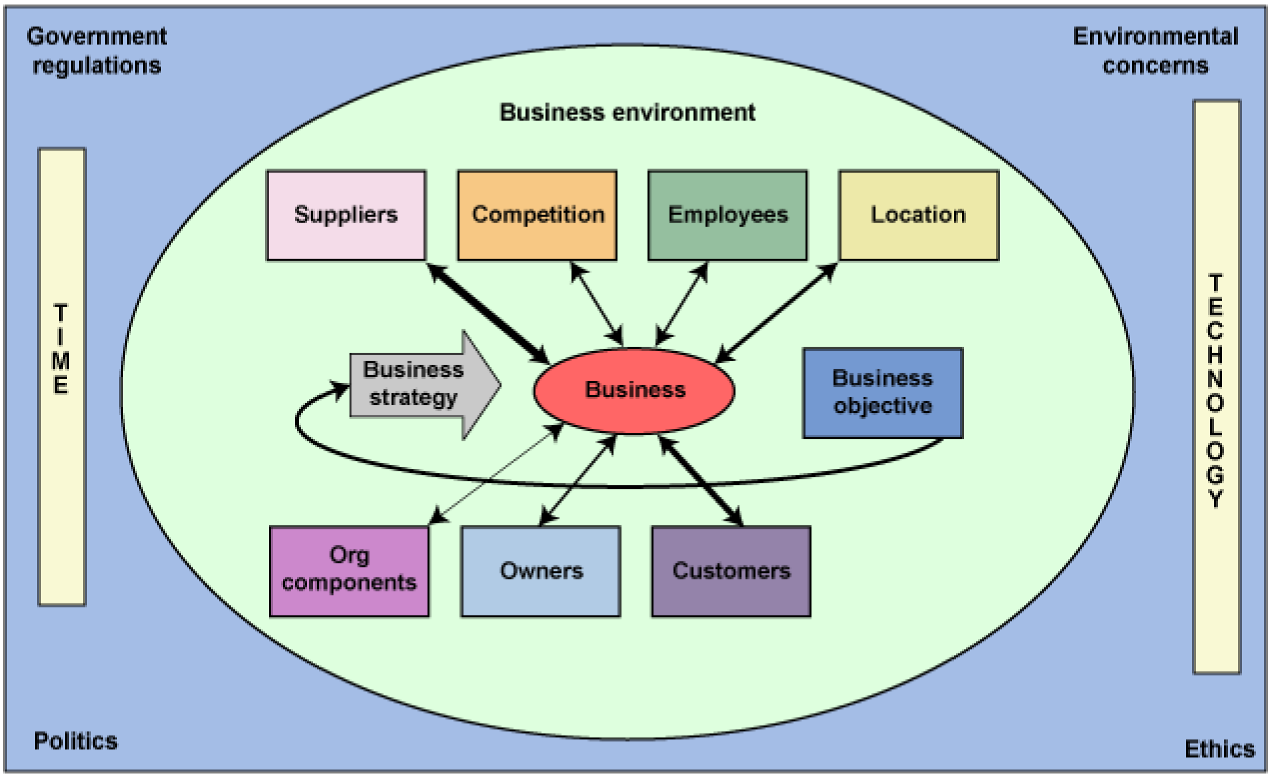
In the diagram, all of the direct variables are connected to the business by two-headed arrows, indicating that each variable affects the business and the business can affect the variables.

Ordinarily, the width of an arrow would indicate the degree to which the variable can affect the business or be affected by the business. Because there is a constant stream of feedback from business objectives (profitable operations) back to business strategy, these linkages may vary in width over time, based on the current degree of impact. Although the general model above shows all of the direct-variable arrows as being the same width, that is extremely unlikely in reality.

The blue area outside the business environment represents those factors that can influence the business but that the business cannot control—government regulations and environmental, political, and ethical concerns. It is safe to say that all businesses exist in this same area, regardless of their industry, and that these factors can affect them.

Let's look at the model for Walmart, as shown in figure 1.2, below.

Figure 1.2
Walmart Business Model



Walmart is in the retail industry, and its business is selling merchandise and services. It has many customers and suppliers, which are the major forces that affect its type of business. Although the cost of its merchandise depends far more on its suppliers and locations than on its employees, Walmart does have a great many employees. When Walmart's customers walk into one of its stores, they have an expectation that the retailer must meet, or the customer will have an unsatisfactory experience. Clearly, that expectation at Walmart is low prices; customers at other retailers may have different expectations. For example, at an upscale store, customers may expect exceptional quality and customer service in exchange for paying premium prices.

The supplier arrow is the widest of all of the arrows, which means that Walmart's suppliers have the biggest effect on its business and therefore should be of greatest concern to the company. Moreover, because Walmart recognizes this influence, the company negotiates with its suppliers for the best prices and product delivery based on expected sales. The competition arrow is quite narrow, indicating that although there are competitors, they are not a serious concern at this time.

Although employees account for a portion of Walmart's operating expenses, they are an insignificant expense when compared with the impact of suppliers. As the largest private-sector employer in the United States, employee-information maintenance and payroll are significant activities. Because Walmart has thousands of locations in the United States and around the world, it must adhere to many national payroll requirements that add complexity and affect its business. Based on the company's financial structure, however, employees have less impact on its total expenses than other areas do.

Walmart's owners are stockholders, but because they lack organization and strength, their impact is not as great as that of other players in the Walmart model. The stockholders' strength is minimized because the stock is widely distributed, not concentrated. If individual investors have problems with the company's management, they can do little but sell their stock. As a public corporation, however, Walmart does have the responsibility of making regular reports, not only to their stockholders but also to the Securities and Exchange Commission.

Most of the company's organizational components are the stores and the regions in which the stores are located. Although there are some franchises involved in food concessions and optical services in the stores, Walmart has no network of distributors or specialty stores with which to contend.

The time in which Walmart exists is favorable for its business because the dispersion of people and their mobility allow the company to have a large customer base over a significant geographic area. Its strategy of providing "everyday low prices" makes its customers feel that traveling to a Walmart store to capture savings is a wise decision.

Technology affects Walmart's business in two main ways, both of which help it support its business strategy. The first is simply that technological innovation in the areas of the merchandise it sells helps to keep customers coming to the stores, increasing sales. "Things are changing so fast with some stuff that obsolescence happens in six months …" (Carroll, 2007). For example, the latest iPod or video game provides new merchandise opportunities regularly. Second, the improvement of systems and technology that support logistics helps Walmart lower its costs. The Internet enables it to enlarge its customer base and assists with sales growth, even in locations in which Walmart has no stores.

Politics affects the Walmart business model, as we can see in Maryland when politicians try to pass a law that would apply only to Walmart, requiring the company to either maintain a certain level of medical insurance for all of its employees or pay the state for employee medical coverage. Ethics and politics may be interacting when we hear that child labor in underdeveloped countries manufactures the products it sells. The ethical treatment of employees is also an issue for Walmart, not necessarily because of how it treats its people, but because of its size and visibility.

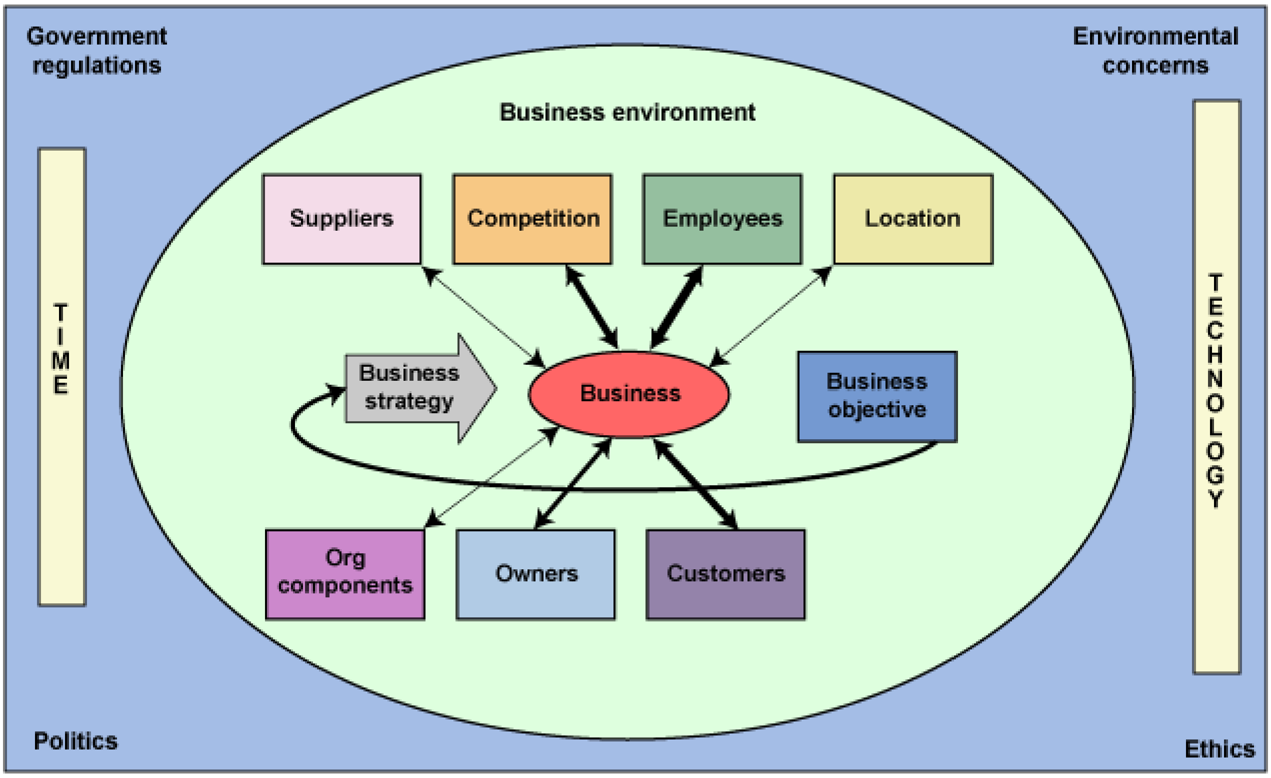
As a retailer, Walmart's concerns with environmental issues are relatively insignificant and are limited mostly to energy usage and recycling, as opposed to a manufacturing company, for which these issues would be much more important. Walmart's website does indicate a corporate goal of "doubling the fuel efficiency of our trucks, becoming 100% supplied by renewable energy, and creating zero waste in our stores" (Walmart, 2006a).

2. Booz Allen Hamilton

Now let's look at a consulting firm that is part of the service industry, Booz Allen Hamilton (BAH).

The model for BAH, shown below in figure 1.3, looks a bit different from that of Walmart or the retail industry. BAH is a major professional-services firm whose objective is to make a profit by studying business problems for customers and offering recommendations and solutions.

Figure 1.3
Booz Allen Hamilton Business Model



According to its website, "Booz Allen Hamilton, a global strategy and technology consulting firm, works with clients to deliver results that endure" (Booz Allen Hamilton, 2010). Its business strategy is designed to move its business in the direction of providing extraordinary recommendations to its customers by staying abreast of new business concepts and technology or developing new business concepts of its own. Therefore, both Walmart and BAH have objectives and strategies to achieve their objectives, which are very different and will constantly change over time because of changes in direct and indirect variables.

The most noticeable aspect of the BAH model is that the arrows to suppliers and locations are much thinner than those in the Walmart model. This is because BAH has no significant supply-chain considerations. Also, the number of locations is smaller and less critical to BAH's operations because its customers and employees are far more mobile than those of a retail store. BAH does have suppliers that can affect its costs—mainly travel companies, such as airlines, car rental agencies, and hotel chains—but these are far less significant than suppliers to the retail industry because travel expenses are typically charged to customers. BAH's other suppliers provide office equipment and supplies, computers, and other assorted commodities needed to support its activities, but again, these are far less crucial than suppliers to the retail or manufacturing industries.

BAH selects locations in the major centers of business and commerce around the world to make its services available to major customers—for-profit, nonprofit, and government. The actual staff members who will work in a particular engagement will move to the work site, either as needed for general support or because they possess special knowledge or skills.

You will note that the thickest arrow in the BAH model, representing the factor with the greatest impact, represents employees. BAH sells the knowledge and experience that their employees bring to the consulting engagement. Quality of staff is what BAH uses to differentiate itself from its competitors. To maintain the quality of the staff, it must provide training and development to its consultants. Because consultants are crucial to BAH's business strategy, it must do what it can to retain them, using pay, bonuses, and other benefits, both tangible and intangible.

The owner arrow is thicker than that in the Walmart model because consulting businesses like BAH are typically partnerships, and as such, a limited number of owners are intimately involved in the business. In 2008, the partnership sold a majority of the firm to The Carlyle Group, which maintained the closely held ownership of the firm. The partners can have an enormous impact on the objectives and strategies—much more so than thousands of stockholders would. In June 2010, BAH went public with a limited portion of the company, and The Carlyle Group maintained its majority ownership of the firm. The ownership arrow is wider than Walmart's, but not as wide as that of a true partnership.

In a true partnership, the partners benefit directly from the company's profits as they define profit sharing among themselves and the bonuses and salaries paid to their employees. The fact that the company is organized as a partnership is also significant because the major driver for exceptional employee performance is the potential for becoming a partner, with all of the associated benefits. The partnership also serves as a discriminator of those who do not measure up to the firm's expectations. BAH has some of these characteristics, but they are diluted because of the decreased power of the partners. However, because the owners are limited, their impact is greater than that of the owners of Walmart.

The competition arrow is wider than that in the Walmart model because there is no significant barrier to entry into the consulting business and competition is intense for customers, work, and employees. Employees who have established a relationship with a company are often attracted away by competitors and take their customers with them, and this can affect the relative market shares and profitability of the businesses. Employees also can be attracted away by companies for which they have consulted because of the knowledge, experience, and performance they demonstrated during their consulting engagements.

Customers are vital to consulting businesses because the potential market is smaller than for most businesses. Long-term relationships and outstanding customer service ensure a steady income stream for consultants, and good recommendations from their customers are essential if they are to acquire new customers. Because most of their customers are networked to other businesses, information about their performance—good or bad—spreads widely and rapidly to potential customers and can either positively or negatively affect future business. In contrast, there are many customers making small purchases in the retail business, where the impact of any one customer means far less in terms of future business.

Ethics is paramount in the consulting business because consultants become intimately familiar with the secrets, strengths, and weaknesses of the companies in which they may work during a consulting engagement. There is tremendous potential for unethical behavior by BAH or its employees, because such information would be extremely valuable to their clients' competitors. Other aspects of ethics to which consulting firms must be sensitive include telling the truth even when it is not what a client's management wants to hear, reporting hours accurately for billing purposes, providing consultants who are capable of doing the job and not merely for training purposes, and identifying only those problems that actually exist rather than inventing ones that could provide future business opportunities.

Overall, government regulation of the service industry is insignificant; however, regulation has had a significant impact on the consulting business in recent years. When an accounting firm that also provided consulting services was the auditor for a company, there was a recognized potential conflict of interest. This caused a number of accounting firms to sell off the consulting arms of their practices. Politics can have a great impact on consulting businesses because governments use a vast number of them, and politicians can greatly influence the selection of firms. Government regulations and environmental concerns also can have a large impact on BAH's clients, so BAH must be current on those regulations, which are typically promulgated by government agencies. This situation gives BAH an opportunity to increase its business as companies seek its expertise to help meet the requirements of these changing indirect variables.

3. Case Study: Mitigation Technologies

We will now introduce a real company that we will discuss throughout these modules. The company is Mitigation Technologies (MitiTech), a Maryland company that is privately held, meaning that it does not trade on any stock exchange and its transactions are therefore not in the public domain. MitiTech personnel were kind enough to meet with the authors of this course so that we could gain an understanding of their company. We will use their story to enhance your learning experience by demonstrating how the concepts taught are actually used in a successful business near UMUC Adelphi.

You may think that the information systems solutions we will present are feasible and applicable only to large corporations with extensive financial and IT resources. However, MitiTech is an example of a very small company that successfully produces, markets, and sells a state-of-the-art product that taps into a unique market niche. MitiTech uses its IT system to price its product and feed its supply chain, enabling the company to run a very lean, cost-effective organization.

MitiTech is synonymous with one of its products, Safetydrape, "which is a patented drapery system designed to mitigate flying glass shards and debris caused by a bomb blast" (Mitigation Technologies, 2003b).

Feel free to go to MitiTech's website and learn about the product and the company. We will summarize MitiTech's business operations for you, and then you will have the opportunity to determine what its business model looks like and answer some questions that will help highlight important aspects of its business and their relation to the model.

You can also read about the history of Safetydrape.

B. Use of Information Systems

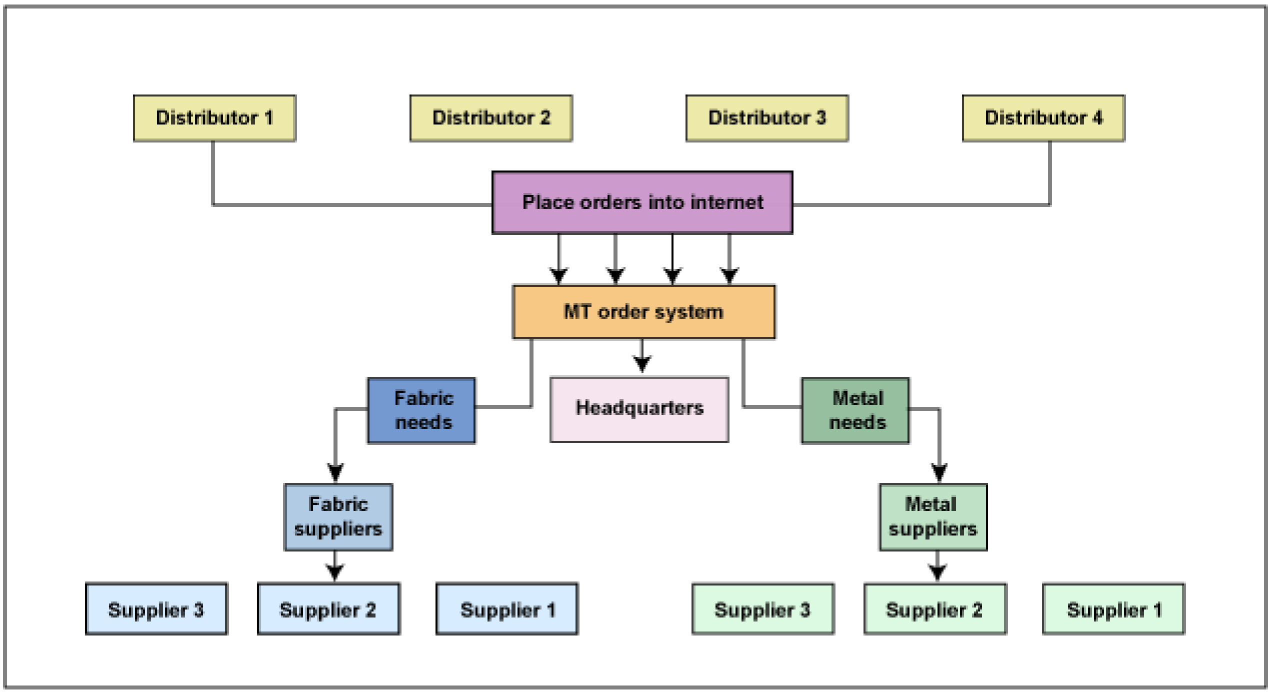
Before MitiTech existed, Skyline Mills, as a GSA contractor for regular draperies, was required by GSA rules always to price their products within the terms of their GSA agreement. Failure to comply with GSA pricing would have had serious repercussions for Skyline Mills. Because the GSA's drapery requirements had wide variations because of window sizes and installation configurations, Skyline Mills had to develop a system that would permit proper pricing in accordance with the GSA catalog by anyone, every time.

The company designed software that would convert drapery requirements into actual specifications, automatically pricing each order's requirements correctly. Because the initial demand for Safetydrape was small, the company developed a pricing application for it that was similar to the one they used for regular draperies. The company distributed the computer application to its representatives and customers on a CD. The programs on the CD functioned very well because pricing was fairly stable and the demand was predictable and well-understood. When pricing changed, however, the company had to create new CDs. Replacing all of the CDs in the field created a problem because the CDs could be passed around and their current location was often unknown. With no assurance that obsolete CDs were not being used, there was a potential for confusion and dissatisfaction because of conflicting pricing.

After September 11, 2001, management recognized that the demand for Safetydrape would increase dramatically and that they would need a new, refined process to support the company's future business requirements. MitiTech's business strategy was to build a sales and distribution network.

The sales and distribution process model is shown in figure 1.4.

Figure 1.4
MitiTech Distribution Process Model



MitiTech decided to minimize the number of employees, secure orders through dealers and distributors, and outsource the manufacture of components. With the potential increase in demand by both GSA users and customers outside the United States—governments all over the world—flexibility was crucial to the company's ability to meet demand as well as to pricing. This business situation rendered the use of estimating CDs obsolete.

To achieve the necessary flexibility, customers had to place orders, with the proper specifications, directly with suppliers. Headquarters had to be aware of both the sales and the requirements given to the suppliers so they could make decisions that would ensure that they could meet customers' needs promptly. To make their operation fast and efficient, management could adjust the sourcing among qualified suppliers and make decisions regarding shipping and installation requirements.

MitiTech did extensive work to ensure that it selected only quality suppliers to be part of its supply chain. It selected suppliers based on their ability to meet MitiTech's high quality requirements and their ability to meet the tight schedules customers demanded, but these suppliers were not exclusively committed to MitiTech. MitiTech's system had to (1) permit switching from one supplier to the next based on the suppliers' ability to perform at the time of the order, and (2) accommodate any new suppliers added in the future.

To enable this process, a new, web-based system replaced the old CD application. The new system permitted rapid price changes because they could be done in real time, for non-GSA customers, rather than requiring the creation and distribution of the older CD technology. The new system ensured that there were no outdated CDs in use that would create confusion and affect customer relations. It also enabled communication of the orders directly to the suppliers, and allowed MT's management to monitor orders and supplier performance.

Based on the standards developed by the Department of Homeland Security (DHS), Safetydrape was certified for protection from flying glass caused by explosions. Once this certification has been granted, neither the company selling the product nor the company using the product can be held liable for casualties resulting from flying glass caused by an explosion. Further, DHS is concerned about the safety of the country's critical infrastructure, refineries, power plants, and chemical plants, to name a few. To help secure these facilities, DHS can provide grants matching up to 50 percent of the cost to companies that install DHS-approved items.

Safetydrape products are manufactured at an ISO 9001:2000-registered quality management system (QMS) plant. The International Organization for Standardization (ISO) is a global network that has identified a series of international quality standards for businesses, governments, and society. "ISO 9001:2000 specifies requirements for a quality management system for any organization that needs to demonstrate its ability to consistently provide product that meets customer and applicable regulatory requirements and aims to enhance customer satisfaction" (International Organization of Standardization, n.d.). Organizations that plan to market their products internationally are required to obtain ISO certification.