PART 1

Venture Opportunity, Concept, and Strategy

Entrepreneurs have important roles in creating new businesses that fuel progress in societies worldwide. The entrepreneur uses innovation and technology to foster positive impact and activity in all facets of life. The capable entrepreneur learns to identify, select, describe, and communicate the essence of an opportunity that has attractive potential to become a successful venture. The entrepreneur is able to describe the valuable contributions of a venture and create the design of a business model that can be sustained by a competitive advantage. The venture team creates a road map (strategy) that can, with good chance, effectively lead to the commercialization of the new product or service in the marketplace with a sustainable competitive advantage. ■

CHAPTER 1

Economic Growth and the Technology Entrepreneur

There are risks and costs to a program of action. But they are far less than the long-range risks and costs of comfortable inaction.
John F. Kennedy

CHAPTER OUTLINE

What drives global entrepreneurship?

Entrepreneurs strive to make a difference in our world and to contribute to its betterment. They identify opportunities, mobilize resources, and relentlessly execute on their visions. In this chapter, we describe the characteristics of the people called entrepreneurs and the process they use to create new enterprises. We identify firms as key structures in the economy and the role of entrepreneurship as the engine of economic growth. New technologies form the basis of many important ventures where scientists and engineers combine their technical knowledge with sound business practices to foster innovation. ■

1.1 The Entrepreneur's Challenge

The needs and problems of the world's population are immense. From environmental sustainability to security, from organizational inefficiencies to corruption, from information overload to disease, from transportation to communication, the opportunities for people to create a positive impact are enormous. **Entrepreneurs** are people who identify and pursue solutions among problems, possibilities among needs, and opportunities among challenges.

Entrepreneurship is more than the creation of a business and the wealth associated with it. It is focused on the creation of a new enterprise that serves society and makes a positive change. Entrepreneurs can create great and reputable firms that exhibit performance, leadership, and longevity. In Table 1.1 look at the examples of successful entrepreneurs and the enterprises they created. What contributions have these people and organizations made? What organization would you add to the list? What organization do you wish you had created or been a part of during its formative years? What organization might you create in the future?

TABLE 1.1 Selected entrepreneurs and the enterprises they started.

Entrepreneur	Enterprise started	Age of entrepreneur at time of start	Year of start
Bezos, Jeff	Amazon.com (USA)	31	1995
Brin, Sergey	Google (USA)	27	1998
Dell, Michael	Dell Computer (USA)	19	1984
Gates, William	Microsoft (USA)	20	1976
Greene, Diane	VMWare (USA)	42	1998
Hewlett, William	Hewlett-Packard (USA)	27	1939
Ibrahim, Mo	Celtel (Africa)	42	1998
Lerner, Sandra	Cisco (USA)	29	1984
Li, Robin	Baidu (China)	32	2000
Ma, Jack	Alibaba.com (China)	35	1999
Plattner, Hasso	SAP (Germany)	28	1972
Rottenberg, Linda	Endeavor (Chile, Argentina)	28	1997
Sasaki, Koji	AdIn Research (Japan)	43	1986
Shwed, Gil	Check Point (Israel)	25	1993
Tanti, Tulsi	Suzlon Energy (India)	37	1995
Yunus, Muhammed	Grameen Bank (India)	36	1976
Zuckerberg, Mark	Facebook (USA)	20	2004

Entrepreneurs seek to achieve a certain goal by starting an organization that will address the needs of society and the marketplace. They are prepared to respond to a challenge to overcome obstacles and build a business. As Martin Luther King, Jr. (1963), said, "The ultimate measure of a man is not where he stands in moments of comfort and convenience, but where he stands at times of challenge and controversy."

For an entrepreneur, a **challenge** is a call to respond to a difficult task and the commitment to undertake the required enterprise. Richard Branson, the creator of Virgin Group, reported [Garrett, 1992]: "Ever since I was a teenager, if something was a challenge, I did it and learned it. That's what interests me about life—setting myself tests and trying to prove that I can do it."

Entrepreneurs are resilient people who pounce on challenging problems, determined to find a solution. They combine important capabilities and skills with interests, passions, and commitment. Over nearly a decade, Fred Smith worked on perfecting a solution to what he viewed as a growing problem of organizations to find ways to rapidly ship products to customers. To address this challenge, Smith saw an opportunity to build a freight-only airline that would fly packages to a huge airport and then sort, transfer, and fly them to their destinations overnight. He turned in his paper describing this plan to his Yale University professor, who gave it an average grade, said to be a C. After he graduated, Smith served four years as a U.S. Marine Corps officer and pilot. Following his military service, he spent a few years in the aviation industry building up his experience and knowledge of the industry. Then, he prepared a fully developed business plan for an overnight freight service. By 1972, he had secured financial backing, and Federal Express took to the air in 1973. Federal Express became a new way of shipping goods that revolutionized the cargo shipping business worldwide.

Smith and other entrepreneurs recognize a change in society and its needs, and then, based on their knowledge and skill, they respond with a new way of doing things. Typically, entrepreneurs create a novel response to an opportunity by recombining people, concepts, and technologies into an original solution. Smith saw that the combination of dedicated cargo airplanes, computer-assisted tracking systems, and overnight delivery would serve a new market that required just-in-time delivery of critically important parts, documents, and other valuable items. Smith adapted computer technology to manage the complex task of tracking and moving packages. More fundamentally, Smith matched his passions and skills as a person with a good opportunity.

An **opportunity** is a favorable juncture of circumstances with a good chance for success or progress. Attractive opportunities combine good timing with realistic solutions that address important problems in favorable contexts. It is the job of the entrepreneur to locate new ideas, to determine whether they are actual opportunities, and, if so, to put them into action. Thus, **entrepreneurship** may be described as the nexus of enterprising individuals and promising opportunities [Shane and Venkataraman, 2000]. As illustrated in Figure 1.1, the "sweet

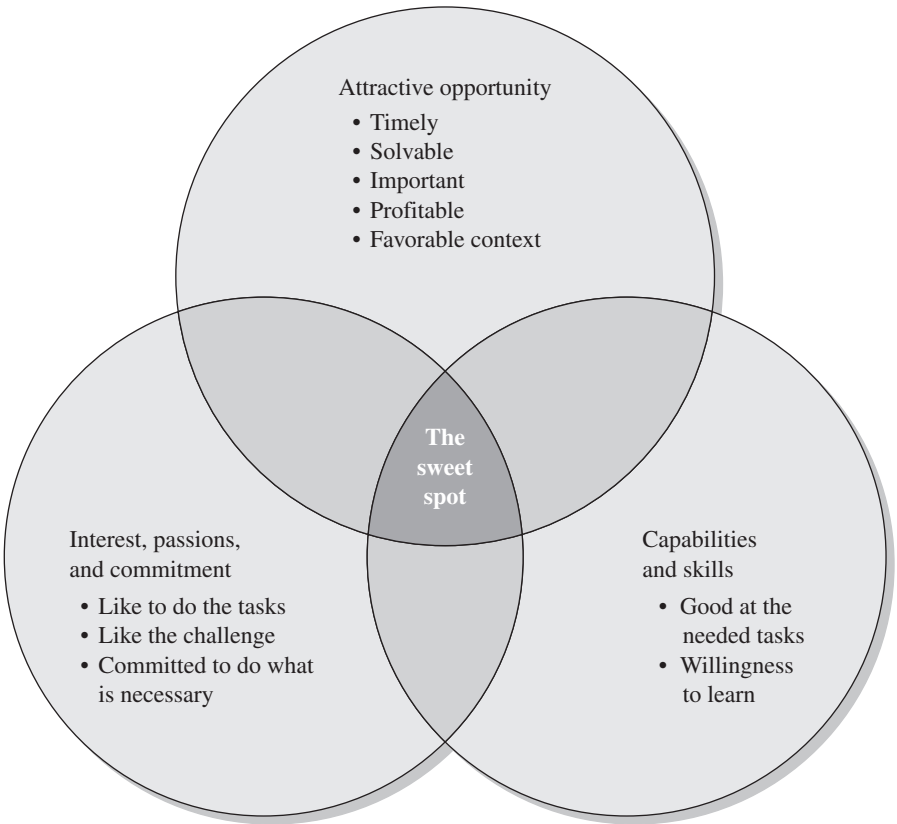

FIGURE 1.1 Selecting the right opportunity by finding the sweet spot.

spot" exists where an individual's or team's passions and capabilities intersect with an attractive opportunity.

Entrepreneurship is not easy. Only about one-third of new ventures survive their first three years. As change agents, entrepreneurs must be willing to accept failure as a potential outcome of their venture. But, regardless of whether the right opportunity has emerged, a person can learn to act as an entrepreneur by trying the activity in a low-cost manner. To avoid the realm of daydreams and fantasy, a person needs to start the practice of experimenting, testing, and learning about his or her entrepreneurial self [Ibarra, 2002]. The would-be entrepreneur should, therefore, engage in this sequence: do it, then reflect on it.

The first step is to craft small experiments in new activities with entrepreneurial teams or small ventures. Through these small experiments, the entrepreneur develops new contacts and mentors, while learning more about the process

TABLE 1.2 Four steps to starting a business.

1. The founding team or individual has the necessary skills or acquires them.
2. The team members identify the opportunity that attracts them and matches their skills. They create a solution to match the opportunity.
3. They acquire (or possess) the financial and physical resources necessary to launch the business by locating investors and partners.
4. They complete an arrangement or contract with their partners, with investors, and within the founder team to launch the business and share the ownership and wealth created.

of pursuing an opportunity. He or she may also find a challenge that serves as a catalyst for a new venture. If team members identify an opportunity that attracts them and matches their skills, they next obtain the resources necessary to implement their solution. Finally, they launch and grow an organization, which can grow to have a massive impact, like those enterprises listed in Table 1.1. These four steps to starting a business are outlined in Table 1.2.

Ultimately, entrepreneurship is centrally focused on the identification and exploitation of previously unexploited opportunities. Fortunately for the reader, successful entrepreneurs do not possess a rare entrepreneurial gene. Entrepreneurship is a systematic, organized, rigorous discipline that can be learned and mastered [Drucker, 2002]. This textbook will show you how to identify true business opportunities and how to start and grow a high-impact enterprise.

1.2 The Entrepreneur

The entrepreneur is a bold, imaginative deviator from established business methods and practices who constantly seeks the opportunity to commercialize new products, technologies, processes, and arrangements [Baumol, 2002]. Entrepreneurs thrive in response to challenges and look for unconventional solutions. They apply creativity, create visions, build stories that explain their visions, and then act to be part of the solution. They forge new paths and risk failure, but persistently seek success. Entrepreneurs distinguish themselves through their ability to accumulate and manage knowledge, as well as their ability to mobilize resources to achieve a specified business or social goal [Kuemmerle, 2002].

Entrepreneurs engage in eight key activities, as described in Table 1.3. They identify and select opportunities that match their skills and interests, they acquire resources, and they start organizations.

In order to successfully pursue these activities, entrepreneurs should possess several important capabilities, as noted in Table 1.4. Entrepreneurs are opportunity driven and work to find a strategy that can reasonably be expected to bring that opportunity to fruitful success. They seek new means

TABLE 1.3 Eight skills of entrepreneurship.

- Entrepreneurs initiate and operate a purposeful enterprise.
- Entrepreneurs operate within the context and industrial environment at the time of initiation.
- Entrepreneurs identify and screen timely opportunities.
- Entrepreneurs accumulate and manage knowledge and technology.
- Entrepreneurs mobilize resources—financial, physical, and human.
- Entrepreneurs assess and mitigate uncertainty and risk associated with the initiation of the enterprise.
- Entrepreneurs provide an innovative contribution or at least a contribution that encompasses novelty or originality.
- Entrepreneurs enable and encourage a collaborative team of people who have the capabilities and knowledge necessary for success.

or methods and are willing to commit to solving a social or business problem that will result in success. Entrepreneurs work toward needing shorter time periods to decide on an appropriate strategy and seize opportunities. Entrepreneurs have a passion to build an enterprise that will solve an important problem. They seek ways to express themselves and validate their ideas. They are creative, internally motivated, and attracted to new, big ideas or opportunities.

Entrepreneurs exhibit robust confidence, sometimes bordering on overconfidence [Hayward et al., 2006]. Entrepreneurial innovators tend to exhibit high self-efficacy—the belief that they can organize and effectively execute actions to produce desired attainments [Markman et al., 2002]. They believe they possess the capabilities and insights required for the entrepreneurial task. One or

TABLE 1.4 Required capabilities of the entrepreneurial team.

- Has talent, knowledge, and experience within the industry where the opportunity occurs
- Seeks important opportunities with sizable challenges and valuable potential returns
- Able to select an opportunity in a short period: timely
- Creatively explores a process that results in the concept of a valuable solution for the problem or need
- Able to convert an opportunity in to a workable and marketable enterprise
- Wants to succeed: achievement-oriented
- Able to accommodate uncertainty and ambiguity
- Flexibly adapts to changing circumstances and competitors
- Seeks to evaluate and mitigate the risks of the venture
- Creates a vision of the venture to communicate the opportunity of staff and allies
- Attracts, trains, and retains talented, educated people capable of multidisciplinary insights
- Skilled at selling ideas and have a wide network of potential partners

TABLE 1.5 Elements of the ability to overcome a challenge.

■ Able to deal with a series of tough issues	■ Resilient in the face of setbacks
■ Able to create solutions and work to perfect them	■ Willing to work hard and not expect easy solutions
■ Able to handle many tasks simultaneously	■ Well-developed problem-solving skills
	■ Able to learn and acquire the skills needed for the tasks at hand

more of the entrepreneur team usually have some experience in the industry in which the new venture will be operating.

Good entrepreneurs seek to be flexible so they can adapt to changing conditions and reduce the risks of the venture. They are resilient in the face of setbacks, able to multitask, and exercise well-developed problem-solving skills to overcome challenges. Table 1.5 lists some of the elements of this ability.

Finally, entrepreneurs create an overarching vision of the venture and use it to motivate employees, allies, and financiers. Perhaps the most important qualities or characteristics of an entrepreneur are the abilities to accomplish the necessary tasks, meet goals, and inspire others to help with these tasks. Successful entrepreneurial teams attract, train, and retain intellectually brilliant and educated people capable of multidisciplinary insights [van Praag, 2006].

Members of the entrepreneurial team must, therefore, exhibit leadership qualities. **Leadership** is the ability to create change or transform organizations. Leadership within an organization enables the organization to adapt and change as circumstances require. A real measure of leadership is the ability to acquire needed new skills as the situation changes.

Entrepreneurs vary widely in their backgrounds. Recall the list of entrepreneurs in Table 1.1. The age of these people when they launched their enterprises ranges from 19 to 43. The median age of all technology-based company founders is 39 and many founders are much older [Wadha et al., 2008]. Entrepreneurship is a lifelong pursuit that is accessible to people of all ages. Entrepreneurs are also well educated. Ninety-two percent of technology entrepreneurs surveyed by the Kauffman Foundation hold a bachelor's degree, 31 percent hold a master's degree, and 10 percent hold a Ph.D. At the same time, however, institutions such as the Grameen Bank, which lends primarily to women in the third world so that they can start businesses, have opened up entrepreneurship as a possibility for a wide range of people.

In general, entrepreneurs should have most of the qualities listed in Table 1.4 in order to participate in a new venture. But, not everyone will have the same blend of capabilities. In order to strengthen, diversify, and complement an organization's skills, insights, resources, and connections, most entrepreneurs work as part of a team.

Moreover, entrepreneurship is an attitude and capability that diffuses beyond the founding team to all members of an organization. Most growing

TABLE 1.6 Factors people use to determine whether to act as entrepreneurs.

Positive factors or benefits	
■ Independence: Freedom to adapt and use their own approach to work and flexibility of work, autonomy	■ Self-realization: Recognition, achievement, status
■ Financial success: Income, financial security	■ Innovation: Creating something new
	■ Roles: Fulfilling family tradition, acting as leader
Negative factors	
■ Risk: Potential for loss of income and wealth	■ Work effort and stress: Level of work effort required, long hours, constant anxiety

firms strive to infuse the culture of the entire company with the entrepreneurial spirit. For example, Thomas Edison created an enterprise that became General Electric; Steve Jobs and Steve Wozniak founded Apple Computer; and Azim Premji started Wipro Technologies. These entrepreneurs combined their knowledge of valuable new technologies with sound business practices to build important new enterprises that continued to maintain their entrepreneurial spirit for years after founding.

Members of an entrepreneurial team decide whether to act as entrepreneurs based on the seven factors listed in Table 1.6 [Gatewood, 2001]. Good entrepreneurs tend to seek independence, financial success, self-realization, validation of achievement, and innovation, while fulfilling leadership roles. At the same time, potential entrepreneurs evaluate the risk and work efforts associated with an opportunity and balance them with the benefits. Successful entrepreneurs are able to answer positively the five questions listed in Table 1.7 [Kuemmerle, 2002].

Context can have an important effect on whether or not someone becomes an entrepreneur [Sørenson, 2007]. For example, people whose colleagues are entrepreneurial are more likely to become entrepreneurs themselves [Stuart and Ding, 2006]. Similarly, younger and smaller organizations are more likely to

TABLE 1.7 Five questions for the potential entrepreneur.

■ Are you comfortable stretching the rules and questioning conventional wisdom?	■ Are you willing and able to shift strategies quickly?
■ Are you prepared to take on powerful competitors?	■ Are you a good deal closer and decision maker?
■ Do you have the perseverance to start small and grow slowly?	

spawn entrepreneurs [Dobrev and Barnett, 2005]. Environmental changes, such as an increase in the availability of venture capital financing, also affect the decision to become an entrepreneur [Hsu et al., 2007].

On an individual level, people act as self-employed entrepreneurs when that career path is felt to be better than employment by an existing firm. Consider the satisfaction (utility) derived from an employment arrangement. A utility function, U, is [Douglas and Shepherd, 1999]:

$$U = f(Y, I, W, R, O)$$

where Y = income, I = independence, W = work effort, R = risk, and O = other working conditions. It may be assumed that income depends in turn on ability. People will have an incentive to be entrepreneurs when the most satisfaction (utility) is obtained from the entrepreneurial activity. In other words, entrepreneurship pays off due to higher expected income and independence when reasonable levels of risk and work efforts are required.

For new entrepreneurial activities, the results of the venture are less known, and expected returns, independence, work effort, and risk can only be estimated. Potential entrepreneurs must be careful to do an honest assessment of their motivation and skills [Wasserman, 2008]. Regrettably, many entrepreneurs overweigh the benefits of independence and income, and underestimate the work effort required.

Based on the utility function above, we may postulate a utility index that we will call the Entrepreneurial Attractiveness (EA) index [Levesque et al., 2002]. For each factor (Y, I, W, and R), we use a scale of 1 to 5 with 1 = low, 3 = medium, and 5 = high.

$$EA = (Y + I) - (W + R) \tag{1.1}$$

As a simple example, consider the straightforward alternatives for a successful marketing manager in the electronics industry. She can earn $60,000 annually in her existing job (Y in equation 1.1). However, she values the independence of the new venture highly (I). The work effort for the new venture is estimated to be the same as for her current work (W). However, the risk is higher for the new independent venture (R). The potential entrepreneur estimates that she can obtain the same income over the next two years, although she will need a four-month period with a lower income at the start. The entrepreneur can compare the two options across these dimensions as shown in Table 1.8. In this case, over the first two years, the benefits of the new venture are Y + I = 8, and the costs of the venture are W + R = 7. The benefits of the existing job are equal to 5, and the costs are 6. Therefore,

$$\text{New venture: } (Y + I) - (W + R) = 8 - 7 = +1$$
$$\text{Existing job: } (Y + I) - (W + R) = 5 - 6 = -1$$

The new opportunity looks more favorable due to this entrepreneur's desire for independence. Thus, it warrants in-depth analysis.

TABLE 1.8 Summary of the entrepreneur's analysis of a new opportunity and the opportunity cost using a two-year period.

Factor	New venture	Existing job
Income over	$120,000	$120,000
two years (Y)	Y = 3	Y = 3
Independence (I)	I = 5	I = 2
Work effort (W)	W = 4	W = 4
Risk (R)	R = 3	R = 2

In summary, entrepreneurs are multitalented individuals who leverage their capabilities and interests to pursue a particular opportunity, almost always with the help of a team.* The decision to pursue an entrepreneurial path and a particular opportunity is determined by weighing the benefits of independence and income against the work effort required and the risk of the venture. In chapter 2, we learn how a potential entrepreneur can evaluate an idea to determine if it is an actual opportunity.

1.3 Economics and the Firm

All entrepreneurs are workers in the world of economics and business. **Economics** is the study of the production, distribution, and consumption of goods and services. Society, operating at its best, works through entrepreneurs to effectively manage its material, environmental, and human resources to achieve widespread prosperity. An abundance of material and social goods equitably distributed is the goal of most social systems. Entrepreneurs are the people who arrange novel organizations or solutions to social and economic problems. They are the people who make our economic system thrive [Baumol et al., 2007].

According to Global Entrepreneurship Monitor (GEM) researchers, the United States maintained about a 10 percent entrepreneurial activity rate between 1999 and 2007. This indicated that one in ten adults was engaged in setting up or managing a new enterprise during that period, a rate 50 percent higher than the average of all other participating high-income nations [Phinisee et al., 2008]. New ventures have been the source of an estimated one-half to two-thirds of the new jobs created in the United States over the past two decades, meaning start-ups are a key to economic recovery and job growth [Stangler, 2009]. The entrepreneur turns a social problem into an opportunity, a productive organization, and new, well-paid jobs.

*Throughout this book, the word *entrepreneur* will refer to an individual or a team of individuals.

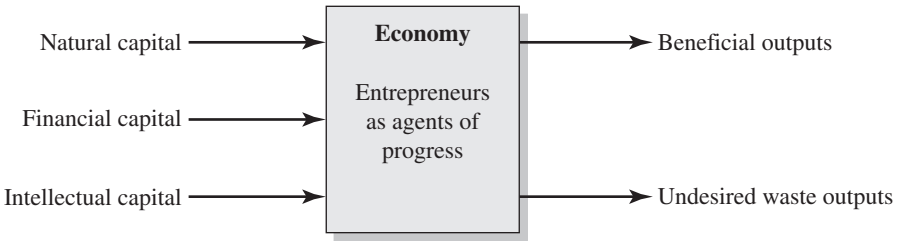

FIGURE 1.2 A model of the economy.

An economic system is a system for the production and distribution of goods and services. Given the limitations of nature and the unlimited desires of humans, economic systems are schemes for (1) administering scarcities and (2) improving the system to increase the abundance of goods and services. For a nation as a whole, its wealth is its food, housing, transportation, health care, and other goods and services. A nation is wealthier when it has more of these goods and services. Nations strive to secure more prosperity by organizing to achieve a more effective and efficient economic system. It is entrepreneurs who organize and initiate that change.

Almost all variation in living standards among countries is explained by **productivity,** which is the quantity of goods and services produced from the sum of all inputs, such as hours worked and fuels used. A model of the economy is shown in Figure 1.2. The inputs to the economy are natural capital, financial capital, and intellectual capital. The outputs are the desired benefits or outcomes and the undesired waste. An appropriate goal is to maximize the beneficial outputs and minimize the undesired waste [Dorf, 2001].

Natural capital refers to those features of nature, such as minerals, fuels, energy, biological yield, or pollution absorption capacity, that are directly or indirectly utilized or are potentially utilizable in human social and economic systems. Because of the nature of ecologies, natural capital may be subject to irreversible change at certain thresholds of use or impact. For example, global climate change poses a serious threat to sources of natural capital.

Financial capital refers to financial assets, such as money, bonds, securities, and land, which allow entrepreneurs to purchase what they need to produce goods and services. The **intellectual capital** of an organization includes the talents, knowledge and creativity of its people, the efficacy of its management systems, and the effectiveness of its customer and supplier relations. The sources of intellectual capital are threefold: human capital, organizational capital, and social capital. **Human capital** (HC) is the combined knowledge, skill, and ability of the company's employees. **Organizational capital** (OC) is the hardware, software, databases, methods, patents,

TABLE 1.9 Three elements of the intellectual capital (IC) of an organization.

Human capital (HC): The skills, capabilities, and knowledge of the firm's people
Organizational capital (OC): The patents, technologies, processes, databases, and networks
Social capital (SC): The quality of the relationships with customers, suppliers, and partners
IC = HC + OC + SC

and management methods of the organization that support the human capital. **Social capital** (SC) is the quality of relationships with a firm's suppliers, allies, partners, and customers. These elements of intellectual capital are summarized in Table 1.9.

The economy as portrayed in Figure 1.2 consists of the summation of all organizations, for-profit as well as nonprofit and governmental, that provide the beneficial outputs for society. These are the organizations that we study and will label as enterprises or firms*. Entrepreneurs constantly form new organizations or enterprises to meet social and economic needs.

The purpose of a firm is to establish an objective and mission and carry it out for the benefit of the customer. Thus, the purpose of Merck Corporation is to create pharmaceuticals that protect and enhance its customers' health. To do so, each individual firm transforms inputs into desirable outputs that serve the needs of customers.

A firm exists as a group of people because it can operate more effectively and efficiently than a set of individuals acting separately. Furthermore, a firm creates conditions under which people can work more effectively than they could on their own. Thus, firms exist to coordinate and motivate people's economic activity [Roberts, 2004]. A firm is more effective because (1) it has lower transaction costs and (2) the necessary skills and talent are gathered together in effective, collaborative work.

A model of the firm as a transformation entity is shown in Figure 1.3. The transformation of inputs into desired outputs is based primarily on the intellectual capital and the entrepreneurial capital of the firm. As an example, consider Microsoft, a powerful software firm. It creates and purchases technologies, develops new software, and builds a client base. The transformation of its inputs into outputs is based on its formidable stock of entrepreneurial capital and intellectual capital.

Entrepreneurial capital (EC) can be formulated as a combination of entrepreneurial competence and entrepreneurial commitment [Erikson, 2002]. **Entrepreneurial competence** is the ability (1) to recognize and envision taking advantage of opportunity and (2) to access and manage the

* Henceforth, we use firm to represent organizations, enterprises, and corporations.

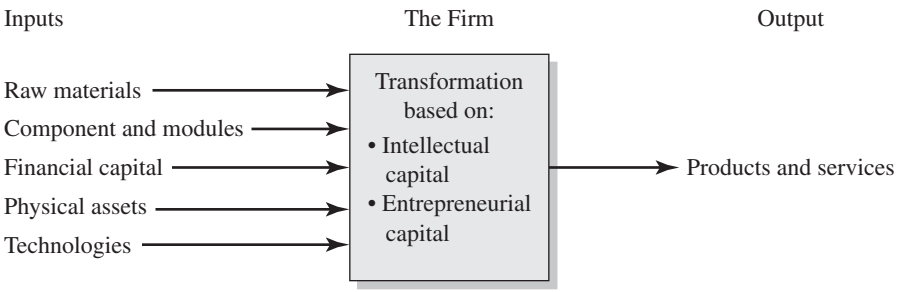

FIGURE 1.3 The firm as transforming available inputs into desired outputs.

necessary resources to actually take advantage of the opportunity. **Entrepreneurial commitment** is a dedication of the time and energy necessary to bring the enterprise to initiation and fruition. The presence of competence without any commitment creates little entrepreneurial capital. The presence of commitment without competence may waste both time and resources. Both commitment and competence are required to provide significant entrepreneurial capital. Thus, we can say that

Entrepreneurial Capital = entrepreneurial competence × entrepreneurial commitment

or

$$EC = Ecomp \times Ecomm \tag{1.2}$$

where Ecomp is entrepreneurial competence and Ecomm is entrepreneurial commitment. Note that the symbol × is a multiplication sign, but it should be recognized that this equation is qualitative in nature.

The accretion of knowledge and experience over time leads to increased competence as people mature. However, commitment of energy and time may decline when people become less interested in or available for the necessary entrepreneurial competence activities. Both commitment and competence are qualities of the leadership team, and they may be complementary qualities shared among the team members.

To transform inputs into outputs, the firm also acts to develop, attract, and retain intellectual capital. The firm develops and uses intellectual capital to build the strengths of the firm and to provide the desired products.* The firm provides a place where people can collaborate, learn, and grow.

Intellectual capital can be thought of as the sum of knowledge assets of an organization. This knowledge is embodied in the talent, know-how, and skills of the members of an organization. Thus, a firm needs to attract and retain the best people for its requirements in the same way that it seeks the best technologies

* Henceforth, we use products to refer to products and services.

or physical assets. Knowledge is one of the few assets that grows when shared. By organizing around intellectual capital, a new firm strives to leverage it, usually through collaboration, development, and sharing.

The intellectual capital of a firm is used to transform raw material into something more valuable. Antinori succeeds because of the human capital of its grape growers and wine makers. KFC relies on the organizational capital of its recipes and processes. A local café where the waiter recognizes you and knows your favorite latté relies on its social capital. Social capital is based on strong, positive relationships.

The firm's actions are based on its knowledge of its customer, its product, and its markets. The firm must identify and understand its customers, its competitors, and their values and behavior. Knowledge of organizations, design, and technologies is filtered through a firm's strengths and weaknesses. The firm acts on all this knowledge.

First, a firm is clear about its mission and purpose. Second, the firm must know and understand its customers, suppliers, and competitors. Third, a firm's intellectual capital is understood, renewed, and enhanced as feasible. Finally, the firm must understand its environment or context, which is set by society, the market, and the technology available to it. We can call this the **theory of a firm's business,** or how it understands its total activities, resources, and relationships. Figure 1.4 depicts the business theory of

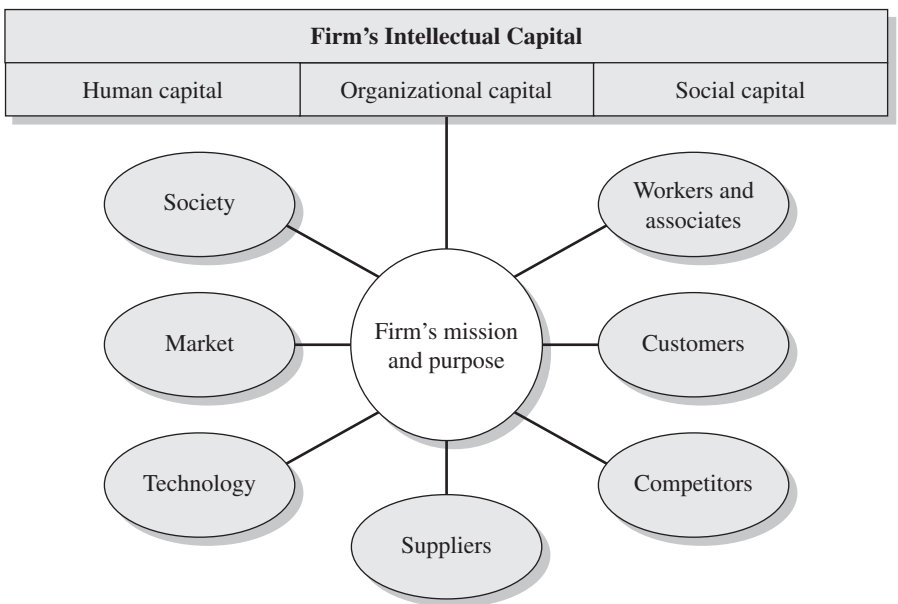

FIGURE 1.4 A firm's theory of business depicts how it understands and uses its total resources, activities, and relationships.

a firm. One hundred years ago, firms were hierarchical and bureaucratic with a theory of business that emphasized making long runs of standardized products. They regularly introduced "new and improved" varieties and provided lifetime employment. Today, firms compete globally with high-value, customized products. They use flattened organizations and base their future on intellectual capital. Firms look to brands and images to cut through the clutter of messages. In the future, a firm's human capital—talent—will become even more important.

One way to look at the future of a firm is as a competition among its stakeholders. Flexibility and leanness mostly benefit the firm's shareowners. Stakeholders include not only these shareholders, but also workers, customers, people in the community, and society in general. Placing a high valuation on talent gives more power to the workers. Customers stand to gain power as competitors vie for their attention. A good reputation means the firm needs to look after its community and society. The entrepreneur in the new firm strives to build a firm that serves all its stakeholders well.

1.4 Creative Destruction

One view of economic activity describes a world of routine in which little changes. In this static model, all decisions have been made, and all alternatives are known and explored. But clearly, no economy is static, and change appears to be certain.

Dynamic capitalism is the process of wealth creation characterized by the dynamics of new, creative firms forming and growing and old, large firms declining and failing. In this model, it is disequilibrium—the disruption of existing markets by new entries—that makes capitalism lead to wealth creation [Kirchhoff, 1994]. New firms are formed by entrepreneurs to exploit and commercialize new products or services, thus creating new demand and wealth. This renewal and revitalization of industry leads to a life cycle of formation, growth, and decline of firms.

The recorded music industry provides a good example of waves of change. Music lovers listened to their favorite music recorded on vinyl discs until about 1980, when cassette tapes grew in popularity. The compact size and recordability of the cassette tape caused a massive shift from vinyl records to tape. By the late 1980s, however, compact discs (CDs) overshadowed cassettes, due to the CD's better sound quality and instant access to tracks. In turn, the CD business peaked in 1995 just as the Internet was gaining momentum in society at large. A few years later, peer-to-peer file transfer began to allow piracy of music. By 2001, Apple had introduced the iPod and iTunes and eventually gained a commanding position in the music distribution and sales business. In a dynamic economy, companies need to reinvent their business arrangements or end up becoming irrelevant [Knopper, 2009].

Joseph Schumpeter (1883–1950) described this process of new entrepreneurial firms and waves of change as **creative destruction.** Born and educated

in Austria, Schumpeter taught at Harvard University from 1932 until his death in 1950. His most famous book, *Capitalism, Socialism and Democracy,* which appeared in 1942 [Schumpeter, 1984], argued that the economy is in a perpetual state of **dynamic disequilibrium.** Entrepreneurs upend the established order, unleashing a gale of creative destruction that forces incumbents to adapt or die. Schumpeter argued that the concept of perfect competition is irrelevant because it focused entirely on market (price) competition, when the focus should be on technological competition. Creative destruction incessantly revolutionizes the economic structure from within, destroying the old structure and creating a new one. The average life span of a company in the Standard and Poors 500 declined from 35 years in 1975 to less than 20 years today. Less than 4 of the top 25 technology companies 30 years ago are leaders today—perhaps only IBM and Hewlett-Packard.

In a world of change, entrepreneurs seek to embrace it. Entrepreneurs match ideas for change with opportunity. These changes include the adoption of new and better (or cheaper) sources of input supplies, the opening of new markets, and the introduction of more profitable forms of business organization.

The profit of the new firm is the key to economic growth and progress. By introducing a new and valuable product, the innovator obtains temporary monopoly power until rivals figure out how to mimic the innovation. Lower costs may give the innovative firm profits higher than those of its rivals, which must continue to sell at higher prices to cover their higher expenses. Alternatively, a superior product may permit a price above that charged by other firms. The same concept clearly fits all forms of successful change. The business system works to drive out inefficiency and forces business process renewal.

Economic progress is reflected in productivity growth, which provides for increases in people's standard of living. Over the past half-century, the U.S. workforce (including immigration) has grown at about 1.7 percent annually, and productivity per worker has risen at 2.2 percent, generating real economic growth (excluding inflation) averaging 3.9 percent. This is an excellent record, due in great part to the impact of technology entrepreneurship.

Rising output per worker comes from two sources: (1) new technology and (2) smarter ways of doing work. Both paths have been followed throughout human history, and they became faster tracks with the coming of the Industrial Revolution. The twentieth century started with new techniques of management and many new inventions. The century ended with smarter management techniques and dramatic advances in electronic technology, which helped revive productivity growth after limited gains through much of the 1970s and 1980s.

The free spirit of entrepreneurs provides the vital energy that propels this capitalist system. During the past 30 years, the forces of entrepreneurship, competition, and globalization have encouraged new technologies and business methods that raise efficiency and efficacy. In recent years, due to competition, many of the benefits of strong productivity have flowed to consumers in the

form of lower prices. Together, innovation, entrepreneurship, and competition are important sources of productivity growth.

1.5 Innovation and Technology

Little doubt now exists that the economy is driven by firms that capitalize on change, technology, and challenge. This book is focused on helping the reader to purposefully become an agent for creative destruction by creating his or her own firm. An example of an agent for creative destruction is Craig Venter, who founded Synthetic Genomics in order to use modified or synthetically produced microorganisms to create ethanol and hydrogen. The company is attempting to capitalize on the growing interest in alternative fuels and to design and synthesize specifically engineered cells to perform particular tasks.

New technologies such as these are often a source of disequilibrium or discontinuity, and Schumpeter's theory was based on disruptive, or "radical," innovations. **Technology** includes devices, artifacts, processes, tools, methods, and materials that can be applied to industrial and commercial purposes. For example, Intel was formed to apply semiconductor technology to the design and manufacture of semiconductor circuits. Microsoft was formed to create and distribute computer software products for applications in industry and the home. Apple has reshaped itself around mobile communications and mobile media technologies.

Modern entrepreneurial firms breed a constant flow of high-impact products that create value and stimulate economic growth by bringing new methods, technologies, and ideas to the global marketplace [Schramm, 2004]. Figure 1.5 illustrates "waves" of innovation based upon different technologies throughout history. Modern entrepreneurial firms are at the forefront of the sixth wave, which places a special emphasis on sustainability.

Population growth and a worldwide rising middle class, combined with tightening energy supplies and fears of climate changes, have prompted a move toward socially and environmentally responsible business. The goal is to provide housing, transportation, and energy systems that use less energy and emit less pollution and carbon dioxide. The concept is to use knowledge and innovation to create and implement sustainable energy systems and to increase resource productivity [Friedman, 2008].

A clean energy system would consist of a mixture of energy generation, transmission, and utilization in ways that best use natural resources and minimize environmental impacts. By clean and green we mean a system based on conservation, best uses of natural resources, and minimizing environmental impacts. Examples of green technology solutions include installing carbon capture systems at power plants, increasing the use of wind power systems, and developing high-efficiency biofuel systems. Improving the reliability and smart control of the electricity grid also offers a good opportunity for entrepreneurs.

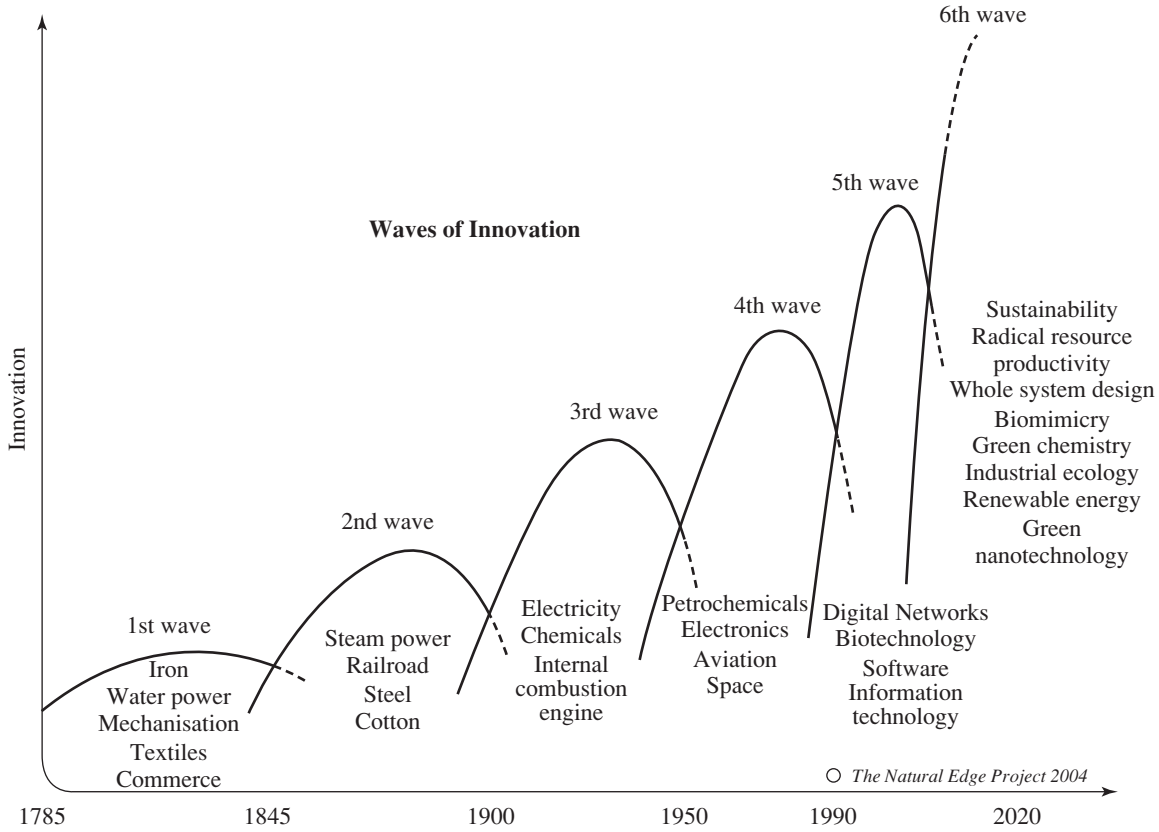

FIGURE 1.5 Waves of innovation throughout history.

As the green technology movement highlights, technology entrepreneurship is based upon intellectual capital. One hundred years ago, successful companies such as U.S. Steel were primarily managing physical assets. By contrast, today's successful firms, such as Microsoft and Genentech, manage knowledge and intellectual capital. In fact, for many, if not most, firms, intellectual capital is the organization's most important asset, more valuable than its other physical and financial assets. Many firms depend on their patents, copyrights, and software, and the capabilities and relationships of their people. This intellectual capital, appropriately applied, will determine success or failure. Thus, knowledge has become the most important factor of production.

While innovation and intellectual property are critical, however, a dynamic economy ultimately rests on the actions of entrepreneurs who assume and accept the benefits and risks of an initiative. It is people acting as leaders, organizers, and motivators who are the central figures of modern economic activity.

Three factors make up entrepreneurial action: (1) a person or group who is responsible for the enterprise, (2) the purposeful enterprise, and (3) initiation and growth of the enterprise. The individuals responsible for the organization were described in section 1.2. The purposeful enterprise may be a new firm organized for a suitable and attractive purpose or a new unit within or separated from an existing business corporation. Furthermore, the organization may be based on radical innovation, incremental changes, imitation, or rent-seeking behavior.

In the first type of enterprise, the entrepreneur engages in an innovative activity that results in novel methods, processes, and products. The second form emphasizes the founding and management of a business that builds upon and improves an existing product or service. The imitative venture is founded by an entrepreneur who is involved in the rapid dissemination of an innovative idea or process. This person or group finds a novel innovation and transfers it to another environment, region or country. The final means of entrepreneurship is called rent-seeking or profit-seeking and focuses on the use of regulation, standards, or laws to appropriate some of the value of a monopoly that is generated somewhere in the economy.

In this book, we emphasize the creation of the venture that capitalizes on technological changes and that will have a significant impact on a region, a nation, or the world. A new regulation or clever financial restructuring may afford the entrepreneur a new opportunity. But, a radical or transforming innovation may provide an entrepreneur an important opportunity to make a productive and very significant contribution to the world as we know it.

1.6 The Sequential Case: AgraQuest

The AgraQuest case illustrates and illuminates the issues raised in each chapter. It focuses on a real-life emerging firm in the life science industry that illustrates each factor described in a chapter. AgraQuest (www.agraquest.com) is an entrepreneurial firm that may significantly contribute to improved environmental and social conditions and agricultural industries around the world. Read the segment on the case at the end of each chapter and learn of a real-life effort that could make a big difference to the world.

Every seven years in the woodsy town of Killingworth, Connecticut, where she grew up, Pamela Marrone would feel the droppings of gypsy moth caterpillars raining down on her head as the cyclical pests gorged on maples and oaks. Desperate to save a heavily infested dogwood, her father once ignored his own organic gardening tenets and blasted the tree with a chemical called a carbamate.

By the next morning, every bee, every ladybird beetle, every lacewing—all the "good" bugs that fed on plant pests—lay dead on the ground. In her youth, Marrone knew that she wanted to keep the good bugs while deterring

bad pests. She recognized a great opportunity that, if solved, could help farmers prosper while using natural pest control agents (not chemicals). Furthermore, as a youth, Marrone had tried, with her parents' encouragement, several modest entrepreneurial ventures at craft fairs and state fairs.

Marrone studied entomology (the study of the forms and behavior of insects) at Cornell University, going on to North Carolina State University, from which she received her doctorate in 1983. She then spent seven years as the leader of the new pest control unit at Monsanto in St. Louis, where she acted on her dedication to the natural control of pests. At Monsanto, Marrone built her technical and entrepreneurial skills. As a result, in 1990 she was recruited by Novo Nordisk, a Danish company, to create a biopesticide subsidiary called Entotech Inc. in Davis, California.

Entotech's goal was to hunt for natural products that can defeat plant scourges without wreaking havoc on human beings, animals, helpful insects, or soil. But in 1995, Entotech was sold to Abbott Laboratories, prompting Marrone to start her own firm to meet the challenge of building a successful company that would use a new search process for identifying natural products for pest control. Thus was born AgraQuest. Marrone possessed the interest and passion, the capabilities and skills, and saw an attractive opportunity in the sweet spot of Figure 1.1.

1.7 Summary

The entrepreneur is the creative force that allows free enterprise to flourish. Entrepreneurship is the process through which individuals and teams bring together the necessary resources to exploit opportunities and in doing so create wealth, social benefits, and prosperity.

The critical ideas of this chapter are:

- The entrepreneur as creator of a great enterprise.
- The entrepreneur responds to an attractive opportunity.
- A person can learn to be an entrepreneur.
- The entrepreneur knows how to use knowledge to create innovation and new firms.
- Positive entrepreneurship activity flows from a combination of entrepreneurial capital and intellectual capital that leads to productivity and prosperity.
- The entrepreneur uses an appropriate organizational structure to achieve his or her goals.

Principle 1
Entrepreneurs develop enterprises with the purpose of creating prosperity and wealth for all participants—investors, customers, suppliers, employees, and themselves—using a combination of intellectual capital and entrepreneurial processes.

Video Resources

Visit http://techventures.stanford.edu to view experts discussing content from this chapter.

Entrepreneurial Skills Learned	Mark Zuckerberg	Facebook
Do What You Like to Get Where You Want	John Melo	Amyris
Technology Cycles Start with a Breakthrough Innovation	Judy Estrin	JLabs
Broad Environmental Solutions Require Brawny Change	Vinod Khosla	Khosla Ventures

1.8 Exercises

1.1 What is the difference between an idea and an opportunity? Why is this difference important to entrepreneurs?

1.2 Consider opportunities that have occurred to you over the past month and list them in a column. Then, describe your strong interests and passions, and list them in a second column. Finally, create a list of your capabilities in a third column. Is there a natural match of opportunity, interests, and capabilities? If so, does this opportunity appear to offer a good chance to build an enterprise? What would you need to do to make this opportunity an attractive chance to build an enterprise business?

1.3 Name an entrepreneur that you personally admire. Why do you consider this person to be an entrepreneur? What sets him or her apart from other business leaders? What path did this person take to entrepreneurship? What personal sacrifices or investments did this person make in the journey? What people were important to this person's success?

1.4 Name a successful entrepreneurial team you personally admire. How would you classify it in the context of the entrepreneur capabilities shown in Table 1.4? Do these elements of entrepreneurship apply to it?

1.5 Research the number of companies that either had an IPO (initial public offering) or have been acquired in the last five years. What industries were these companies in? Where is the number of IPOs vs. M&As (mergers and acquisitions) trend leading? What implications does this have on the number of new ventures being started?

1.6 Given an understanding of the waves of innovation throughout history (Figure 1.5), explore opportunities that are created in a wave after the peak. For example, how can an entrepreneur take advantage of a mature or declining market?

VENTURE CHALLENGE

Select a high-potential opportunity that interests you and then use it for the venture challenge exercises at the end of each chapter. For example, you might consider one of these current trends in science and technology: mobile applications, Internet and services, nanotechnology, clean technologies, pandemic and biodefense treatments, and advancements in stem cell research.

1. Describe the opportunity that attracts you and why you think it is a new venture opportunity.
2. Describe the competencies and skills you and your team members possess.
3. What important stakeholders will you need to be successful?
4. Describe the passion and commitment you have for the opportunity.
5. Is this a good opportunity for you?