Setting the Stage

Every company, regardless of its size and activities, is touched in some way by technology. For example, the use of computer hardware and software has now become commonplace for recording the terms of business transactions and creating and maintaining business records and even the smallest firms need to be attentive to improvements in computing tools that can lead to lower costs and greater efficiencies. Technology becomes even more important for the firm as its activities expand to include product development and manufacturing and it looks to stake out a technology-based competitive advantage. Given the importance of technology in so many of the activities engaged in by their companies, the founders and other members of the executive team need to understand the science and practice of technology management and the steps that should be taken to develop and implement the company’s technology strategy, conduct technology assessments and audits, create an effective management structure for technology, develop and implement plans for acquiring necessary technologies and perfect and protect the company’s legal rights to use its intellectual property.

Key Topics Covered

Key topics covered in this chapter include the following:

- The scope and practice of technology management
- The competitive advantages of technology and technology strategies
- Conducting technology assessments and audits
- Determining management responsibility for technology activities
- Technology acquisition and protection strategies
- Strategies for exploiting technology rights
- Knowledge management processes

Learning Objectives

After reading this chapter, you should be able to:

1. Understand and identify the potential competitive advantages of technology to the company.
2. Describe the role that technology can play in a company’s overall business strategy.
3. Describe the key issues relating to technology management.
4. Describe the roles and responsibilities of the company’s chief technology officer.
5. Understand the purposes of technology assessments and audits and the steps required for completion.
6. Understand the strategies that companies can use to develop new technologies and acquire the rights to use existing technologies.
7. Understand the methods that can be used to protect the advantages of technologies.
8. Understand the strategies that can be used to exploit the advantages of technologies.

§1 Introduction
Every company, regardless of its size and activities, is touched in some way by technology. For example, the use of computer hardware and software has now become commonplace for recording the terms of business transactions and creating and maintaining business records and even the smallest firms need to be attentive to improvements in computing tools that can lead to lower costs and greater efficiencies. Technology becomes even more important for the firm as its activities expand to include product development and manufacturing and it looks to stake out a technology-based competitive advantage. Given the importance of technology in so many of the activities engaged in by their companies, the founders and other members of the executive team need to understand the science and practice of technology management and the steps that should be taken to develop and implement the company’s technology strategy, conduct technology assessments and audits, create an effective management structure for technology, develop and implement plans for acquiring necessary technologies and perfect and protect the company’s legal rights to use its intellectual property.¹

§2 Scope and practice of technology management

In general, technology management concerns itself with the creation or acquisition of technology, particularly the process of transforming basic knowledge, or science, into products that have practical and commercial utility in the marketplace or in internal business activities. This process is also often referred to as “innovation” and has been the subject of analysis and commentary by a wide range of academics and business consultants, particularly as to those industries that are grounded in continuous advances in scientific knowledge. Technology management also includes the steps that need to be taken to protect the technology of the company, including development and maintenance of an intellectual property rights portfolio and formulation and implementation of strategies for commercial exploitation of the company’s technological assets.

Key issues relating to technology management include identification and evaluation of potentially valuable technologies, selection and implementation of strategies to access needed technologies, identification of markets for exploitation of new technologies, creation of the optimal organizational structure for management of new technologies, establishment of procedures for perfecting and maintaining intellectual property rights associated with new technologies and establishment of scanning and forecasting procedures to anticipate future trends in technology development and use. The wide scope of activities included under the umbrella of technology management, and the need to place technology squarely within the company’s overall strategic planning, means that it is important to designate one person, often a “chief technology officer”, who will be responsible for the advance of existing strategic technologies and identification of the future technology requirements of the company. This person will be responsible for a number of different activities including technology audits, benchmarking the company’s technology portfolio in relation to competitors, technology forecasting, defining the

¹ For detailed discussion of the science and practice of technology management, see “Technology Management: A Library of Resources for Sustainable Entrepreneurs” prepared and distributed by the Sustainable Entrepreneurship Project (www.seproject.org).
strategic technology requirements of the company, and establishing procedures and practices for keeping informed of new developments and acquiring and protecting those technologies that are crucial to the business strategies of the company.

§3 Competitive advantages of technology

Companies involved in technology-based industries and markets must understand the importance of approaching technology management as an essential element of the firm’s overall competitive strategy. This requires an appreciation of the potential competitive advantages offered by technology and the need to integrate technology into the analysis of the company’s competitive position. While the competitive advantage offered by technology will vary from among industries and markets, it is fair to say that companies have often leveraged technologies to reduce costs associated with production and distribution of products, increase efficiencies in production and distribution processes, support product differentiation strategies based on higher levels of quality and/or reliability, facilitate circumvention of barriers to entry and competition with established firms, trigger a radical change in the basis for competition in a specific industry and/or create new markets and industries through discovery of solutions to problems that are important to consumers.

An effort should also be made to evaluate the strength of the company’s core competencies in the technological areas that are most relevant to businesses that the company wishes to pursue and the products and services necessary for the company to be competitive in those business areas. Once the relationship of technology to the goals and strategies of the company is clearly understood senior management must develop the company’s technology strategy and establish procedures for implementing and monitoring that strategy. Of course, the value of any potential competitive advantages depends on a number of factors. For example, a differentiation strategy based on technology will only be successful if the company will be able to adequately protect the technology from imitation by competitors. Moreover, while technology allows a company to develop interesting product features the effort is only worth it if customers recognize the value and are willing to pay for it.

§4 Technology strategy

Effective technology management requires the development and implementation of a clear technology strategy that defines the role that technology is expected to play in the overall business strategy of the firm. The technology strategy will determine the focus of the company’s internal research and development activities, as well as the need to look to outside sources for technology, and also impacts the selection of market sectors for the company’s new products and the way those products are positioned in the eyes of potential customers.

Formulation and execution of technology strategy cannot occur in a vacuum and companies must act in a manner that is consistent with the external environment in which they are operating. The success of any technology strategy depends upon diffusion and
adoption of new technologies or innovations, both within companies and among their customers. A variety of factors influence diffusion and adoption including politics and governmental policies; societal culture; understanding of, and experience with, elements of information systems (i.e., people, hardware, software, communications networks and data resources); and economic, geographic and geopolitical factors, particularly income levels and characteristics of populations (i.e., skills, educational qualifications, literacy rates, productivity and the cost of labor).

There is no single method for defining and determining the technology strategy of a company or business unit. One possibility is to focus on the degree to which the company is dedicated to becoming a “technology leader,” as opposed to pursuing a “follower strategy.” A technology leadership strategy means that the company has elected to compete on the basis of technological innovation and high technical performance in its chosen market sectors. The emphasis on innovation means that the company is willing to invest heavily in expensive, high risk projects to become the first to develop and commercialize “leading edge” technologies and products based on those technologies. In contrast, a follower strategy is the preferred approach of firms that are uncomfortable with taking on the risk of technical and/or market failure that accompanies any effort to be a pioneer in a particular area. Followers come in a variety of forms and pursue several different core strategies based on exploitation of technology developed by the leader. For example, IBM was known as a firm prone to pursuing a “fast follower” strategy based on introducing follower products soon after the technology leader. IBM was able to compete effectively based on its marketing strengths, brand name and the ability to observe reaction to the “leader product” and make appropriate modifications and enhancements to that product.

At the earliest stages of their life cycle, technology-based growth companies have a limited universe of choices with respect to technologies and products and the decision between a leadership or follower strategy would, by definition, apply company-wide. As the firm grows, however, and expands into multiple markets and creates new divisions and business units, strategies must be established for each of these areas. As a practical matter, only the largest global businesses can reasonably follow a technology leadership policy on a company-wide basis and the more common approach is for maturing businesses to adopt a leadership strategy in some markets and follow in others. The challenge, of course, is achieving and maintaining the appropriate balance and making sure that adequate resources are available, and properly allocated, to successfully pursue the chosen strategy in each area.

Once the technology strategy for the company has been established, it is essential that senior management take the necessary steps to ensure that the strategy is effectively implemented and monitored. Some of the issues that will be of particular concern to members of the senior management team include making sure that budgetary and strategic planning processes focus on ensuring that sufficient resources are allocated to technology development, ensuring that departments and business units engage in collaborative activities with respect to technology development and that information is disseminated quickly and efficiently throughout the organizational structure, becoming
actively involved in technology-based strategic alliances and joint ventures with outside parties and establishing and following processes for closely monitoring progress toward technology-related goals and objectives against clear and objective benchmarks.

§5 Technology assessments and audits

As part of the administering the technology strategy for the entire company, senior management must also conduct regular assessments of the individual technology policies of each internal department or business unit. The goals for these reviews include evaluation of the performance of department or business unit managers with respect to technology development and collection of information to determine whether the activities of the various parts of the company are consistent with, and support, the overall technology policy established by senior management. Many of the questions posed during these assessments mirror concerns for the company as a whole. For example, the portfolio of technology development projects for each department or business unit should be reviewed to determine whether it is appropriately balanced and an effort should be made to calculate the net financial impact of the development activities. In addition, the evaluation should include the specific systems and procedures used to manage development projects. Special attention should also be paid to gauging the correlation between technology policy and business strategy. Among other things, this dictates inquiry into whether the development work is based on demonstrated market needs and whether past technology development projects have contributed to the growth of the firm. Technology-based activities should be reviewed against strategic benchmarks and progress made by other participants in the relevant markets and industries. Finally, legal review and compliance efforts should focus on creation of intellectual property assets, identification and perfection of ownership rights, procedures for maintaining legal usage rights and procedures for avoiding infringement of the legal claims or contractual rights of others. Analysis of the information collected during the audit process can be broken out into four areas: ownership, perfection and protection, infringement and assessment of competitive utility. Strategies for curing defects in ownership of technology include releases and assignments, licensing, reverse engineering and independent development.

§6 Management responsibility for technology activities

In their earliest stages of development companies generally adopt traditional organizational structures that follow a functional approach based on creation of separate groups or units to manage and perform key business activities. With respect to technology-based activities this means that various aspects of technology development and exploitation would be distributed among separate functional departments focusing primarily on research and development (“R&D”), product development and engineering. In addition, companies will form dedicated groups for other activities in the product value chain, including manufacturing, marketing and technical service and support and all of these functions would interact with so-called “corporate” functional activities such as finance, human resources and legal and regulatory affairs. While each functional group or unit would have a designated lead manager, such as an R&D director or chief engineer, the traditional structure vests senior management responsibility for a number of
key technology-based activities in a single office. This person, sometimes referred to as a “technical director” or a vice president of development, is responsible for management and oversight of all activities relating to R&D, product development and engineering.

Combining all of these activities under the control of a single manager is an attractive, and often necessary, choice for small companies in their early stages of development. In that situation, the firm lacks the financial resources to recruit and support a large layer of managers for each listed activity. Moreover, assuming the company is involved in no more than a handful of technology and product development initiatives at this stage, integrating all of these activities is a sensible approach since it is likely that employees from all areas will be working together closely and the firm has not reached the point where strict and formal departmental lines have been drawn. Resolving technology strategy issues that cross functional lines is generally not that difficult in the early days after the company is launched because those issues can be and usually are, discussed at regular meetings of senior management leaders from all areas of business, including the CEO, the technical director and directors from finance, operations, manufacturing and marketing. This group, still relatively small and closely involved with the modest number of initial product development efforts can easily share information that normally goes into decisions regarding technology strategy, including R&D priorities, requirements for new product development and manufacturing and engineering issues. These discussions will lead to basic decisions about technology strategy that will guide actions throughout the firm until operations become too complex to be supported by informal communications and lines of authority.

As the company grows, however, the role and value of the technical director position becomes more problematic. For example, the authority of the technical director begins to erode as the various areas assigned to position begin to expand and develop their own unique departmental cultures, which often results in resistance to efforts to coordinate activities with other departments even if they all report to the same senior manager. Perhaps more important, however, is the need to recognize the overriding importance of technology issues to the company and this typically leads to the conclusion that it is best to create a senior management position designated as the “chief technology officer”, or “CTO”, that is placed on the same level as the CEO, the CFO and chief operating officer. The activities and responsibilities of the CTO will vary depending on the size and business focus of the company and the skills, experience and job descriptions of the other members of the senior management group. That said, however, a strong CTO will generally be actively involved in development and implementation of technology strategies of company and individual business units; planning and coordination of R&D activities; overseeing activities of the technology managers for each of the company’s business units; overseeing technology sales, purchase and licensing activities; advising senior management on technology-related issues; and supporting new technology-based business initiatives.

§7 Technology acquisition strategies
Once the company has selected those technology prospects that appear to be most promising in light of the firm’s specific business goals and risk tolerance, a decision needs to be made regarding the best way for the company to develop or otherwise acquire the specific technologies. Obviously, the company may elect to develop the technology on its own using internal resources. This strategy means that the company must bear the entire cost and risk of the development effort; however, the company does gain maximum flexibility and will ultimately be able to harvest all of the benefits if the work is successful. It is unrealistic, however, for any company, regardless of its size and the scope of its resources, to believe that it can successfully and efficiently fulfill all its technology requirements through internal R&D. The cost of acquiring and maintaining the necessary human and tangible assets would be prohibitive and even if the assets were available the company cannot expect to be able to shift it technology strategy quickly enough to keep up with technology specialists firms dedicated to leading-edge R&D in a particular area. Accordingly, as the company establishes its priorities with respect to R&D, consideration must constantly be given to the feasibility of outsourcing all or a portion of the required work.

There are several common methods that may be used for acquiring new technologies from outside parties, including contract R&D arrangements, purchasing and licensing arrangements, joint development arrangements, joint ventures and strategic alliances and acquisitions. Other non-transactional methods for tapping into external sources for new technologies including hiring individuals and/or teams of specialists; purchasing products, materials or equipment in which the desired technology is imbedded, although care should be taken not to unwittingly copy the technology in a manner that infringes the rights of others; bargaining with suppliers for them to invest in the development of technologies that can improve the cost or effectiveness of parts delivered to the company; obtaining external funding for new R&D projects through limited partnerships and similar investment vehicles; and increased investment of time and financial resources in “technical intelligence” activities, including attendance at research conferences and ongoing scanning of publications.

§8 Protecting the advantages of technologies

Investment in the development or other acquisition of key technologies is only warranted if the company will be able to appropriate and protect the advantages of such technologies. The most commonly used methods for appropriating the gains from innovation include reliance on statutory intellectual property rights and non-statutory protection of trade secrets, complimentary assets, multiple technologies and lead time. Companies may rely on one strategy or, as is more typical, may attempt to use a combination of two or more methods at a given point in the development and deployment of an emerging technology. 

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2 For further discussion of the methods for appropriating the gains from innovation, see “Protecting Intellectual Property” in “Entrepreneurship: A Library of Resources for Sustainable Entrepreneurs” prepared and distributed by the Sustainable Entrepreneurship Project (www.seproject.org).

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Statutory intellectual property rights include patents, copyrights and trademarks. Companies often consider building a patent portfolio to protect the fruits of their innovative activities; however, consideration must be given to the costs of obtaining a patent, the consequences of public disclosure of the invention in the patent application and the real possibility that attempt to procure a patent will be foiled by competitors willing to embark on long and costly litigation. Trade secrets are not statutory rights; however, trade secret protection is a viable option that is discussed in detail in another program in this series. Still another method that is often used for appropriating the advantages of emerging technologies is investment in the means necessary to achieve control over complimentary assets that are required to effectively deploy the technology in specified markets. Complimentary assets might include control of distribution channels; service and support; existing relationships with key business partners, including supplier and customers; and/or control over complimentary products and services. Control over complimentary assets can neutralize, if not eliminate, shortcomings that in the other strategies available for protection of innovation.

Companies may be able to protect their technological position, and eliminate or substantially reduce the risk of imitation by competitors, by integrating multiple technologies into their products. Since small firms generally lack the resources to develop two or more core technologies on their own, complementary technologies are usually obtained from outside sources through acquisition or, more likely, licensing given the prohibitive costs of outright acquisition. While this strategy can be effective, the company must recruit technical specialists that are qualified to understand and integrate the disparate technologies. Finally, in addition to, or in lieu of, protection under patent and trade secret laws, companies sometimes rely on “lead time” to secure the initial advantages that may be associated with mastery of an emerging technology. Lead time includes “first mover” advantages as well as the ability of the leader to move forward quickly with assimilating knowledge. Lead time advantages are greater when the product is durable or the company is able to establish a good reputation and make it more difficult for initial customers to “switch” to other alternatives. Lead time can also be an opportunity to acquire control over the complimentary assets that are necessary in order to realize the benefits from the technology.

§9 Exploitation strategies

Once the technologies have been selected, acquired and protected, the company must determine the best way to actually exploit the technology and the products and processes derived from the technology. While this stage is discussed separately, it actually overlaps significantly with the selection decisions since it makes little sense for the company to pursue a particular technology unless and until it has a fairly good idea of how it will actually be used in the company’s future business strategies and activities.

Examples of situations where the company may opt for external exploitation of a new technology include the following:
- Reliance on outside licensees may be more attractive when the company has achieved a strong proprietary position with respect to the technology through patents and copyrights, since it becomes more difficult for the licensees to be able “appropriate” the technology for their independent use.

- A relationship with a local partner may be preferable, or even required, when necessary in order to successfully introduce a new technology or product into a new foreign market. Local partners can provide competence with respect to regulatory compliance, overcoming trade barriers and dealing with the unique characteristics of local distribution channels.

- An aggressive licensing campaign can be used to influence industry standards with respect to the preferred technological platforms. For example, a firm may license its new technology to leading firms in various industries with an eye toward become their leading technology vendor in the future.

- Licensing is often the best and quickest means for gaining access to the complimentary assets that must be deployed in order successfully commercialize the technology. Many small firms must look to outside manufacturers and distributors to launch their first products since these firms lack the capital to manufacture the products in bulk and develop a sizable internal sales force.

Technology assets can also be used as a form of “business currency” to gain access to the technology assets of other companies. For example, companies with distribution strengths in different markets may enter into an arrangement that allows each party to sell the technology-based products of the other in those markets in which they are best suited. Also, technology may be licensed to another party with the understanding that the company would have the right to use and exploit any improvements or enhancements that might be developed by the licensee. In addition, companies that have patents covering core technologies in a particular market can attempt to use licensing strategies to restrict the activities of their licensees. For example, a licensee may be prohibited from engaging certain research activities that might lead to technologies that would reduce the value of the licensed patents. However, these types of restrictions must be imposed with great care in light of antitrust and competition laws that generally disfavor such agreements. Finally, technology-based alliances can be formed to facilitate the transfer of a technology that is already in existence or may be used as a cost-effective way to develop new technologies. In many cases, development work will be followed by further collaboration with respect to the actual commercialization of the technology created during the initial phase.

§10 Knowledge management

The scope of technology management has expanded to include formal management of the company’s “knowledge”, which has been defined as “the integration of information, ideas, experience, intuition, skill and lessons learned that creates added value for a firm” and divided into two categories: “explicit knowledge”, described as being “easily identifiable, easy to articulate, capture and share – it is the stuff of books, manuals and reports”, and “tacit knowledge”, described as consisting “predominantly of intuition,
feelings, perceptions and beliefs, often difficult to express and therefore difficult to capture and transfer. The term “knowledge management” refers to the processes and techniques used by an organization to create, acquire, transfer and protect the information and knowledge necessary for the organization to be successful, and also includes the steps that must be taken to identify improvements to the existing knowledge base that must be pursued in order to respond to competitive challenges and changes in the operating environment. Knowledge management should also focus on strategies for effectively integrating proprietary knowledge into the company's key business methods and practices, including new product development and manufacturing. The goal is to deploy the technology in a way that materially improves the performance of those processes. For example, effective technology management can increase the productivity and speed of product development projects and permit the company to quickly and easily make last-second changes in the product to incorporate advances in technology and changing needs in the marketplace.

Effective knowledge management involves several different steps and strategies. First, the organization must conduct what is essentially a diagnostic audit of its knowledge base, including a determination of the knowledge requirements of the organization, a review and evaluation of the current state of the organizations' knowledge, and the identification of any gaps in the knowledge base that must be filled. Next, the company must develop clear and proactive strategies for knowledge acquisition. In many cases, knowledge will be pursued through personal experiences of company employees through their research projects and internal communications. Alternatively, knowledge can be acquired through a wide range of interactions with outside sources, ranging from literature review to a full-blown technology transfer arrangement with an outside party.

Once the knowledge has been created or otherwise acquired, the company must institutionalize the knowledge and make sure that it is disseminated throughout the company and put into practice as part of the company's business procedures. The most effective methods in this area involve face-to-face communications. For example, the company might arrange for regular meetings of peer employees at which each of the participants is asked to share information and the entire group discusses methods for applying the information in like situations that they all confront during the course of their activities. Companies may also share information through formal classes and training sessions or through regular or special broadcasts on the internal Intranet. In cases where the knowledge is acquired from an outside party, perhaps through a license arrangement, company personnel should be allowed to work with representatives of the licensor that might be involved in the technology transfer process.

### Summing Up

1. While the competitive advantage offered by technology will vary from among industries and markets, it is fair to say that companies have often leveraged technologies to reduce costs associated with

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production and distribution of products, increase efficiencies in production and distribution processes, support product differentiation strategies based on higher levels of quality and/or reliability, facilitate circumvention of barriers to entry and competition with established firms, trigger a radical change in the basis for competition in a specific industry and/or create new markets and industries through discovery of solutions to problems that are important to consumers.

2. Effective technology management requires the development and implementation of a clear technology strategy that defines the role that technology is expected to play in the overall business strategy of the firm. The technology strategy will determine the focus of the company’s internal research and development activities, as well as the need to look to outside sources for technology, and also impacts the selection of market sectors for the company’s new products and the way those products are positioned in the eyes of potential customers. There is no single method for defining and determining the technology strategy of a company or business unit; however, one possibility is to focus on the degree to which the company is dedicated to becoming a “technology leader,” as opposed to pursuing a “follower strategy”, and the balance that should be struck between these two extremes across the company’s technology portfolio. Selection of a technology strategy requires consideration of the likely rate of diffusion and adoption of new technologies or innovations, both within companies and among their customers. A variety of factors influence diffusion and adoption including politics and governmental policies; societal culture; understanding of, and experience with, elements of information systems (i.e., people, hardware, software, communications networks and data resources); and economic, geographic and geopolitical factors, particularly income levels and characteristics of populations (i.e., skills, educational qualifications, literacy rates, productivity and the cost of labor).

3. Key issues relating to technology management include identification and evaluation of potentially valuable technologies, selection and implementation of strategies to access needed technologies, identification of markets for exploitation of new technologies, creation of the optimal organizational structure for management of new technologies, establishment of procedures for perfecting and maintaining intellectual property rights associated with new technologies and establishment of scanning and forecasting procedures to anticipate future trends in technology development and use.

4. Companies should designate one person, often a “chief technology officer”, who will be responsible for the advance of existing strategic technologies and identification of the future technology requirements of the company and who will be responsible for a number of different activities including technology audits, benchmarking the company’s technology portfolio in relation to competitors, technology forecasting, defining the strategic technology requirements of the company, and establishing procedures and practices for keeping informed of new developments and acquiring and protecting those technologies that are crucial to the business strategies of the company.

5. As part of the administering the technology strategy for the entire company, senior management must also conduct regular assessments of the individual technology policies and practices of each internal department or business unit. Technology-based activities should be reviewed against strategic benchmarks and progress made by other participants in the relevant markets and industries. In addition, legal review and compliance efforts should focus on creation of intellectual property assets, identification and perfection of ownership rights, procedures for maintaining legal usage rights and procedures for avoiding infringement of the legal claims or contractual rights of others.

6. Companies may elect to develop desired technologies using internal resources; however, in most instances companies lack the capital and resources to do all of the work on their own even if success would give them maximum flexibility and allow them to harvest all of the benefits of the work. The reality is that as companies establish priorities with respect to research and development, they typically rely on one or more methods for acquiring new technologies from outside parties, including contract R&D arrangements, purchasing and licensing arrangements, joint development arrangements, joint ventures and strategic alliances and acquisitions.

7. Investment in the development or other acquisition of key technologies is only warranted if the
company will be able to appropriate and protect the advantages of such technologies. The most commonly used methods for appropriating the gains from innovation include reliance on statutory intellectual property rights and non-statutory protection of trade secrets, complimentary assets, multiple technologies and lead time.

8. Companies may use their proprietary rights with respect to valuable technologies in licensing arrangements to gain access to the technology assets and other unique skills and resources of other companies. Technology rights can also be used as contributions to new business ventures and can serve as barriers to technology strategies of competitors. In addition, the value of technologies can be enhanced through “knowledge management”, which include the processes and techniques used by an organization to create, acquire, transfer and protect the information and knowledge necessary for the organization to be successful, and the steps that must be taken to identify improvements to the existing knowledge base that must be pursued in order to respond to competitive challenges and changes in the operating environment.
About the Author

This chapter was written by Alan S. Gutterman, whose prolific output of practical guidance and tools for legal and financial professionals, managers, entrepreneurs and investors has made him one of the best-selling individual authors in the global legal publishing marketplace. His cornerstone work, *Business Transactions Solution*, is an online-only product available and featured on Thomson Reuters’ Westlaw, the world’s largest legal content platform, which includes almost 200 book-length modules covering the entire lifecycle of a business. Alan has also authored or edited over 80 books on sustainable entrepreneurship, leadership and management, business law and transactions, international law and business and technology management for a number of publishers including Thomson Reuters, Practical Law, Kluwer, Aspatore, Oxford, Quorum, ABA Press, Aspen, Sweet & Maxwell, Euromoney, Business Expert Press, Harvard Business Publishing, CCH and BNA. Alan has extensive experience as a partner and senior counsel with internationally recognized law firms counseling small and large business enterprises in the areas of general corporate and securities matters, venture capital, mergers and acquisitions, international law and transactions, strategic business alliances, technology transfers and intellectual property, and has also held senior management positions with several technology-based businesses including service as the chief legal officer of a leading international distributor of IT products headquartered in Silicon Valley and as the chief operating officer of an emerging broadband media company. He has been an adjunct faculty member at several colleges and universities, including Berkeley Law, Golden Gate University, Hastings College of Law, Santa Clara University and the University of San Francisco, teaching classes on corporate finance, venture capital, corporate governance, Japanese business law and law and economic development. He has also launched and oversees projects relating to sustainable entrepreneurship and ageism. He received his A.B., M.B.A., and J.D. from the University of California at Berkeley, a D.B.A. from Golden Gate University, and a Ph. D. from the University of Cambridge. For more information about Alan and his activities, please contact him directly at alangutterman@gmail.com, follow him on LinkedIn (https://www.linkedin.com/in/alangutterman/) and visit his website at alangutterman.com.

About the Project

The Sustainable Entrepreneurship Project (www.seproject.org) was launched by Alan Gutterman to teach and support individuals and companies, both startups and mature firms, seeking to create and build sustainable businesses based on purpose, innovation, shared value and respect for people and planet. The Project is a California nonprofit public benefit corporation with tax exempt status under section 501(c)(3) of the Internal Revenue Code dedicated to furthering and promoting sustainable entrepreneurship through education and awareness and supporting entrepreneurs in their efforts to launch and scale innovative sustainable enterprises that will have a material positive environmental or social impact on society as a whole.

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