CHAPTER 2

Five Pillars of Technology Entrepreneurship

iWANAMAKER EXPLORES ITS MARKET OPPORTUNITY

iWanamaker is a live-scoring golf app that is designed to allow golfers to keep track of their scores on their smartphones. When founder Doyle Heisler first came up with the idea for the app, he envisioned that golfers and golf clubs would be as excited about the app as he was. When he took the app to clubs for them to use in their tournaments, he learned that club pros were reluctant to purchase it because of the low margins in the golf industry and their general aversion to innovation and change. Doyle next decided to market his product directly to the charities that run golf tournaments as fundraisers. He thought they would be interested in the product as it makes golf more fun for players and offers sponsor opportunities within the app itself. Again, however, he learned that charities are also averse to spending additional money on their golf tournaments and are indifferent to the new technology.

As a result of these two initial failures to penetrate the lucrative golf market, Doyle decided to pivot to a new business model. Realizing that the more golfers that use the product the more he can charge for advertising, he decided to experiment with a "freemium" business model where he would virtually give the app to golf clubs and charities, and sell advertising to local and national brands that wanted exposure to golfers. As this book is going to press, iWanamaker 2.0 is about to be released under this revised business model. Time will tell if this is the model that leads to venture growth. The important thing is that Doyle was willing to change his business model based on what the market was telling him about his product and its features.

Author Duening was an investor in and board member to iWanamaker at the time this book was going to press.

2.1 INTRODUCTION

Chapter 1 examined the focus and purpose of this book and some of the leading trends and challenges for technology entrepreneurs in the modern global economy. We hope that your appetite is now whetted for a lifetime of technology entrepreneurship and that you are ready to begin learning some of the practical tools of entrepreneurial expertise. Before we begin, we must warn those of you who are novices that developing entrepreneurial expertise takes

time and practice. In fact, research into what is required to become expert in anything suggests that it can take 10 years or more of what is called *deliberate practice* to achieve expert-level competence.[1] We address the process of deliberate practice in detail later in this chapter and provide you with some suggestions about how you can develop your own entrepreneurial expertise.

The central theme of this chapter is that expert technology entrepreneurs have become adept at certain specific skills and ways of thinking about products and new ventures. These skill sets are referred to as the "five pillars of entrepreneurial expertise." These five pillars are:

1. Value Creation
2. The Lean Startup
3. Customer Discovery and Validation
4. The Business Model Canvas
5. The Entrepreneurial Method

Below we discuss each of these pillars in detail, beginning with the fundamental skill that all technology entrepreneurs must possess: The ability to create value for customers.

2.2 PILLAR #1: VALUE CREATION

Expert technology entrepreneurs know intuitively that value creation is the purpose of business. In fact, it doesn't matter if you are a technology entrepreneur or a fast-food entrepreneur (or any other kind of entrepreneur). Your products and services must create value for customers. There are probably as many ways to create value as there are people on the planet.

Consider the case of three individuals in Menlo Park, California, who set out to create a new type of Internet company in 2005. Menlo Park is located in the heart of Silicon Valley, which has been the birthplace of some of the most rapidly growing technology companies in history. These three individuals were veterans of technology companies, having previously been principals at PayPal. From their garage in Menlo Park, the entrepreneurs created YouTube, one of the fastest growing companies of all time. By July 2006, YouTube reported that more than 100 million videos were being watched and as many as 50,000 videos were being added to the site each day. In October 2006, a mere 10 months after it was launched, YouTube was acquired by Google for $1.65 billion.[2]

The concept of "value" has myriad definitions. Value is defined as whatever customers believe it to be. Technology entrepreneurs can develop successful ventures based on widely different *value propositions*. A value proposition is

what a venture tells its customers about the value it intends to provide to them. For example, the value proposition for YouTube is: "Broadcast yourself." That simple statement, while not necessarily appealing to everyone, is the foundation of the online video-sharing revolution.

Creating value requires vision, passion, and an ability to adjust to customer needs and constantly evolving economic, social, and technological trends and conditions. Successful technology entrepreneurs realize that steadily advancing technologies and technological form factors must be taken into consideration in their product development and design processes. For example, Rovio was a developer of games for mobile phones which were sold at retail. It had developed 50 such products, but none of them became a big hit with users. Nearing the end of its cash flow, Rovio realized that the advent of smartphones, touch-screen technologies, and Apple's new App Store would enable a new breed of games and distribution opportunities. Rovio decided to pivot from its retail-based business model to developing apps for the smart devices that were becoming increasingly ubiquitous. Their breakout product, sold through Apple's App Store, was the popular game "Angry Birds." Rovio reported that the game has been downloaded over two billion times.[3]

Value propositions are important to a venture. They help to communicate the value the venture provides to customers. Value propositions also help guide the venture's internal decision making. For example, the value proposition for well-known consumer products company Procter & Gamble is "Touching lives, improving life."[4] This value proposition tells P&G scientists and product developers how to structure their investment of research and development resources. P&G introduces hundreds of new products to markets around the world each year. The firm's value proposition guides internal decision making about which new products to pursue through multiyear development cycles.[5]

Fundamentally, creating value for customers seems too obvious to mention. Yet, a review of why new ventures fail indicates that the most common reason is because they fail to create appropriate value for customers. Instead, the failed ventures were guided by the founders' vision of the product and its features, with no guidance from customers. Products were designed, built, and released without regard to what customers really want. Of course you know by now that customers, not entrepreneurs, determine what is valuable. Customers don't always know what they want, but they always know what they don't want. Technology entrepreneurs are well-advised always to remember that customers are the ultimate judges of value and determiners of the venture's success.

2.3 PILLAR #2: THE LEAN STARTUP

The Lean Startup was conceived and developed by serial entrepreneur Eric Ries.[6] After a failed technology venture, Ries and his partners launched another technology venture called IMVU. IMVU is an instant-messaging platform that includes a novel feature that no other platform at the time was offering—3D avatars. The founders of IMVU were all technologically savvy—Ries himself is an expert programmer—so there was no question about whether they could build and deliver a working product. The question that perplexed Ries and that he wanted to solve in this new venture was "How do we get customers to buy our product?"

In his previous venture, Ries was convinced that he and his team had built a world-class technology that provided benefits to customers, but not enough customers bought the product after it was launched. Ries understood that there was no lack of effort in the work that he and his partners put into the failed venture. There were also plenty of features and benefits built into the product to attract their target customers. Ultimately, he realized, the problem was that the company ran out of money before it was able to deliver a product that attracted enough customers to generate sufficient cash flow to survive on its own.

In IMVU, Ries wanted to avoid these same problems from the previous venture. When he was between ventures, Ries decided to learn all he could about startup ventures and why they often failed as a result of having too few customers. In particular, he studied the management philosophies and tactics used by companies that excel in manufacturing. He studied Toyota and the world-renowned "Toyota Production System" (TPS). TPS is based on continuous improvement, waste and cost reduction, just-in-time inventory systems, and many other things. In addition, Ries studied the companies that had adopted a technique called "lean manufacturing," which includes many of the same elements of TPS. Lean manufacturing changes the way supply chains and production systems operate. It emphasizes empowering individuals to solve problems as they arise to promote continuous improvement and organizational learning. Lean manufacturing also emphasizes small batch sizes, just-in-time inventory systems, and accelerated cycle times. In short, lean manufacturing is about experimenting, learning, and constantly improving.

Ries realized that the same techniques that are used to continuously improve processes, products, and systems in large manufacturing organizations could be applied to the product development process in startups. Thus, the "Lean Startup" concept was born, and Ries decided to apply that concept aggressively to IMVU's product development during its startup phase. A short overview of IMVU's startup is provided in the Mini-Case below.

MINI-CASE

IMVU Uses Lean Startup Methods to Succeed

When they launched IMVU Ries and his partners thought they had devised a winning strategy. They would make their avatar-based instant messaging technology work on all of the major existing IM platforms, of which there were at least six. Unfortunately, when they launched, they did not attract any customers. So they decided to bring individuals from their target market into their headquarters to find out what was wrong. Talking directly to their target customers revealed several critical pieces of information. Number one, they learned that customers did not want to use the IMVU platform because none of their friends were on it. Further, they didn't want to invite their friends because they were not sure if the system worked—they didn't want to invite their friends to a bad experience. To solve that problem, the IMVU team built a "Chat Now" function which connected the user to a random stranger's avatar so they could meet, chat, and hang out. Customers liked that. When the IMVU team suggested they invite strangers they liked to their existing buddy lists they ran into problem number two. Users did not want to invite total strangers to their existing IM platform buddy lists.

As a result of these customer interactions, Ries and his team learned several important things that changed their marketing strategy:

- Customers loved using their 3D avatars to meet new people
- Customers did not mind adopting another stand-alone IM platform
- Customers would build new buddy lists including some from their other IM platforms

These revelations would have taken too much time to discover if the IMVU team had not brought customers to headquarters for direct interactions. Customers don't often know what they want or need until they are presented with options. Ventures using lean startup methods use experimentation, iteration, and learning to reduce the time and cost involved in discovering what customers really want.

Source: *Ries, E. 2011. The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses. (New York: Crown Business).*

Ries and his team at IMVU presented their nascent product to their customers early and often to learn what they liked, what they didn't like, and what needed to change. The term used to refer to such a nascent product is the *minimal viable product,* or "MVP." The MVP is introduced to potential customers for their feedback, and then based on this feedback a decision is made either to *pivot* to something different or to *persevere* along the current product development pathway. This process is referred to as the Build-Measure-Learn Feedback Loop and is illustrated in Exhibit 2.1.

As the illustration shows, the product development process advocated in the lean startup is circular, iterative, and experimental. Ideas are built into minimally viable products and tested in the target market. As the process cycles on, the product is changed and refined until a sufficient number of customers find that the offering is acceptable. Contrast this approach with the more linear

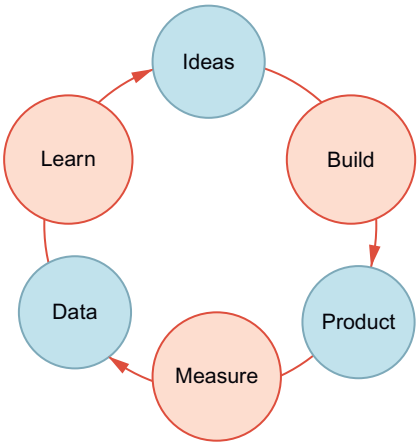

EXHIBIT 2.1
The build-measure-learn feedback loop.

stage-gate product development process used by most large organizations and shown in Exhibit 2.2.

The stage-gate process is characterized by specific "gates" following each stage of the product development process. These gates are managed by people inside the company who adhere to specific metrics to make decisions about whether developing products are allowed to proceed to the next stage. A negative review at any one of these gates results in a product being scrapped. Note in particular that products under development are measured at each gate using *internal* metrics, not direct *feedback* from customers. Unfortunately, too many technology startups still use this approach to product development. Basically, they are playing an all-or-nothing game where the product that makes it to launch had better be what customers want, because it's usually too late to pivot or turn back once the final product is launched.

In addition to the build-measure-learn feedback loop of iterative MVPs, Ries also identified a number of other principles embodied in a lean startup:

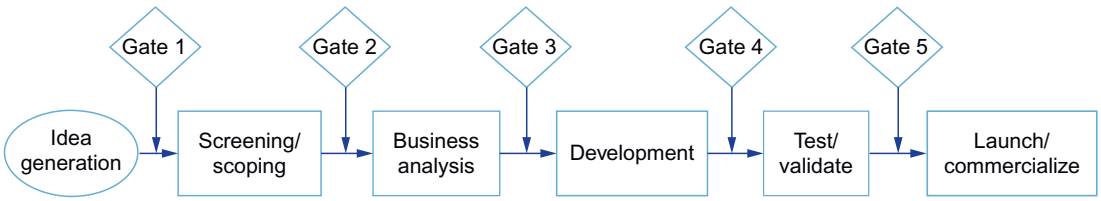

EXHIBIT 2.2
The stage-gate product development process.

Entrepreneurial management: A startup requires management techniques specifically geared to the context of extreme uncertainty. Rather than making complex plans based on "moving target" assumptions, management in a startup needs the discipline to adhere to the build-measure-learn feedback loop of iterative MVPs. This discipline enables entrepreneurs to make constant adjustments to the direction taken by the venture and to make the sometimes hard decisions to pivot or persevere. The startup should not focus on how closely work proceeds according to a preconceived plan, but rather on achieving validated learning milestones. This can sometimes be best achieved by organizing people into flexible cross-functional teams, rather than separate departments dedicated to particular functions.

Validated learning: The goal of a startup is to *learn* how to build a repeatable, scalable, business model. This requires entrepreneurs to run experiments that are rigorous and conclusive in order to test each element of their business model. Exposing customers early and often to a series of MVP releases and getting feedback from customers ensures that maximal learning is occurring at minimal expense.

Innovation accounting: Since the startup cannot measure its success by virtue of standard business measures such as revenue and profitability (at least in the early days), it needs to measure something else, for example, how much the venture is learning and its progress towards finding a scalable, repeatable business model.

The lean startup is a particularly compelling framework for technology entrepreneurs because they often have opportunities to learn customer needs and wants with less-than-perfect finished products. Of course, technology categories such as medical devices are not able to go to market with products that are flawed. Medical devices can't go to market at all until they pass through rigorous Federal Drug Administration (FDA) testing and approvals. Still, technology entrepreneurs of all stripes should consider how they can develop minimally viable products they can run through the build, measure, learn cycle to meet market needs.

2.4 PILLAR #3: CUSTOMER DISCOVERY AND VALIDATION

Customer discovery and validation should be the primary focus of technology entrepreneurs during the startup phase of their company. Blank and Dorf have reconceptualized the startup venture as a *temporary organization*, which means that the startup is fundamentally different from an established organization in that the startup must *discover* a scalable, repeatable business model. Once that has been achieved, via customer discovery and validation, then the company must transition from *searching* for a business model to *executing* a business model. In other words, it transitions from being a startup venture to an established organization. This is illustrated in Exhibit 2.3.

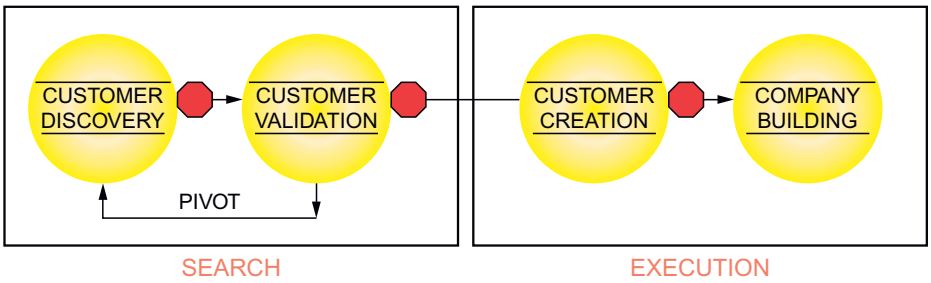

EXHIBIT 2.3
The customer development process.

As the left-hand side of this diagram shows, the focus for the startup should be customer discovery and validation as it searches for a scalable, repeatable business model. There is no mystery in this. Clearly one of the more common reasons that a startup fails is that it executes a preconceived business model that simply doesn't work with customers. A standard (and misleading) view of the technology startup is that it should develop a business plan, a product development roadmap, and a market requirements document before launching. This would suggest that the founding entrepreneurs have a prescient and accurate grasp of customers and their desires before they have tried to sell anything. But that is rarely the case.

A technology startup is a *temporary* organization that runs repeated experiments to gauge customer response to a series of MVP introductions. In this way, the startup can pivot from features and benefits that don't fit with customer needs and desires quickly and inexpensively. By way of contrast, if the standard product development pathway is followed prior to engaging customers, the startup might very well expend most of its capital (and also its goodwill with investors) and be unable to pivot or revise features because it has run out of cash. The Mini-Case below illustrates how Motorola made a lucrative pivot during World War II.

MINI-CASE

Motorola Pivots from Radio to Walkie-Talkies

Robert Galvin founded Motorola to build radios for automobiles. For several decades the business was good, but not great. After two decades, Galvin finally had an opportunity to take a vacation. Traveling in Germany in 1936, Galvin was convinced that Hitler was going to start a war. On return, he sent his assistant to an Army camp in Wisconsin to learn how the Army transmitted information in the field. He learned that the prevailing technique was to run a long wire from the front line to the back trenches. This was not only unreliable, but extremely hazardous for those in charge of

running and maintaining the wire. Galvin reasoned, if the company could make radios for automobiles, couldn't it also develop a transmitter to enable two-way wireless communications? As a result of Galvin's hunch that Hitler was going to start a war, his company pivoted to a lucrative and strategically important business model that focused on supplying the U.S. military with the SCR 536, better known as the "walkie-talkie."

Sources: *Csikszentmihalyi, M. 1996. Creativity: Flow and the Psychology of Discovery and Invention. (New York: HarperCollins Publishers.)*

The fundamental purpose of the customer discovery and validation process is to turn guesses about markets, customers, marketing channels, and pricing into facts. Facts cannot be learned by writing a business plan. They can only be learned through direct contact with customers. Robert Galvin's direct contact with the Army led to the walkie-talkie. *Customer discovery* is defined as a process that captures the founders' vision and converts it into a series of hypotheses that can be tested with customers. *Customer validation* is the process of testing whether the evolving business model is repeatable and scalable.

Note that the customer development process illustrated above is circular and iterative. This is in stark contrast to the traditional product development model that moves in a straight line from idea, through design and development, to product launch and sales. Often, as a result of implementing this traditional, linear product development and sales process, startups move forward despite the obvious lack of customer interest. The customer development model, by way of contrast, encourages founders to go back and forth in the product development process based on feedback from customers. In fact, it encourages founders to repeatedly introduce their less-than-perfect product versions to customers and learn something new from each engagement.

Once customer discovery is completed to the founder's satisfaction, the customer validation process should begin. This process focuses on verifying that the emerging business model can be scaled to meet customer demand. During this phase, technology ventures release what are referred to as *high fidelity versions* of their products to test key features with customers. The use of these *test sales* helps the company identify important elements of the business model including:

- The key features that customers prefer
- The existence of a market large enough to be interesting
- The product's perceived value among customers
- Demand for the product
- The *economic buyer* of the product
- Pricing and marketing channel strategies
- The sales cycle and selling process

Each experiment in the customer validation process needs to be designed to address one or more of these key elements of the venture's business model. If technology entrepreneurs complete this process and define each of these elements, they have a better chance of raising the funds necessary to take the company to the next level of growth. In addition, because a repeatable and scalable business model has been verified with customers, the venture's valuation at its initial fundraising will be greater—preserving the founders' equity stakes.

2.5 PILLAR #4: THE BUSINESS MODEL CANVAS

The business model canvas is a new and powerful tool for technology entrepreneurs that was developed by Alexander Osterwalder.[7] A business model is defined as "the logic by which an enterprise sustains itself financially." Put more simply, a business model is "the way the business makes money." It's important for the technology entrepreneur to recognize that business models aren't declared and then executed at the launch of the venture, but instead have to be discovered through interaction with customers. In this way, a business model precedes development of the business plan. Technology entrepreneurs cannot develop a plan of execution until they have discovered a business model that they can execute. The key to an executable business model is that the technology entrepreneur has discovered a *repeatable* and *scalable* system that consistently delivers value to defined customers. By "repeatable" we simply mean that a system can be created that will produce and deliver value to customers on a consistent basis. By "scalable" we mean that the repeatable system can be made to handle enough volume to serve a growing customer base. A good way to begin thinking about the business model for any organization is by asking and answering two fundamental questions:

1. Who is the customer?
2. What does the customer need?

These two questions are really fundamental to either type of enterprise, for-profit or nonprofit. It's clear that these questions apply to profit-seeking ventures, but think about how nonprofits operate. Consider the American Red Cross, for example. The Red Cross has two kinds of customers—people in distress who need direct services, and donors who want to financially support the activities of the Red Cross. Each customer needs something a little different. Those in distress need relief in the way of food and shelter. Donors need to know that the Red Cross is using money wisely and effectively and that people in distress actually are getting the services they need.

To develop a viable business model, the technology entrepreneur—whether starting a for-profit or nonprofit enterprise—must find a way to bring in more cash than is used to create and deliver value to customers. The business model canvas is illustrated in Exhibit 2.4.

The Business Model Canvas

Designed for:

Designed by:

On: Day Month Year

Iteration: No.

Key Partners

Who are our Key Partners?
Who are our key suppliers?
Which Key Resources are we acquiring from partners?
Which Key Activities do partners perform?

MOTIVATIONS FOR PARTNERSHIPS:

Optimization and economy
Reduction of risk and uncertainty
Acquisition of particular resources and activities

Key Activities

What Key Activities do our Value Propositions require?
Our Distribution Channels?
Customer Relationships?
Revenue streams?

CATEGORIES

Production
Problem Solving
Platform/Network

Key Resources

What Key Resources do our Value Propositions require?
Our Distribution Channels? Customer Relationships?
Revenue Streams?

TYPES OF RESOURCES

Physical
Intellectual (brand patents, copyrights, data)
Human
Financial

Value Propositions

What value do we deliver to the customer?
Which one of our customer's problems are we helping to solve?
What bundles of products and services are we offering to each Customer Segment?
Which customer needs are we satisfying?

CHARACTERISTICS

Newness
Performance
Customization
"Getting the Job Done"
Design
Brand/Status
Price
Cost Reduction
Risk Reduction
Accessibility
Convenience/Usability

Customer Relationships

What type of relationship does each of our Customer Segments expect us to establish and maintain with them?
Which ones have we established?
How are they integrated with the rest of our business model?
How costly are they?

EXAMPLES

Personal assistance
Dedicated Personal Assistance
Self-Service
Automated Services
Communities
Co-creation

Channels

Through which Channels do our Customer Segments want to be reached?
How are we reaching them now?
How are our Channels integrated?
Which ones work best?
Which ones are most cost-efficient?
How are we integrating them with customer routines?

CHANNEL PHASES:

1. *Awareness*
   How do we raise awareness about our company's products and services?
2. *Evaluation*
   How do we help customers evaluate our organization's Value Proposition?
3. *Purchase*
   How do we allow customers to purchase specific products and services?
4. *Delivery*
   How do we deliver a Value Proposition to customers?
5. *After sales*
   How do we provide post-purchase customer support?

Customer Segments

For whom are we creating value?
Who are our most important customers?

Mass Market
Niche Market
Segmented
Diversified
Multi-sided Platform

Cost Structure

What are the most important costs inherent in our business model?
Which Key Resources are most expensive?
Which Key Activities are most expensive?

IS YOUR BUSINESS MORE:

Cost Driven (leanest cost structure, low price value proposition, maximum automation, extensive outsourcing)
Value Driven (focused on value creation, premium value proposition)

SAMPLE CHARACTERISTICS:

Fixed Costs (salaries, rents, utilities)
Variable costs
Economies of scale
Economies of scope

Revenue Streams

For what value are our customers really willing to pay?
For what do they currently pay?
How are they currently paying?
How would they prefer to pay?
How much does each Revenue Stream contribute to overall revenues?

TYPES:	FIXED PRICING	DYNAMIC PRICING
Asset sale	*List Price*	*Negotiation(bargaining)*
Usage fee	*Product feature dependent*	*Yield Management*
Subscription Fees	*Customer segment dependent*	*Real-time-Market*
Lending/Renting/Leasing	*Volume dependent*	
Licensing		
Brokerage fees		
Advertising		

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EXHIBIT 2.4

The business model fst.

The business model canvas is divided into nine discrete segments. The technology entrepreneur must address each of the segments of the canvas in order to develop a scalable, repeatable business model, and the canvas provides a handy framework for its development by answering key questions:

Value proposition

- What value do we deliver to customers?
- Which one of our customers' problems are we helping to solve?
- What bundles of products and services are we offering to each customer segment?
- Which customer needs are we satisfying?

Customer relationships

- What type of relationship does each of our customer segments expect us to establish and maintain with them?
- Which relationships have we established?
- How are these relationships integrated with the rest of our business model?
- How costly are these relationships?

Customer segments

- For whom are we creating value?
- Who are our most important customers?

Channels

- Through which channels do our customer segments want to be reached?
- How are we reaching them now?
- How are our channels integrated?
- Which ones work best?
- Which ones are cost-efficient?
- How are we integrating them with customer routines?

Revenue streams

- For what value are our customers willing to pay?
- For what value do they currently pay?
- How are they currently paying?
- How would they prefer to pay?
- How much does each revenue stream contribute to overall revenues?

Cost structure

- What are the most important costs inherent in our business model?
- What key resources are most expensive?
- What key activities are most expensive?

Key partners

- Who are our key partners?
- Who are our key suppliers?
- What key resources are we acquiring from partners?
- What key activities do partners perform?

Key activities

- What key activities do our value propositions require?
- What key activities do our distribution channels require?
- What key activities do our customer relationships require?
- What key activities do our revenue streams require?

Key resources

- What key resources do our value propositions require?
- What key resources do our distribution channels require?
- What key resources do our customer relationships require?
- What key resources do our revenue streams require?

The business model canvas is used by startup technology entrepreneurs in an *iterative* way, meaning that while the startup team addresses each segment of the business model canvas, it may find that other segments need to be adjusted. This iterative process is usually managed in real time by flagging segments with notes using Post-it Notes, describing how that segment will be addressed. As the business model evolves, more flags are placed on top of the old ones. Thus, the top flags represent the latest thinking on how to address that segment of the business model. The notes stacked below the top note represent the historical record of the iterative process. By using this iterative process in each segment of the business model, the technology entrepreneur should eventually find a repeatable, scalable model to use for building and growing the venture.

2.6 PILLAR #5: THE ENTREPRENEURIAL METHOD

Scholars have suggested that expert technology entrepreneurs (and expert entrepreneurs in general) are skilled in what they refer to as the *entrepreneurial method*. This concept is a radical new understanding of entrepreneurship and builds on the concept of the *scientific method* practiced by expert scientists. Think about it for a moment. People can't become expert scientists without having learned how to implement the scientific method in their research, experimentation, and discovery processes. Perhaps it is equally true that people can't become expert technology entrepreneurs without having learned how to implement the entrepreneurial method in their customer discovery and validation processes.

Of course, the question that arises is: "What, exactly, is the scientific method and, incidentally, what is the entrepreneurial method?" Sparing you a long and philosophically obtuse explanation of the scientific method, suffice it to say that scholars have not pinned the definition down precisely, despite centuries of thinking and writing about the topic. In a nutshell, some leading scholars have determined that what makes expert scientists unique is that they have been trained to adhere to certain "principles."[8] Before you get concerned that this is getting too "theoretical," consider that the term "principles" translates to "consistent ways of thinking, behaving, and acting."

For example, one of the hallmarks of an expert scientist is the ability to construct experiments within the context of a specific discipline. Scientists are judged by how well they design and execute experiments, and then interpret and communicate the results of those experiments. That's why it is fairly easy to distinguish expert scientists from crackpots. The crackpot is no less enthusiastic about his or her "discoveries;" but what differentiates the crackpot from the expert is the ability to demonstrate adherence to professionally accepted practices—the principles of designing and executing sound experiments and of communicating results to other scientists.

If there are specific principles that comprise the scientific method, perhaps the same is true of the entrepreneurial method. In fact, there are four principles that have been identified as part of the entrepreneurial method:

2.6.1 Principle #1: Expert Technology Entrepreneurs Believe Value Creation is the Primary Purpose of their Business

Expert technology entrepreneurs have no illusions about the purpose of business. They don't have time to worry about whether the purpose of business is to maximize shareholder wealth, demonstrate "sustainability," or solve social problems. Startup entrepreneurs know that they must create value for other people to generate revenues and profits. And since the startup venture, unlike the large enterprise, must create value from extremely limited resources, the technology entrepreneur is more deeply involved in the actual value creation process than are most corporate managers and leaders. The concept of the "lean startup" aligns well with this principle. The lean startup counsels the entrepreneur to eschew business plan development and focus on bringing the MVP to the market as quickly as possible. According to this perspective, the value creation process is iterative and experimental, relying on customer feedback to discover what the venture should attempt to sell.

2.6.2 Principle #2: Expert Technology Entrepreneurs Rebound Personally and Professionally from Failure

There have been many studies on how entrepreneurs cope with and think about failure.[9] The expert entrepreneur is *resilient*, but that resilience is a result

of a deep-seated belief that failure is acceptable and not a reflection of personal worth or capacity to launch and operate future ventures.[10] Expert entrepreneurs are competitive by nature and are prepared to compete in markets where there are clear winners and clear losers.[11] They are fully able and eager to embrace disruptive innovation that clears the way for new industries and new ventures.[12] And they believe that, as long as something useful was learned, rebounding personally and professionally from failure is a virtue.

2.6.3 Principle #3: Expert Technology Entrepreneurs Respect Private Property and Uphold Contractual Obligations

Expert technology entrepreneurs have respect for private property and contracts. To them, private property comprises the fundamental resources that they can leverage to create value for a market. Technology entrepreneurs understand that they are able to do what they please with private property to which they lay valid claim within the boundaries of common law and regulations pertinent to their industry. Expert entrepreneurs also realize that it is necessary to create contracts they are capable of fulfilling. Expert entrepreneurs act intuitively on the premise that private property needs to be respected and that contracts are to be honored. They regard it as morally virtuous to behave in this manner towards private property and contracts and as unseemly to behave otherwise.

2.6.4 Principle #4: Expert Technology Entrepreneurs Respect the Judgment of the Marketplace

Research into the entrepreneurial method is based in part on interviews conducted with expert technology entrepreneurs. One of the widely cited quotes from this research is "I don't believe in market research. I just go out and sell the stuff."[13] Of course, a single data point is insufficient for drawing general conclusions, but the point aligns with more robust research on entrepreneurial market making.[14] Scholars have investigated entrepreneurial opportunity recognition in great detail. Opportunity recognition is in part concerned with the identification of a market need. The concept of opportunity recognition is based on the assumption that a pre-existing market is somehow "out there" in the entrepreneur's environment waiting to be analyzed for "gaps" in the current offerings. However, it is clear from research on how expert technology entrepreneurs actually bring products to market that it is often the case that these entrepreneurs must act as often to *create* the market as to *exploit* it.[15] The act of *market creation* involves skills, techniques, and metrics that differ markedly from those that are necessary for traditional market analysis and new product launch. Market creation requires the entrepreneur to be skilled at listening, experimenting, gathering feedback, and rapid prototyping. Expert entrepreneurs regard it as a virtue to be willing to abandon deeply held beliefs about what customers want and to listen and respond to their feedback to refine and improve offerings. Expert

entrepreneurs are willing to run numerous experiments with their product and service offerings and to "pivot," if necessary, based on market feedback. Expert entrepreneurs know that "building a better mousetrap" is not guaranteed to motivate customers to "beat a path to their door."

2.7 DELIBERATE PRACTICE

Becoming an expert technology entrepreneur requires practice. It is nice to believe that there is such a thing as a "born entrepreneur," but this is unlikely. In fact, we advocate that anyone can become an entrepreneur given the opportunity to practice the skills that we outline in this book. Some people seem to become entrepreneurs at a younger age than others—and many seem to do so without formally practicing the art of entrepreneurship. However, a closer look typically shows that they had been already exposed to the basic principles of entrepreneurship long before they achieved recognition as an entrepreneur.

Becoming an expert in anything requires practicing, learning, adjusting, and trying again and again. The scholarly literature on what it takes to become an expert has identified a technique called "deliberate practice." Individuals who engage in deliberate practice acquire superior knowledge structures and subsequently develop superior performance. Real expertise exhibits three characteristics: (1) it leads to performance that is consistently superior to that of the expert's peers; (2) it produces concrete results; and (3) it can be replicated and measured.[16] The principles of deliberate practice that you can use to develop your entrepreneurial expertise include:

- *Motivation*: Individuals should be motivated to undertake deliberate practice and develop expertise. Aspiring technology entrepreneurs should tap into whatever motivations are strongest for them, whether it is acquisition of wealth, solving a major social problem, or the sheer enjoyment of starting companies.
- *Understandability*: Rather than studying stories of successful entrepreneurs, which are mostly unique and nonrepeatable, your efforts to develop entrepreneurial expertise should focus on becoming skilled in the entrepreneurial method. The principle of deliberate practice means that you can only practice what you understand. The entrepreneurial method has broken down the tenets of expert entrepreneurship into meaningful and understandable principles. This means that, as an aspiring entrepreneur, you can learn to adhere to the principles to be applied across entrepreneurial domains and in each of the opportunities that you will encounter in your lifetime.
- *Feedback*: For deliberate practice to affect learning, immediate feedback on performance is important. This trial and feedback part of the learning

process is critical as you try new behaviors and modify them in the face of feedback and is used by experts as they continuously upgrade their skills. Look for opportunities to practice new behaviors and understandings, and gather immediate feedback on those performances.

- *Repetition*: Deliberate practice involves repeated performance of the same or similar tasks. The motivation required to repeatedly practice is one of the key distinctions between experts and people who merely have experience. Of course, practicing new behaviors initially can be awkward and uncomfortable. New behaviors usually do not become comfortable until you try them, practice them, and only then determine whether they are making things better for you and your venture.
- *Fit*: This component of deliberate practice asserts that the tasks being practiced must fit the individual and the contextual circumstances. For example, a person who aspires to be a computer game designer must not only have appropriate equipment, but must also be fortunately endowed with appropriate talent. If either is lacking, there would not be a fit between the practice and the goals. Aspiring technology entrepreneurs must learn that success is a function of talent, expertise, environment, and other factors. Expert technology entrepreneurs have either consciously or unconsciously responded effectively to the fundamental question of effectuation: "Given who you are, what you know, and whom you know, what types of economic and/or social artifacts can *you*, would *you* want to, and should *you* create?"[17]

Of course, it might be difficult to find opportunities to "practice" while you are striving mightily to build a company. Recognizing this, expertise scholars have developed a slightly different approach that you can use to develop your skills while you are striving to make your venture successful. This approach has been referred to as "*deliberate performance*."[18] Deliberate performance differs from deliberate practice in that deliberate performance occurs "on the job." Practice typically refers to undertaking simulated performance with the intention of improving performance in the "real world." But opportunities for aspiring entrepreneurs to practice are limited. Many are already to be in the "real world" and need to begin to create results. To remedy this, consider deliberate performance to be your practice routine as you build your venture and become an increasingly adept technology entrepreneur along the way. Many technology entrepreneurs are so-called serial entrepreneurs. That is, they are involved with multiple ventures over time. However, it is rare to find a serial entrepreneur who has not learned valuable lessons and applied them from one venture to the next. If such lessons are not learned, the "serial entrepreneur" had better consider getting a job, because investors aren't interested in entrepreneurs who repeat their mistakes.

2.7.1 When to Start Practicing

There are many opinions about when is the right time to become an entrepreneur. Some believe that entrepreneurship is only for the young. The many technology companies that have been launched by youthful entrepreneurs over the last several decades highlight this perspective. Of course, it is possible that the overweighting towards youth in the technology startups of the last two decades (especially Internet startups) is related partly to the newness of the technologies. Older entrepreneurs simply were not bred on the technologies and don't understand them as well as do youth who have been using and learning the new technologies from a young age. We are now seeing a trend toward second-generation technology entrepreneurs—those who had a successful startup when they were young and are now older and launching their second and third startups.

Being young is helpful when new technologies are rapidly emerging, but even the Internet is now two decades old, and more mature and savvy business models are taking over. Starting at a young age would also be helpful because of the tremendous levels of energy that are normally required to launch new ventures. On the other hand, greater levels of experience among older entrepreneurs can lead to greater efficiencies and less stress and strain.

In reality, there is no single time in life when it is better to launch your entrepreneurial career. In fact, the average age of the first-time entrepreneur is probably older than you think: research has indicated the average age of 39.[19]

Another factor that often concerns aspiring entrepreneurs is the amount of capital they have at their disposal. There is a common misunderstanding that launching a new venture requires large amounts of capital. In reality, the average amount of startup capital in new ventures is $25,000.[20] Expert entrepreneurs have learned that there are many significant ways to keep costs low when launching a new venture and that managing costs is paramount to long-term success. Of course, cost management means making difficult choices—such as forgoing fancy office space in favor of a larger marketing budget.

Another important lesson that expert entrepreneurs learn is that they must surround themselves with other effective people to become successful. A common mistake of aspiring entrepreneurs, by way of contrast, is to go into business with friends or family members *because* they are friends or family members. This more often than not leads to strains in the business and strains in the relationship. We are not saying that you shouldn't go into business with friends or family members, but be certain that you are doing so for the right reason. Anyone—including a friend or family member—whom you decide to align with as a business partner should have the necessary personal capabilities and skills to help the business succeed. Deciding when to launch into your first venture depends in part on the people you are able to recruit to your vision. Technology

entrepreneurship is almost always a team sport. You are well advised to wait until you have recruited the necessary talent and experience to your venture before launching.

Finally, we will stress once again the need to find a good fit between your unique talents and the type of business that you launch. With entrepreneurship on the rise around the world it is becoming increasingly difficult for new entrepreneurs to find and fill a niche. You are far more likely to be successful if you build your business on talents that you possess to a greater extent than the average person. If you are a talented programmer, find a way to build a business around that talent. If you are a talented game designer, build a business around that talent. All of us possess some unique talent that can be leveraged in myriad ways to become successful. Do not launch your venture until you are sure that you are leveraging your greatest talents and strengths. Normally, as people age and mature they develop a keener sense of their unique talents, effectively narrowing the range of potential ventures that they might decide to launch.

2.8 CHAPTER SUMMARY

This chapter introduced you to what we call the "five pillars of technology entrepreneurship." Technology entrepreneurship differs from other types of entrepreneurship because it is generally easier to experiment with and rapidly iterate features and benefits of technologies than it is to do the same with features and benefits of, say, a restaurant. A restaurant entrepreneur generally opens the establishment with his or her full vision already in place. It would be difficult for the restaurant entrepreneur to mimic the customer discovery and validation processes that the technology entrepreneur should embrace. It would also be difficult for the restaurant entrepreneur to follow the precepts of the lean startup. What, for example, would constitute the "minimally viable product" of a restaurant? Certainly a restaurant entrepreneur can experiment with menus, ambience, and other features. But these are usually not introduced and discarded as quickly as features associated with a new technology could be.

As such, it's important for technology entrepreneurs to absorb the lessons of the five pillars discussed in this chapter. This is especially true for technology entrepreneurs who come from nontechnology entrepreneurial backgrounds. We've discussed that following a traditional, linear product development path from idea through sales is fraught with potential dangers for technology entrepreneurs. The dangers lie in the possibility that customers may not be interested in the finished product, and reversing course after a massive investment in product development may not be an option.

In addition to the lean startup and the customer discovery and validation processes, you also learned the importance of value creation and establishing a suitable value proposition. Creating a compelling value proposition is one of

the segments of the business model canvas. The canvas is also an important tool for technology entrepreneurs because the goal of the startup (defined as a "temporary organization") is to discover a scalable, repeatable business model.

Finally, you were introduced to the concept of the "entrepreneurial method." To the extent that entrepreneurial expertise, like scientific expertise, depends on application of a consistent method, it is important to understand what you need to practice to develop such expertise. We've reduced the concept of the entrepreneurial method to a set of specific "principles" that you can practice while honing your own entrepreneurial skills. The principles center on value creation, respect for private property, resilience in the event of failure, and respect for the judgment of the marketplace. You can practice these via the processes of deliberate practice or deliberate performance, as we elaborated.

There is no time like the present to begin to develop the principles of the entrepreneurial method on your journey to becoming an expert technology entrepreneur. The challenge is to begin; the journey itself will be your reward.

KEYTERMS

Deliberate practice A technique for becoming expert in nearly any field.
Value proposition What a venture tells its customers about the value it provides to them.
Minimal viable product A nascent product that is presented to customers to gather feedback.
Pivot or persevere A move away from the current business model to a revised one; persevering connotes continuation with the current business model.
Temporary organization A startup with the goal to discover a business model; once that is done, execution and growth are paramount.
Customer discovery The process of converting the founders' vision into hypotheses that can be tested with potential customers.
Customer validation After customer discovery, the process of validating a scalable, repeatable business model.
High fidelity versions Products that have been refined iteratively through customer discovery and are now used in the customer validation process.
Test sales The activity of introducing the high-fidelity version of the product to customers to gauge their responses to the venture's sales approach and value proposition.
Economic buyer The person who finally decides whether to purchase a product.
Scalable business model A business model that can be grown to meet increasing customer volume.
Repeatable business model A business model around which a system can be built that delivers consistent value to customers.
Iterative The need to repeatedly address a problem until a suitable solution has been developed.
Entrepreneurial method It is thought that expert entrepreneurs practice a method similar to the way scientists practice the scientific method.
Market creation The entrepreneur who has a core competency, or develops a product, and then looks for applications of or creates a need or want in the marketplace.
Deliberate performance Practicing the techniques of deliberate practice while "on the job."

ADDITIONAL READING

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Ries E. 2011. The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses. Crown Business, New York.

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WEB RESOURCES

http://www.businessmodelgeneration.com/: This is the website for the business model canvas and contains other useful tools for technology entrepreneurs.

http://ecorner.stanford.edu/authorMaterialInfo.html?mid=1465: This link is to Stanford's "ecorner," which hosts a wide range of resources for technology entrepreneurs. This particular link takes you to some helpful videos on the process of value creation.

http://www.iwanamaker.com/: This is the website of the company discussed in the short vignette at the beginning of this chapter. You may want to check in to see how the venture is faring.

ENDNOTES

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