

IEEE-USA EBOOKS PRESENTS

STRATEGIC THINKING

A HIGH-TECH STRATEGY GUIDEBOOK

By Jim Blakley

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Table of Contents

Introduction	6
What is Strategy?.....	8
Getting the Map: Analysis	11
Understanding Your Place in the World — Tools for Industry and Company Analysis	12
Five Forces.....	12
Extending Porter: the ValueNet and the Business Ecosystem.....	17
The Value Chain	19
Horizontal vs. Vertical Industry Structure	21
Application Notes — Industry Analysis.....	23
Technology Adoption.....	24
What does the S-Curve Mean to You?.....	24
What Stands in Your Way? Barriers to Technology Adoption	25
Gartner’s Hype Cycle	26
What makes an Innovation Practical?	28
The Adoption Life Cycle	29
But What if It’s Really New? The Chasm and Disruption.....	30
Disruption	36
The Tipping Point	39
Increasing Returns to Scale and the Learning Curve	40
Application Notes — Technology Adoption	40
Completing the Analysis	44
Planning the Trip: Synthesis	45
What’s the Destination, Anyway? Scenario Planning	45
Forming the Team	47
Baselining.....	48
Deciding What’s Important.....	49
Creating the Scenarios	50
Narrowing and Describing.....	51
Implications for the Company	52
Action Planning	52
Follow-up	54
Who’s Your Financier?	54
Financing in Large Companies	55
Financing in Small Companies	57
What Do You Want to Be When You Get There? Business Models	60
Porter’s Competitive Strategy Models	60
Revenues, Expenses and Strategy.....	62

Product Strategy	65
What Route to Take? Options Analysis.....	67
Loading the Car — Strategy Ratification.....	69
Making the Trip — Action	70
Tools for Implementation	70
People.....	70
Money.....	71
Structure.....	72
Process	73
Systems.....	75
Objectives and Measures	76
External Partnerships and Relationships	77
Incentives	79
Pulling It Together.....	80
Timing is Everything	83
Summary.....	84
Bibliography and Further Information	85

Figures

Figure 1.	Strategy vs. Tactics	10
Figure 2.	Porter's Five Forces Model	13
Figure 3.	Market Concentration	14
Figure 4.	The ValueNet Model	18
Figure 5.	Business Ecosystems	19
Figure 6.	ASIC Value Chain Example	21
Figure 7.	Vertical to Horizontal Transformation	22
Figure 8.	Example S-Curves	25
Figure 9.	Gartner's Hype Cycle	27
Figure 10.	The Adoption Life Cycle	29
Figure 11.	Discovering the Chasm	32
Figure 12.	Adoption, Applications, Customers	36
Figure 13.	The Innovator's Dilemma	38
Figure 14.	Scenario Planning Process	47
Figure 15.	Typical Scenario Planning Agenda	48
Figure 16.	IP Video Key Factors Brainstorm	50
Figure 17.	IP Video Action Plan	53
Figure 18.	Venture Financeability	59
Figure 19.	Porter's Competitive Strategies	61
Figure 20.	Business Models	64
Figure 21.	The Whole Product	66
Figure 22.	BCG Portfolio Management Model	67

Introduction

Mega-mall bookstores and airport newsstands are filled with popular books on business strategy. Academic journals provide a long narrative on the evolution of strategic theory in business. Yet, every day, technology companies fail from poor strategy or poor strategy execution. Size doesn't matter. The brilliance of the executive team doesn't matter; nor do past successes. Not even good press matters. The cause of many of these failures can be seen between the lines of countless *Dilbert* strips. It can be heard in the lunchrooms and cube farms of large and small companies. Over and over, the conversation among the people who must implement "the strategy" is a near vehement rejection of the attempts of executive management to lead the organization in a new direction. Six months after the new vision has been unveiled, executives stumble back to the board room wondering why they haven't made progress toward their seemingly crystal clear vision. The answer can be summed up in that famous line from *Cool Hand Luke*: "What we have here is a failure to communicate."

When the executive staff begins to roll out new strategy in countless training sessions, open forums and email blasts, they are careful to assure that the marketing, sales, engineering, finance and operations staffs are in a receptive mood for change — by describing a brewing crisis or showing a glowing world of opportunity ahead. They create a simple vision for where they want the business to go. They provide plenty of data on what must change to achieve that bright vision. They ask for commitment from the staff toward the new strategy. They pause and ask for questions from the audience — waiting with open body language while the sycophants ask the easy questions, the brave and reckless throw the hardballs, and the earnest but disconnected ask: "*But, what about me and my department?*" Transcripts of the sessions and Power Point presentations are posted on intranet sites afterwards, and then everyone returns to their day-to-day routines. The executive staff goes back confident that everyone is aligned and actively engaged in helping to achieve the new "vision," or at worst, understands but disagrees with the strategy.

However, the executives missed a fundamental step long before the strategy launch started. Imagine arriving in Tokyo for the first time, not speaking Japanese and trying to find your hotel. You approach a friendly looking Japanese woman; show her the card you were given with the address of your hotel; and look at her with a questioning expression on your face. She looks at the card, smiles, and then begins speaking and gesticulating rapidly — in a way that is totally incomprehensible to you. You listen politely for awhile; nod to express your thanks; then make a beeline for the taxi queue — hopeful that the driver will just take you to the hotel. What went wrong? For this transaction to succeed, you would need to know Japanese, or your accommodating but ineffective guide would need to know your native language. Without these communication tools, you're shouldn't be surprised when you are unable to follow her "strategy" for reaching the hotel.

The breakdown in strategy implementation arises from the same communication gap. Executive staff is trained in the language and tools of strategy. The seminars, conferences, executive MBA programs and reading focus at about a C level create vocabulary, syntax and cultural reference points for strategic thinking and dialogue. But, the engineering staff is trained in engineering practices and technology trends. The sales staff is trained in sales techniques, market trends, and product changes. The opera-

tions staff learns process management and manufacturing tools. The marketing staff learns new ways to define products, pricing, promotion and distribution. First and second line managers learn team formation, objective setting, project management and other managerial tools. Is it any wonder the executive staff and the rest of the staff can't communicate about strategy?

This book is about providing those unfamiliar with the language and process of strategy with the basic tools needed to understand and implement it. It intends to provide an accessible guide to strategy for non-strategists in high-technology companies. It may also provide enough guidance to set non-strategists on the road to becoming effective strategists. It likely won't improve the strategy formation process for experienced strategists; however, "non-strategist" is a misnomer. In their own ways, everyone is part of both strategy formation and strategy implementation — just as our traveler to Japan is highly dependent on strategy, and will often be required to take initiative and make strategic judgment calls.

Reading this book, though, won't make you fluent in strategic thinking. It is a crash course in strategy. It will give you some basic tools and point you toward some of the critical guides to strategy in high technology. The goal is not to provide you with answers to what good strategy looks like, but rather to show the processes and frameworks that enable strategists to create and implement good strategy.

This book is structured into three sections that reflect the steps of the strategy process:

- **Analysis.** Every good strategist spends much strategy time in analysis. During the analysis phase, a strategist collects data; selects analytic models; and merges models and data to produce a view of the current state of the industry, company and market. When teams create strategy, this phase is full of debate as worldviews, experience, day-to-day focus and beliefs collide.
- **Synthesis.** Once strategists have a clear view of today's world, they must produce some beliefs about what the future will look like based on today's trends. From this view, strategists begin to make choices of what they want their business to be in that timeframe. In this phase, often given short shrift during the process, they make key decisions that will chart the future course of a company.
- **Action.** Strategy without action is pointless. In this phase, the company implements the strategy. Implementing strategy requires several clear actions to take place. The rest of the company must be educated, changes in organizational activities must be made and measures must be put in place to determine, over time, whether the strategy is working.

Although this book is targeted at casual strategists and strategy consumers, I have written it as a "how-to" for strategy teams. This perspective is intended to help casual strategists participate or even drive strategy development, and to help strategy consumers understand how good strategy is developed.

— Jim Blakley

What is Strategy?

The word strategy comes from the Greek word for *generalship*, revealing its military origins. It came to be applied to business endeavors during the rise of scientific management in the twentieth century. Since then, business writers and academics have produced a large body of work on the topic. They don't all use the word *strategy* to mean the same thing. While it isn't critical that we have a precise definition of the word to understand the process, having a working description and an understanding of how people from different backgrounds perceive strategy is useful.

Depending on roles and backgrounds, individual business strategy creators and consumers will have different concepts about good strategy. While no one can precisely articulate the definition of strategy ("*I can't tell you what it looks like, but I'll know it when I see it*"), many people have an intuitive sense of what they mean when they say "*strategy*." Generalities are dangerous, but people often use general mental models to describe strategy. These views are usually aligned with an individual's function and training.

Executive Staff

Including the CEO, an executive staff usually comes from some functional discipline like engineering, marketing, finance, legal, or sales. Usually, they have received years of training in management, business degree programs and reading to develop a vocabulary for strategy. CEOs and their staffs tend to approach strategy in one of two ways: intuitive, experiential-based, strategic decision-making¹ or analytical, tool-based strategic thinking. This book focuses on the latter approach. Even in the case where the more formal tools are used, often the form of the output (diagrams, graphs and words used in the strategy rollout sessions) are not prescribed, and the strategy's logic may be lost on the broader audience. In the intuitive case, logic is very difficult to communicate, and it often leaves its recipients scratching their heads.

Research and Development (R&D) Staff

Coming from a more analytic, scientific and structured working environment, an R&D staff often has a more structured concept of good strategy. For an engineer, strategy means having a clear description of the current world; a well articulated view of the future; and a flowchart-like strategic decision tree that shows a path to the future resulting in both technical product perfection and financial success. This staff will support each step along the strategy analysis with empirical data collected from real customers, suppliers and the company's own data warehouse. It derives data and assertions from industry analysts, or worse, the company's own incompetent marketing department. This idealistic model is impossible to achieve in a real world dominated by ambiguity, information gaps and the unpredictable actions of other market players. So, engineers are destined to be disappointed and cynical about corporate strategy. Nonetheless, the R&D paradigm for strategy formation is a standard worth striving for.

1 *Intuition* has had a recent *moment in the sun* as a tool for strategy creation. (See [32], EMR article).

Sales Staff

A sales staff often has short-term focus on sales, revenue and customer satisfaction, and a more simplistic view of strategy. Salespeople are always thinking about how strategy will have an impact on the products available to sell. They constantly filter strategy through both relevance to their customers, and their customers' likely objections to the strategy. Constantly seeking to become the "thought leader" to their customers [37], salespeople are also anxious about having an easily consumable strategy presentation — even though in the early phases of strategy implementation, presenting the strategy to customers may do more harm than good.²

Financial Staff

Analytically oriented like the engineering staff, the financial staff usually cares less about the actual business strategy itself, and spends more energy on assuring that the *numbers look right*. Is the strategy backed by realistic revenue and cost data? Does the net present value (or whatever current measure finance uses to assess opportunities) meet the controller's requirements? Senior finance staffs often will attempt to validate the assumptions behind the strategy, either through their own experience, or through the opinions of trusted engineering, sales and marketing people.

Operations Staff

While clearly having a deep understanding of the everyday successes and failures of the business, an operations staff (manufacturing, customer service, etc.) is usually not as directly in touch with the larger business and technology issues that drive strategy decisions. They will tend to look to executive staff leadership abilities, and will accept a well-reasoned and compelling strategy, as long as it does not diverge too much from their perception of the organization's ability to fulfill the vision.

With this diversity of world views (and, of course, some far less constructive, world views than these inherently open-minded ones), it's no surprise that new strategies are often met with resistance or incomprehension. Again, these characterizations are broad and, within any organization, no two people — even those with similar roles and backgrounds — will have the same reactions and opinions.

In this book, we'll adopt a relatively simple but structured view of what a good strategy looks like:

- **A well-formed, central strategic question** — For example, how do we expand our revenue growth from five percent to 10 percent? How do we respond to market entry by a new, large player? How do we best capitalize on a new technology discovered by our research labs?
- **A clear view of the current situation** — What is our position relative to our competitors, customers and suppliers? What are the current trends happening in our market? What are our capabilities and our weaknesses?

² In a corollary to the "Osborne Effect," pre-announcing a new strategy to a customer can lead them to believe that the company is moving down a new track that may or may not align with the needs of that customer.

- **A perspective on the timeframe for actions and results** — Do we need to respond this year? Will we see any results within three years?
- **A compelling vision for the world as it will look when we succeed** — A sense of the steps that it will take to get to that vision and the risks that face us.
- **A definitive set of actions that will be taken** within the next month to begin implementing the strategy.
- **A set of measures and indicators** that will give us a sense of whether our strategy is working as time passes.

If the strategy consumers held strategy suppliers to these standards, strategy formation and implementation would improve dramatically.

A brief word about strategy versus tactics: the pressure of day-to-day issues tends to cause organizations to spend insufficient time on strategy. All time is spent in tactical firefighting and responding to opportunities. Over time, leaders recognize that this approach will not sustain the business, and they begin to set aside “strategy time,” much as parents set aside “quiet time” for their kids. This time can take the form of strategy retreats, strategy committees and task forces, and strategy sessions at staff meetings. At the next stage of the organization’s development, strategy is not separated from day-to-day operations, tactics are undertaken in the context of strategies, and strategies are refined as new information becomes available from results. Time for reflection and discussion still needs to be set aside to absorb results, measure progress, and revisit big issues — but strategy reformation should not be necessary. As the philosopher John Locke asserted, the well-rounded individual spends time in both action and in reflection. Figure 1 gives a quick reference for some of the differences between strategy and tactics.

	Strategic	Tactical
Time Horizon	Longer Term	Shorter Term
Question	“What to Do”	“How to Do it”
Purpose	Set Direction	Align and Execute to the Set Direction
Challenge	Structure the Unstructured	Sequence Critical Events and Detail
Result	Articulates a Direction, Priorities & Boundary Conditions	Defines an Execution Path that Aligns to the Strategy

Figure 1. Strategy vs. Tactics

But, strategy and tactics separated by hard role boundaries, organizational boundaries and communication boundaries become disconnected over time. Most successful organizations don’t build a solid wall between the two.

Getting the Map: Analysis

Leaving on a long journey without first getting a map would be a mistake that could leave you hopelessly lost. In strategy formation, creating the map is the first step. An analysis focused on understanding the industry in which the company operates, the company's basic value within that industry, and the evolution of technology relevant to the company provides the baseline for planning the company's future actions. Industries change; boundaries between industries blur; and the status of individual companies in industries shift as their fortunes rise and fall. So, the analysis step must be periodically rerun. Some companies conduct the rerun annually. Others do it every time they need to address a new strategic question. Unfortunately, some companies never do it. And because analysis is the main focus of strategy books and MBA programs, many strategic plans progress little further than analysis. Since analytic minds find this stage interesting and comforting, strategists can spend much time in this step. But worthy analysis must progress to synthesis and action.

Prior to starting analysis, an organization must frame the central question that the strategic exercise will address. Occasionally, the central question can emerge, vampire-like, from the analysis itself. However, it's a little frightening to think that an organization could be so disconnected from its environment that it could not articulate the important questions it faces without deep analysis. Some example central questions:

"Sales have dropped five percent over the past year. Previously, we were growing at a rate of 20 percent-per-year. What's going on and what do we do about it?"

"Our original customers for Product X are very satisfied and continue to buy. But, our sales team can't seem to find any new customers. Why? And what can we do?"

"The Board is telling us to continue on a high-growth path. The only way we can do that is by going into new markets and new technologies. Which ones look attractive? Which ones could we really do something about?"

"The guys in research have developed an amazing new technology. We're not sure how it will impact our business. Are there any opportunities for it? Does it represent any risks to our current business?"

Central questions should be pretty specific and "answerable." That is, such questions should make it possible to finish the strategy process with a clear set of actions. Some unanswerable strategy questions:

"What's happening in our industry, and what should we do about it?" This question is so open-ended that it can't be answered.

"Which competitors should we worry about?" This question is both open-ended and can have no actionable result.

It's possible to have more than one strategic question for a given strategic exercise. However, a better approach is to have a single, central question, with multiple issues to be considered under that ques-

tion. That approach allows for a common thread and a focus to the discussions.

Once the strategy team has framed the central strategic question, it's time to set it aside temporarily and get a handle on the organization's environment.

The first step is to take a mental snapshot of the world around the company, and the fundamental influences on its competitors, suppliers, customers and itself. This phase of analysis is static — fixed in time. After this phase, we'll move into looking at what's likely to happen in the firm's industry in the future.

Understanding Your Place in the World — Tools for Industry and Company Analysis

Five Forces

The most basic first step in strategy formation is developing a clear understanding of the industry in which the company³ plays. One of the earliest and most common, straightforward tools to apply is Michael Porter's Five Forces model (Figure 1 and Figure 2). This model allows the strategy team to have a structured discussion of:

- **Competitors** — Who are our “real” competitors? How do we compete with them? What are the relative positions of each of the competitors?
- **Buyers** — Who are the customers for our products? Why do they buy our product rather than our competitor's product? Do they have other alternatives to buying our product? Is our product truly important to them? How much power do they have over us?
- **Suppliers** — Do we have any suppliers who are critical to our success? What is our relationship with them? How vulnerable are we to the fortunes of our suppliers?
- **New Entrants** — Are there any other companies who appear to be poised to enter our industry? How will we and the industry respond to entry by those players?
- **Substitutes** — Are there any other ways for our customers to solve the problem that they use our product for? Is that alternative better or worse than our alternative? Does it have the potential to be good enough, or as good as our product? (More about this strategy later, when we discuss *disruptive innovation*.)

3 For the rest of this document, we'll use the word *company* to refer to the organization that is performing the strategy exercise. Depending on the situation, the company could, in fact, be a division or department within a larger company. There's also no fundamental reason why these same tools cannot also be used by institutions in the non-profit sector.

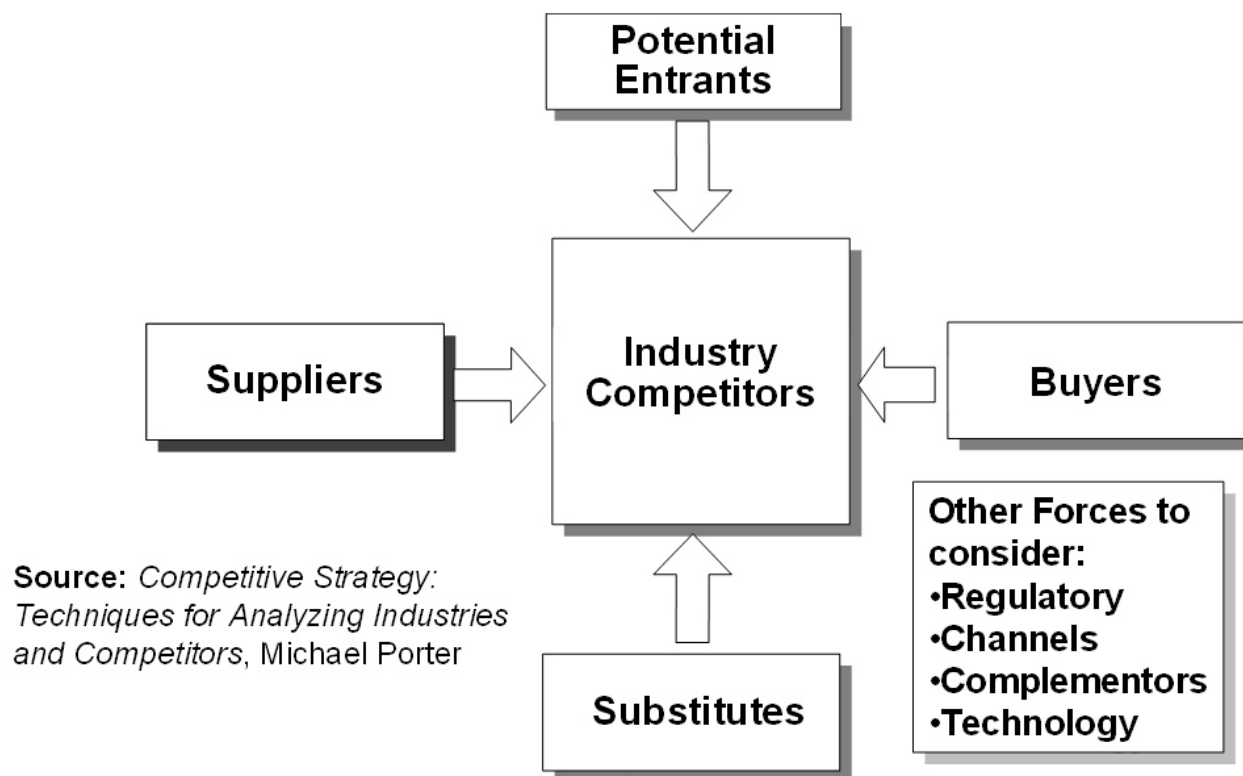


Figure 2. Porter’s Five Forces Model

These five forces are generic across industries, even though the significance of each may vary from one industry to another. In different industries, other forces may be highly important. In practice, the strategy team should feel free to add those industry-specific forces to its analysis. Examples of other forces that may be important:

- **Regulation** — Government bodies and their processes, political influence and relationships may be important. For example, in the U.S. telecommunications industry, the relationship between service providers, the Federal Communications Commission, and the state public utility commissions has a major impact on the investment decisions made.
- **Channels** — The route that products take to the customer can be critically important for those companies that don’t deliver their products directly to their customer. For example, most small companies must use distributors or agents to have any hope of reaching their customers. In another example, a large company with a direct sales model may have a significant price advantage over a smaller company that must use distributors.
- **Complementors** — Makers of other products that are used with the company’s products may play a substantial role. For example, Microsoft plays an important role in the microprocessor industry — even though, for the most part, it is not a direct purchaser of the chips that its products run on.
- **Technology** — While not really a specific industry player, technology can be a driving force

behind an industry. Standards, access to specific technologies, or knowledge and intellectual property ownership can play a significant role in industry structure. For example, the standardization and adoption of Internet protocols, and subsequent web protocols like HTML, were a fundamental catalyst behind the Internet explosion of the late 1990s. It allowed Cisco to become a 22 billion-dollar company. Qualcomm's ownership of key wireless intellectual property became the basis for its business model.

The analysis team should be as objective as possible. It's very easy to believe your own press, and attribute either greater strength or weakness to your competitors than is the reality. Scope the analysis to reflect the central strategy question. If the question is related to a specific product line, then reflect it in the forces analysis. If the question is about what is happening to customers, then the most value may come from analyzing from the customers' perspectives, rather than from the company itself (i.e., put your company in the supplier box). While simply discussing and agreeing on the various players and their respective roles and importance in the industry has enormous value, look for some more specific things during the analysis. Per Porter [1]:

How Intense Is the Competition between Firms?

Different industries will have different levels of competitive intensity.

- Is the market highly concentrated? Do a handful of companies control most of the market share? (See Figure 3). A highly concentrated market is often defined as one where the top five market players make up more than 50 percent of the overall market.

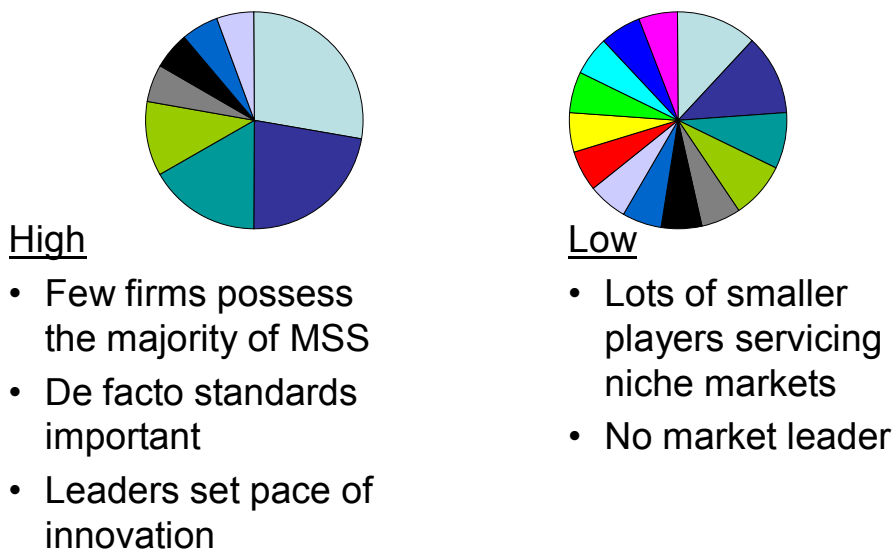


Figure 3. Market Concentration

- **How fast is the industry growing?** In a high-growth industry, competition is often less intense than in more mature industries where the market share stakes are higher. However, in the brand

new markets common in technology, competition can be very intense — as the players are establishing their claims much like prospectors in a gold rush.

- **Do the competitors have high fixed costs?** When they do, they are highly motivated to cut prices in times of slow demand to keep the factories full.
- **Are the products very similar?** The more similar the products, the more likely the industry will be highly competitive. Companies will fight hard to keep their customers, if it's easy for the customers to move from one product to another. U.S. long distance phone business succumbed to this problem – switching between carriers became so easy, and the products were so undifferentiated, that AT&T, MCI and Sprint competed until they were almost out of business.
- **Are the companies very similar?** If they have differing strategies, they may compete in confusing and conflicting ways. For example, a core business for a small company may be a way of filling excess capacity for a large company. Similar companies often see the market similarly, and will compete in a way that avoids disrupting the status quo.
- **How strategic is the opportunity to the firms in the industry?** For example, a company looking to establish a position in China is likely to compete aggressively for specific deals in that country.
- **How hard is it to leave the industry?** Companies with deep commitments to customers, much invested in special equipment or knowledge, or with regulatory and legal requirements to stay, are not likely to leave the industry. Even if they are losing money — excess capacity means more intense competition.

Can New Players Enter?

- Are there barriers to entry?
 - Are there scale barriers? Do bigger suppliers have an inherent advantage?
 - Is there product differentiation? Do buyers select products based on features, performance, brand, or supplier reputation? Or do they select mostly on price?
 - How much investment is required to enter the market? Will entrants need to build large factories, or conduct a large R&D effort?
 - How hard is it for current product users to switch from one product to another? In software businesses, switching costs are often high — as customers must retrain developers, administrators and users to switch.
 - How hard is it for entrants to reach the customers? Will they have access to distribution channels?
 - Do incumbents have cost advantages that entrants won't? Are there specific patents, government subsidies and geographic locations, sources of supply or experience that the incumbents have that entrants will not?
 - Are there government policies that favor incumbents? Do domestic producers have an advantage over importers? Are franchises or licenses required?

- Will existing competitors respond aggressively to new entrants by lowering price or taking other action? Have they responded previously to entry this way?
- Is the prevailing price for products too low for entry to be a viable option? (In Porter, the “entry deterring price”).

Note: Not all potential entrants are equal. A new entrant in an adjacent market, with similar technical capabilities, or an existing distribution, may not face large entry barriers.

Are Substitutes Available?

Discussion of substitutes often becomes very heated during an application of Porter. We’ll revisit this area when we discuss *disruptive technologies*. At times, substitutes are relatively straightforward. For example, downloading songs from iTunes is a substitute for purchasing the CD for those same songs. Here, the debate is often whether the substitute should be included as an existing competitor in the market, rather than as a substitute. This argument is usually pedantic and should be avoided. It gets in the way of discussing real issues. You should also be aware of mundane substitutes. Watching a movie is a substitute for listening to music. In the cinema business, this discussion is crucial. In a technology industry, it probably is not. The most interesting substitutes in technology are those that have the potential to ultimately replace the industry’s product. If during the analysis, you find people saying things like, “*Oh, that product isn’t good enough to be a substitute for ours;*” watch out! The history of technology is littered with examples of this unfortunate thinking. Western Union said it about the telephone. DEC, Prime, Data General and even IBM said it about the PC. Novell, IBM and others said it about Internet protocol switches.

How Powerful Are Customers?

Customers are the reason for a company to exist — but the relative power of customers over its suppliers has a large influence over company actions in an industry.

- *Are customers highly concentrated?* Or do they buy large proportions of a supplier’s volume? If too few customers account for a large part of the supplier’s market, then the supplier can be at the mercy of customers.
- *Is the supplier’s product very important to the customer?* Either because the customer buys a large quantity, or because it is a critical component of the customer’s business? If so, then the customer will spend substantial time and energy working with the supplier to assure that quality and price meet its needs.
- *Are the products standardized and undifferentiated?* Are purchases relationship-based or transactional? If the customer can easily switch between products from different suppliers, then the customer has relatively more power.
- *How profitable is the customer’s business?* If the business is struggling, then the customer is likely to push suppliers for better terms.
- *Can the customer make the product themselves?* In the increasingly common OEM business mod-

el⁴, the choice of whether to make the product internally or outsource is a constant question.

- *How much does the customer know about the product and the market for that product?* Very sophisticated and knowledgeable customers with access to good information can exert a large influence over the supplier.

How Powerful Are Suppliers?

Supplier power is, of course, the flip side of customer power. Supplier concentration, product differentiation, relative importance of supplier to customer and customer to supplier and the threat of moving up the product integration stack all have an impact on supplier power.

Companies must also think of their employees as suppliers in this analysis. Particularly in technology domains, where the value of knowledge and experience is central, employees (especially key technical employees) can have large influence over the company.

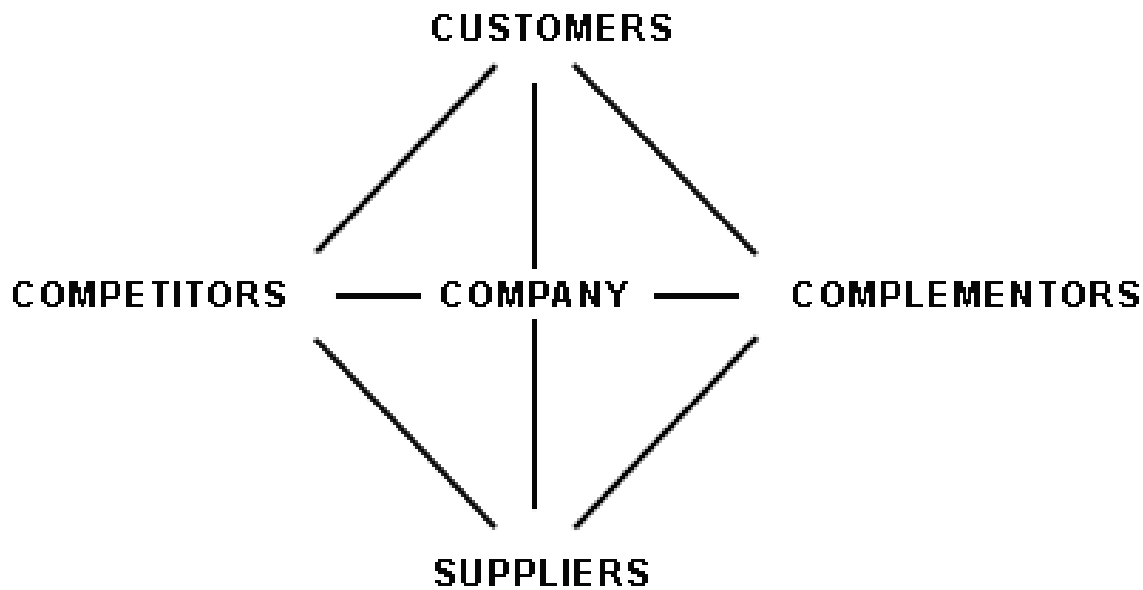
Porter's Forces Model is the seminal, ground breaking work for industry analysis. Its simplicity and clarity make it extremely useful as a tool. A strategy team values nothing more than to spend half a day jointly creating a Forces-based snapshot of the company's industry. However, its simplicity is also its weakness. It tends to make analysts draw very sharp and arbitrary classifications of companies. In the following sections, we'll look at some alternatives that have expanded on Porter's model to make other more complex and flexible models.

Extending Porter: ValueNet and the Business Ecosystem

In the real, messy world of technology (and many other industries), the well defined roles between customers, suppliers, competitors, complementors, governments and other players simply do not exist. It is very common for a large company to have a division that competes directly with the major customer of another division. Lucent Technologies' spin off from AT&T was precipitated, because clearly Lucent's primary customer base, the U.S. local exchange carriers [18] viewed AT&T as a serious competitor. Complementary relationships can also play a much more significant role in industries than can be easily captured in Porter's simple Forces analysis. Microsoft purchases almost nothing directly from Intel, yet the relationship between the two is one of the most fundamental in the computer industry.

Several models have been developed to reflect this greater complexity. The simplest is Brandenburger and Nalebuff's [4] ValueNet model, shown in Figure 4. This model extends Porter's Forces model to consider some of the interdependencies between market players.

4 Original Equipment Business. In this model, the supplier produces a product that is modified or bundled into another product for delivery to a customer.

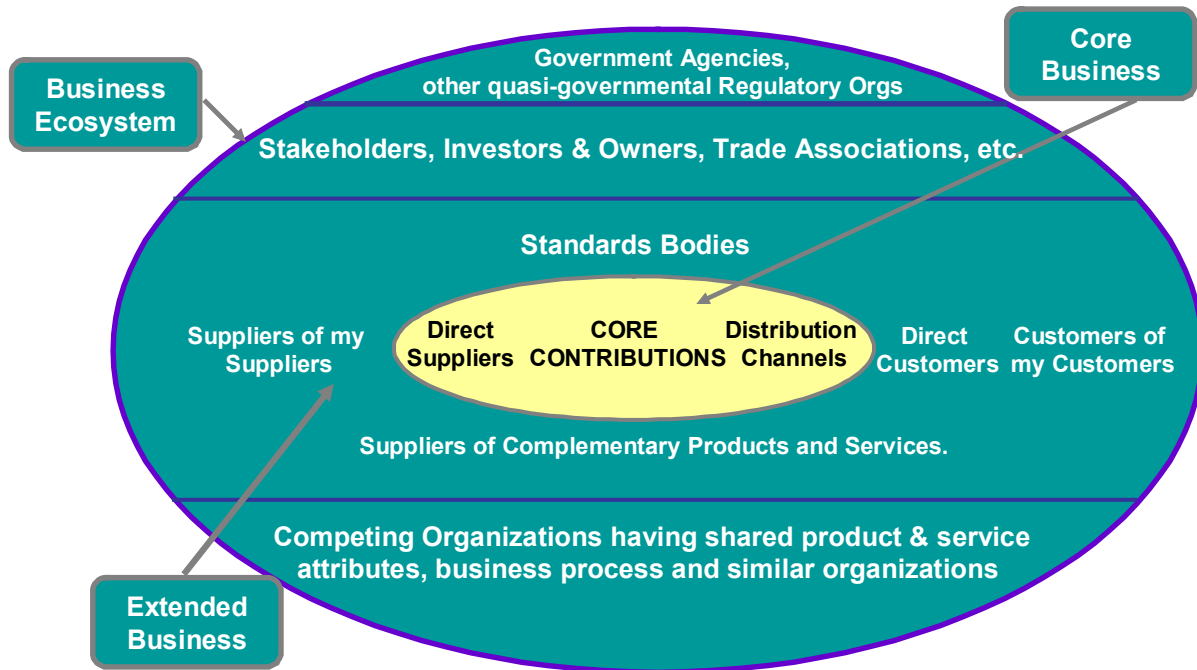


Source: *Co-opetition* by Adam Brandenburger and Barry Nalebuff

Figure 4. The ValueNet Model

James Moore [3] observed that industries operate similarly to ecological ecosystems. He developed a very sophisticated model for business ecosystems that makes the compelling case that the interdependency of industry players is as complex as can be seen in nature. The unforeseen consequences of actions taken by one player can have dramatic impact on the ultimate structure of an industry. The exit of one large company can lead to the downfall of smaller companies that make complementary products. These collapses can lead to an overall weakening of the industry as capital markets begin pulling out funding for other companies in that industry. Other companies may leave for greener pastures and thereby impact the ecosystems of their destination industries. According to Moore, these types of events mimic the dynamics that occur in biological ecosystems.

Both the ValueNet Model and the Business Ecosystem Model represent excellent tools for a deeper understanding of industry structure. Because of both models' complexity and ambiguity, each is somewhat difficult to use in strategy team applications. However, having a strategy team member produce a Business Ecosystem mapping (as shown in Figure 5), and bringing it to the team for review, can be a useful exercise.



Source: Moore, James F., *The Death of Competition: Leadership & Strategy in the Age of Business Ecosystems*

Figure 5. Business Ecosystems

Now, let's move onto some other key concepts required for understanding industry and company structure.

The Value Chain

The aphorism, "Where there is mystery, there is margin" is the essence of the somewhat obscure "Value Chain" concept. Extending the saying to, "Where there is investment, there is income" generalizes the concept to include financial and production value, as well as knowledge and skill value. First introduced by Porter [2], the value chain captures the concept that the price paid for a product is really the sum of all the raw materials (including human knowledge and energy), plus the value-added activities performed as the raw materials are acquired and transformed into the end product. As each activity is performed, it adds margin — and hopefully profit — to the one performing the activity. It also increases the price of the end product.

Value Chain Analysis is mechanism for looking at the process of developing and delivering a product

to market and assigning price, margin and costs to each step in the process. While end-to-end, detailed value chain analysis is rarely done, it can be a useful tool for comparing the distribution and procurement processes for different companies. It is also a very important step in developing new companies and introducing significantly new products into existing companies. The value chain can be divided into to three main components, mirroring the Porter Forces diagram: the *supply chain*, the *internal value chain*, and the *fulfillment chain*. The supply chain has to do with the company's relationship with all its suppliers of product ingredients. The activities the company undertakes itself are considered the internal value chain. And the fulfillment chain is the path of the product to the end-user. The three components can be analyzed separately although they sometimes have inter-relationships, dependencies and conflicts that must be reconciled.

As a fulfillment chain example: Suppose you work for a small ASIC company.⁵ Your company's existing internal value chain is based on a small, direct sales team selling to large OEMs. You typically receive product margins of 70 percent. Given your R&D costs, you need to ship 10,000 units within the first three years of product life to make money. An electronic components distributor is the first step in the fulfillment chain. Your distributor typically receives a 10 percent margin for inventory, credit, design, win, support, and after-sale support. Your sales team and primary distributors are focused on large U.S.-based OEMs; therefore, you typically win these designs. The OEM does system design and writes all the software, but typically manufactures its systems in Taiwan, using contract manufacturers. The OEM expects that your distributors will stock components in Taiwan and be capable of providing additional supply within 48 hours, should there be a rush order. Let's assume that your component constitutes 20 percent of the overall system component costs, and that the contract manufacturer's cost for procurement, printed circuit manufacture, assembly and test is \$50.

The contract manufacturer adds a 20 percent margin to the cost of the system at the shipment port.⁶ The OEM adds an additional 30 percent to the FOB price, and it gets another 20 percent for the added software's value. The software has a margin of 90 percent. The fulfillment chain involves putting the finished system product into a value-added reseller (VAR) channel. The VAR channel then adds an additional 20 percent to the product before delivering it to the end user. Typically, the VAR gets an additional 75 percent in services revenue sold as a complement to the product sale. The VAR makes a 35 percent margin on services. If we ignore transaction costs like shipping and export duties, the value chain looks like Figure 6.

5 Application Specific Integrated Circuit

6 Terms of delivery are captured under the ICC established "Incoterms". <http://www.iccwbo.org/>. Typically, they are quoted as "Free on Board" or "FOB" meaning the price for the manufacturer to deliver the product on-board the ship at the point of origin.

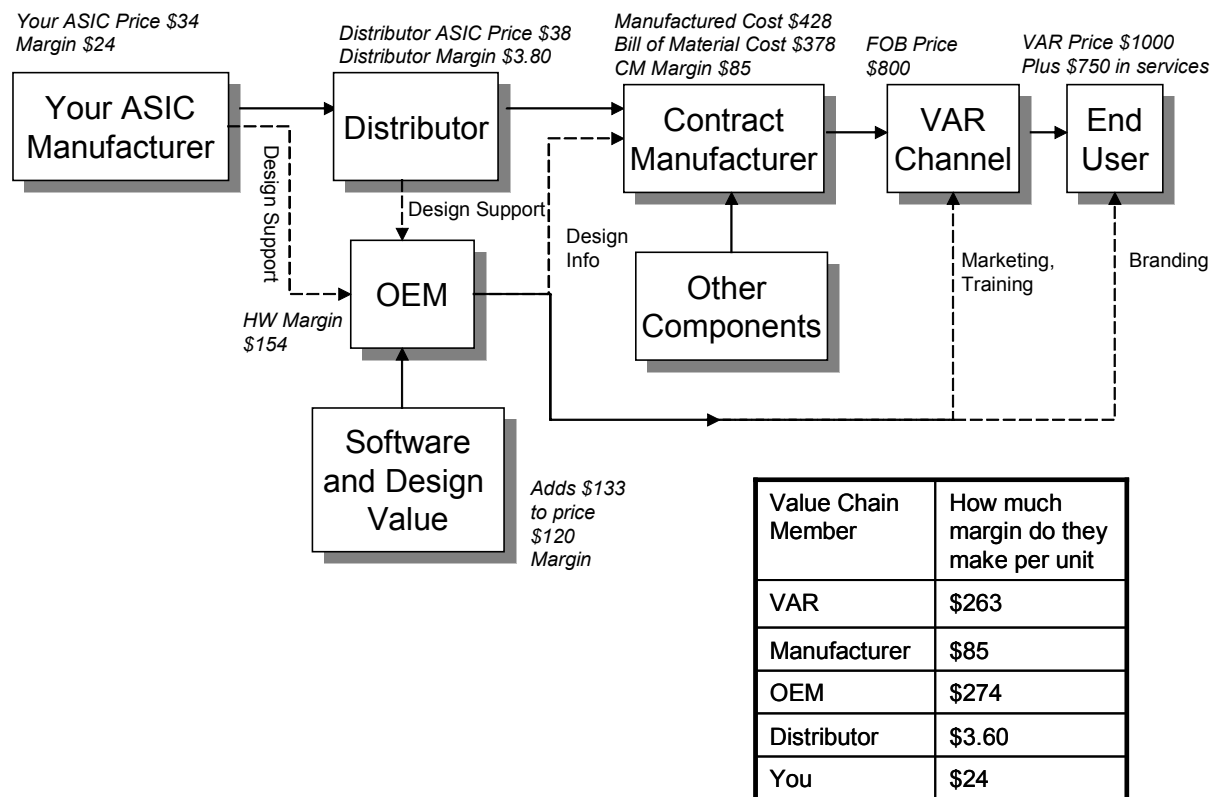


Figure 6. ASIC Value Chain Example

Suppose a large integrated manufacturer like Samsung begins to compete with your OEM customer base. It designs its own ASICs, software and systems. It has captive manufacturing and owns distribution warehouses around the world. It also sells direct to the VARs and typically prices its products 15 percent below the next highest supplier. This integration allows them to price products into the VAR at a much lower price than you can. How do your customers respond? What does it do to the price and volume of your products? How does it impact the relationship with your customers? What regions of the world will be most affected? Any particular products? Is there any opportunity to sell directly to Samsung? Is that a good idea?⁷ Is there a way to dramatically reduce cost on the existing value chain? How do you partner with your fulfillment chain to compete? Doing a similar value chain analysis for Samsung’s model would help to answer some of these questions.

Horizontal vs. Vertical Industry Structure

At the ends of the value chain spectrum are two industry structure types that show dramatically different states of technology development. The fully integrated enterprise (like our Samsung example

⁷ One of the most important questions is how to get all of this information in the first place. A company’s financial models, including the supply and fulfillment channel, are typically tightly guarded, trade secrets. In many companies, this information may be hard to get, even internally.

above) is the traditional model of value chain structure. In this model, a single firm is responsible for most of the value chain activities, and is referred to as a *vertical industry structure*. In other industries (such as the personal computer industry), each firm in the value chain focuses on a particular set of value chain activities — for example, making disk drives (see Figure 7). This model is usually called a *horizontal structure*. Christensen, et. al., [12] and [22] develop the compelling case that these industry structures reflect the technological maturity of a given industry. In the early stages, the technology for a new integrated product is complex enough that it requires that a single company be responsible for developing the entire product. It must manage the complexity of the design and manufacturing of the integrated product. As the technology develops and matures, integrating individual components no longer requires as much effort. Instead, effort and innovation flow into improving individual component performance. For example: in the minicomputer era, DEC made its own disk drives; in the microcomputer era, many disk drive manufacturers specialize and compete for business at the many computer OEMs.

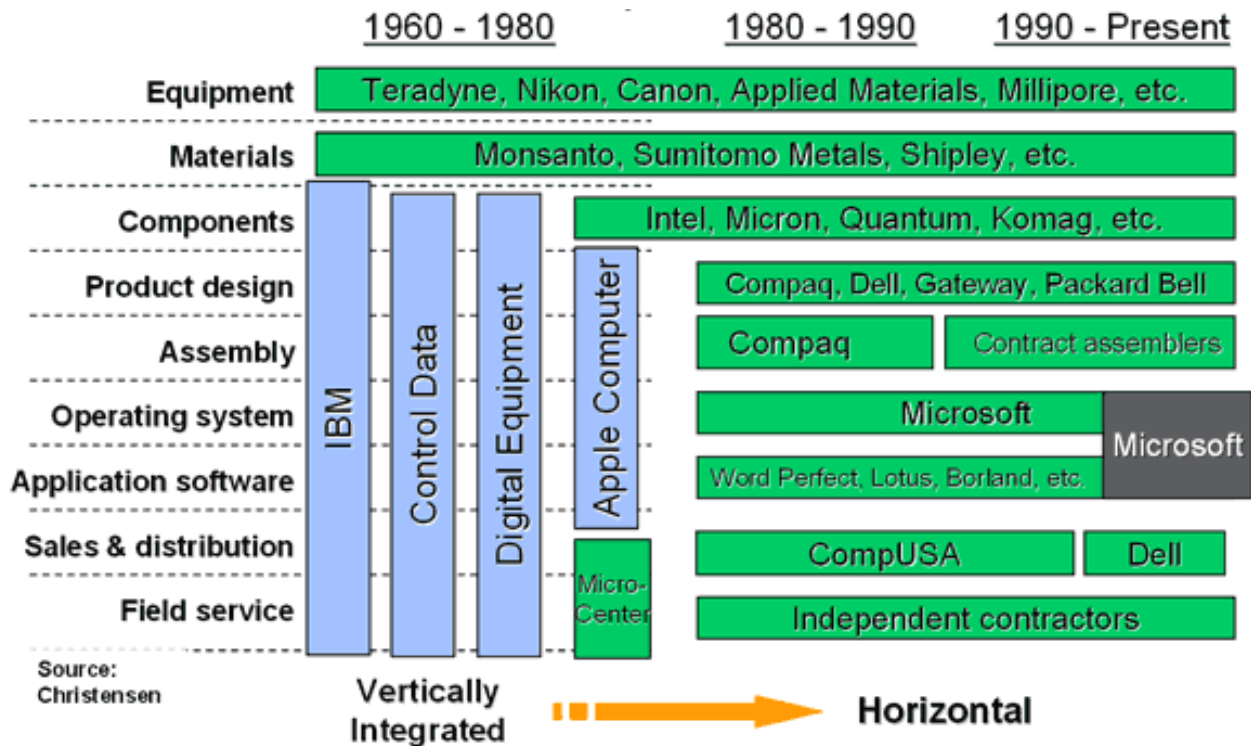


Figure 7. Vertical to Horizontal Transformation

For a technology company, knowing which industry structure is currently dominant, and whether the industry is in transition between structures, are very important strategy considerations. As the industry moves to horizontal, a danger arises of being stuck as a vertical solution provider. Opportunities to specialize also present themselves — taking a smaller portion of the overall revenue stream, but gaining greater efficiency and margin. In a horizontal industry, companies must focus intensely on excelling in a specific industry component.

Application Notes — Industry Analysis

Effective industry analysis begins with a deep understanding of the company's business. That understanding comes from long experience in the industry, coupled with current market data collected from customers, suppliers, complementors, industry analysts and line employees who deal with the market on a day-to-day basis. A strategy team should make use of whatever resources it has available to ground itself in the business. Creating an industry structure model is best done as a team exercise, perhaps with one senior team member creating a straw proposal for the model prior to the session. The team should not leave the model creation to a single individual for two reasons: no one person has a complete and unbiased perception of the market; and the rest of the team will not personally "own" the model if it is handed to them. During the implementation phase, each team member must become an advocate for the strategy and a deep, shared understanding of the industry will help them advocate.

How Much Data?

Strategy teams can easily get bogged down in collecting, refining and presenting industry and company data. Collecting data is comforting — the more you know, the more comforted you are that the company is either doing well, or at terrible risk. Obviously, perceiving success builds complacency. But even a deep-seated fear of catastrophe can cause a team to feel satisfied that it is doing its job by identifying conclusively, completely, and beyond a shadow of a doubt that the company is in deep trouble. The strategy team's executive sponsors may continuously send the team back for more information — either because the sponsors haven't fully internalized what the team has presented — or because they are delaying decisions, as humans often do when confronted with the ambiguity and uncertainty inherent in strategic action. Data is important, but data collection must be targeted at the central strategic question — not just at a broad understanding of the market. Use the data as a way to support the conclusions drawn from the team's experience. And, don't forget Disraeli: *There are three kinds of lies: lies, damn lies and statistics.*

How Much Time?

A typical industry analysis would start with one or more strategy team members collecting targeted information. This task should be bounded to a fixed time period, say two weeks. The team can use any data available at the end of that interval. The industry analysis session typically takes two to four hours, with the first hour or two used to share the available data. The team usually uses the remaining time to create the industry model. An experienced team can complete a 90 percent industry analysis in one or two hours. Then, the team lets the analysis sit for a few days to a week. After the session, the team may come up with new thoughts, insights and memories to add to the model. There's usually no point in revisiting major parts of the model. The first impression is often the best, and it's almost always good enough to move to the next step.

What's the Output?

The output from an industry analysis is often a completed Porter Forces model diagram. If possible, the team will find value in capturing major discussion points as background for later phases of strategy formation. Also, the team must make sure that the data preparation, and any specific information relevant to the model and the central strategy question, is captured.

Technology Adoption

Knowing where your company fits in its industry is a first step toward developing a strategy. However, in technology businesses, a company also needs a good understanding of how new technologies make their way from research lab to success in the marketplace. *Technology adoption* affects nearly every aspect of product and company development in technology companies. Technology adoption is a *process*, not a *destination* — one that companies can and must influence each time a new technology enters its marketplace. In this section, we'll cover some of the fundamentals behind technology adoption, and how companies can plan for and respond appropriately in the face of it.

What does the S-Curve Mean to You?

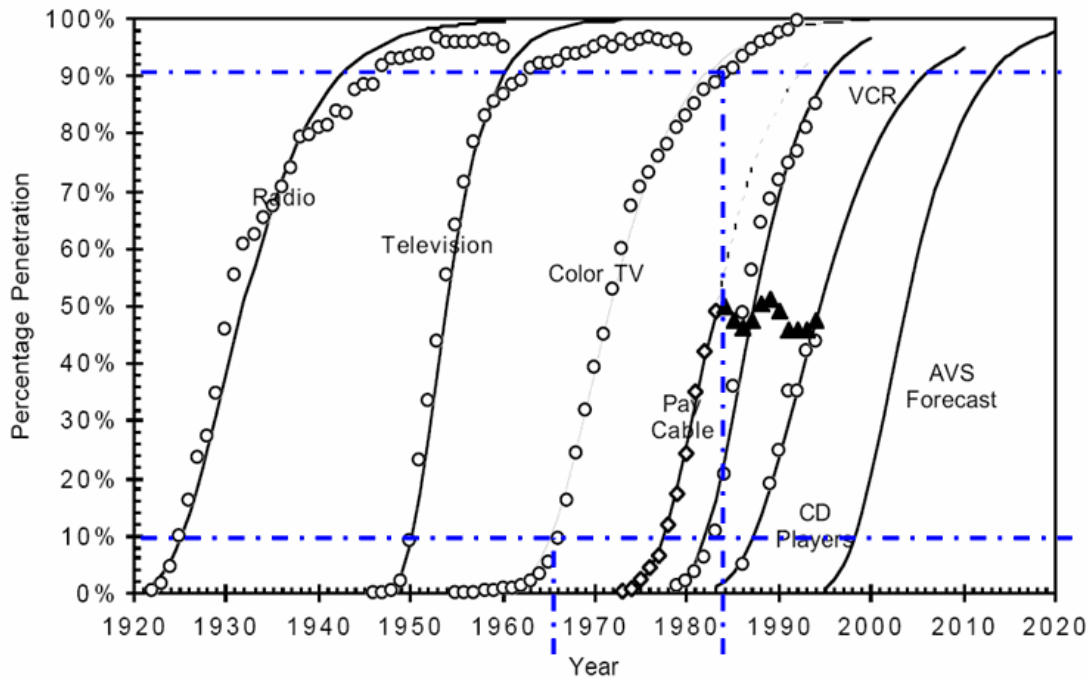
Based on the results of their study of Iowa farmers adopting hybrid seed corn, Ryan and Gross outlined the first modern model for technology adoption in 1943 [23], the S-Curve. The S-Curve and its derivative, the Bell Curve⁸, are the fundamental bases for understanding technology adoption. The rest of the models we'll discuss are explanations and extensions of the basic S-Curve model. Everett Rogers thoroughly outlines the history of innovation research (including an interesting recounting of Ryan and Gross's experiment) [14].

Ryan and Gross discovered that the adopting a successful⁹ new technology (in their case, hybrid seed corn) follows a predictable cycle. For the first several years of adoption, the *adoption rate*, or the number of new people beginning to use the innovation, is low. At some point, usually after three to five years, the number of users builds to about 10 percent of the total number of potential users. Once that level is reached, the adoption rate takes off steeply, until 80 to 90 percent of the potential users have adopted the innovation. If you plot the cumulative number of users over time, the result is an "S" shaped curve. Figure 8 shows some examples of S-Curves from a number of entertainment technology innovations. Note that the adoption interval, normally measured as the time between 10 percent adoption and 90 percent adoption, is quite long. By all accounts, color television — a very successful innovation — took 20 years (1965 to 1985) to go from 10 percent to 90 percent of the user base. Even the most rapid adoption on this chart, television, took ten years. Also, note that the interval from zero percent to 10 percent adoption can take significant time, too. In the case of color TV, this interval was ten years; in the case of black and white television, five.

These long intervals are typical, and at odds with many of the projections marketers assert as they develop business plans. Such plans often forecast early and rapid adoptions, and are quickly proven wrong as the realities of the technology adoption cycle set in. However, as we'll discuss in *Who's Your Financier?*, these projections stem from a very rational consideration, rather than marketing incompetence.

8 The Bell Curve is literally the mathematical derivative of the S-Curve. The S-Curve represents the cumulative adoption of a technology by a point in time. The Bell Curve represents the adoption during a particular time interval.

9 Of course, a successful technology follows a different path than an unsuccessful technology.



Source: Technology Futures, Inc.

Figure 8. Example S-Curves

Barriers to Technology Adoption

Of course, not all technology innovations are successful and some are spectacular failures. Nearly every large technology company with a reasonably long history has learned its object lesson in a massively hyped technology that failed miserably, much to the chagrin of all involved (especially the executive champions who bet their careers on the technology). For AT&T, the object lesson was the Picturephone® [24]. Originally prototyped in the late 1950s, Picturephone was a consumer video telephony service that would allow users to see one another as they talked. AT&T fully developed and test marketed the service. It had a few fundamental flaws that marked it for doomed, however. First, the end user needed to set up three telephone lines to carry the video and voice traffic, a very costly proposition and a high barrier to purchase. AT&T also needed to make significant upgrades in the central offices that carried video traffic which, in early roll-out phases, made the number of users who could interconnect low. And, most importantly, although early user response was positive, AT&T soon discovered that most people did not want to be seen by others in the privacy of their own homes. AT&T abandoned marketing the service in 1973.

Since Ryan and Gross, diffusion research has focused on understanding the causes of the S-Curve, and why certain technologies succeed and others fail. Spotting these adoption barriers and overcoming them is critical to successful strategy in high-tech companies. Even great technologies and products

will fail, if they can't navigate through the adoption challenges. This section focuses on some of the key models of technology adoption, and how to develop strategies that can overcome its barriers.

Gartner's Hype Cycle

The market research firm, Gartner [25], has captured a related phenomenon to the S-Curve. It has identified that, aside from actual user adoption, a new technology follows a predictable pattern within the consciousness of an industry. Gartner has termed this pattern the "Hype Cycle" (see Figure 9), as it reflects the mindset and attention given a new technology among the players in that industry. Industries are very susceptible to "group think" — with the key thinkers and planners in the industry attending the same conferences, reading the same reports and discussing the same trends with their customers and suppliers. They begin to believe that "if everyone else thinks this is going to happen, it must be true." As we'll see later, these industry leaders set the pace for their companies and, by extension, the entire industry which follows — lemming-like — down the hype cycle. By Gartner's definition, the hype cycle has five phases:

- **Technology Trigger** — The first phase of a Hype Cycle is the technology trigger, or breakthrough, product launch or other event that generates significant press and interest.
- **Peak of Inflated Expectations** — In the next phase, a frenzy of publicity typically generates over-enthusiasm and unrealistic expectations. There may be some successful applications of a technology, but typically, more are failures.
- **Trough of Disillusionment** — Technologies enter the *trough of disillusionment* because they fail to meet expectations and quickly become unfashionable. Consequently, the press usually abandons the topic and the technology.
- **Slope of Enlightenment** — Although the press may have stopped covering the technology, some businesses continue through the *slope of enlightenment*, and experiment to understand the benefits and practical application of the technology.
- **Plateau of Productivity** — A technology reaches the *plateau of productivity* as the benefits of it become widely demonstrated and accepted. The technology becomes increasingly stable and evolves in second and third generations. The final height of the plateau varies, according to whether the technology is broadly applicable, or benefits only a niche market.¹⁰

¹⁰ On a regular basis, Gartner plots an assessment of a variety of new technologies across industries for their subscribers, of the current phase on the Hype Cycle.

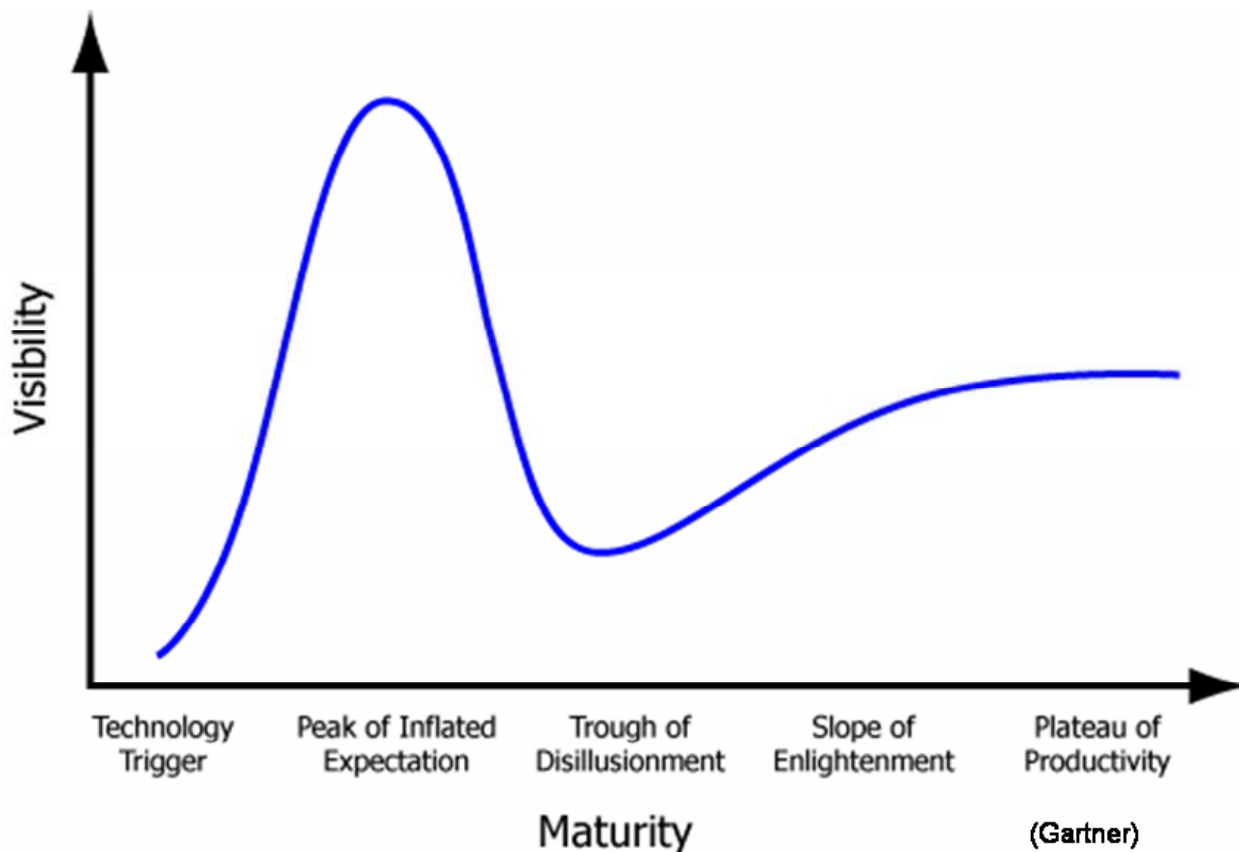


Figure 9. Gartner's Hype Cycle

The hype cycle models the ever present human optimism toward new technologies, especially among those who have chosen to make their livelihoods in that sphere. It shows that technologists believe in technology; have faith in their ability to make those technologies into useful and usable tools; and have confidence in the ability of others to see the value of and use the technologies. It also shows the backlash of skepticism that occurs when things don't go as well as planned. And, finally, it shows the gradual success of the stubborn, true believers who continue working until the technology is a success.

Some technologies seem to go through multiple hype cycles over the years, without ever truly emerging as important technologies. Mass use of speech recognition has been "around the corner" for thirty years. It has never achieved much penetration beyond niche dictation and cell phone name-dialing applications. Video telephony (and its companion, video conferencing) has had several hype cycles, starting with Picturephone and continuing to today. While many of the later implementations were reasonably practical, end user demand never took off. And, a running joke in the late 1980s and early 1990s was that each year was "The Year of the LAN" (for ten years straight) — before Novell and, later, Ethernet-based IP networks made local area networks commonplace.

What Makes an Innovation Practical?

Clearly, some technologies take off quickly; others languish for long periods of time; and still others never make it into the mainstream. Everett Rogers [14] built on Ryan and Gross' work to understand the factors that helped or hindered a technology's introduction. He identified five factors that drove up to 87 percent of the adoption rate.

Relative advantage — How much better is this approach than the currently used alternatives? Or, more simply, is it a better mousetrap? Users will be slow to adopt if they don't perceive that the new innovation offers much value beyond what they already know.¹¹ Column mounted manual automobile transmission shifters, better known as "three-on-the-tree" worked just as well as the standard floor mount shifters but never got broad acceptance and eventually faded away because it wasn't significantly better than the alternative.

Compatibility — How consistent is the innovation with the existing values, norms, past experiences, and needs of potential adopters. Lansing [26] found that farmers in Bali had high resistance to the introduction of new high tech rice varieties because they were incompatible with the religious practices set by their high priest and faithfully observed for hundreds of years.¹²

Complexity — How hard do users believe the innovation will be to understand and use? The classic problem in technology introduction is that technologies are invented by technologists who have no difficulty in master highly complex usages particularly in their area of expertise. Mere mortals (or even technologists from other disciplines) will not bother to adopt something they believe is too complicated. When the Apple iPod cracked the code for ease of use for digital music, the market exploded.

Trialability — How easy is it for users to try the innovation without major effort or expense? One simple way to overcome the resistance to adoption is let potential users try the innovation. Remember the vacuum cleaner salesman who dumped dirt on the homemaker's rug to demonstrate the efficacy of the new and improved product? This seemingly simple gimmick is actually a critical step in the technology adoption cycle.

Observability — How easy is it for users to see the advantages of the innovation and to see others using the innovation? Researchers have observed that innovations that are hard to see are slower to adopt than those that are in plain view. In many environments identifying reference customers who have used the innovation and are willing to discuss with other potential customers is a natural part of the sales process. Users' groups, trade shows and conferences provide mechanism for potential users to see the technology in action and observe its value.

11 Rogers does not explicitly discuss the relative cost of the innovation compared to alternatives. Cost is one form of relative advantage. Pure cost savings, however, is usually not an enormously compelling value unless the innovation is very strong in the remaining adoption attributes.

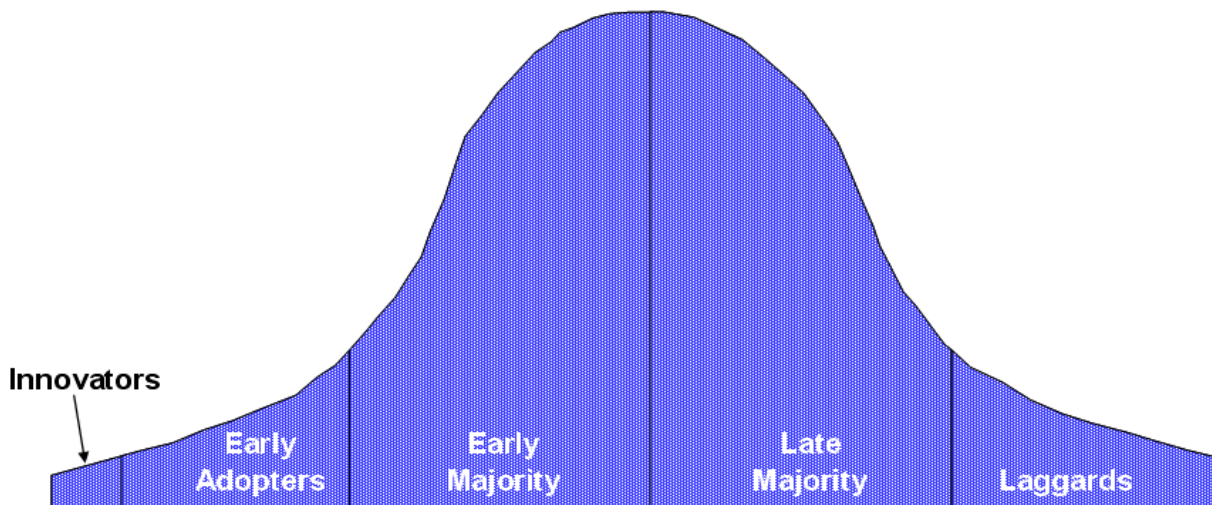
12 It turns out that the farmers were right to be resistant. The religious approach was in fact a well balanced, ecosystem friendly system. The new methods required to support the innovative rice varieties introduced disease, pests, erosion and other disruptions into the ecosystem.

A technology that has value, is not “too new”, is relatively simple to use and can easily be tried and seen in operation is likely to be adopted rapidly. These factors seem obvious but rarely does a company develop systematic strategies and plans to address them during launch of a new product. Most can be overcome with concerted effort and this effort can make all the difference.

Researchers have found that technologies are adopted over time by different types of users. These users adopt at different times based on their tolerance for these barriers and the appeal of the technology for resolving problems or providing status. Technology adoption over a population of users is typically normally distributed when measured by the number of users adopting a technology in a specific time period. It looks like a normal distribution curve and is really the mathematical derivative of the S Curve. Whether, in reality, technology adoption is normally distributed is not important. What does matter is that early adoption is slow then accelerates until the market saturates then begins to decline.

The Adoption Life Cycle

The adoption life cycle into 5 major groups based on when they adopt the innovation. While some researchers [diffusion of innovation] defined these in statistical terms, the characteristics and psychology of these different groups play a major influence on the adoption of new technology.



Source: Geoffrey Moore

Figure 10. The Adoption Life Cycle

The first users of a technology are referred to as *Innovators*. Innovators are adventurous, seek out new things in their area of interest and tend to relate to other innovators rather than to their local peer group. They tend to be technically proficient and tolerant of the complexity and idiosyncrasies of innovations. Technologies beloved by innovators fail as often as succeed but, for innovators, the joy is in the hunt.

Closely watching the innovators are the *Early Adopters*. In contrast to the innovators, the early adopters (also called first movers) are well respected by their local peers and have a record of success in identifying and using new innovations. As such, savvy innovators use them to advance adoption to the next phase and they become the industry oracles and mavens for the next phase of the curve. They are willing to tolerate some of the heavy lifting required to make a raw technology practical and they spend much more energy grinding out the mundane but critical problems around quality, support, maintenance and usability.

Once the early adopters work out the kinks, the *Early Majority* will begin to take in the innovation. The early majority (also called fast followers) represents the beginning of the mass market and look for proven solutions that can be adopted without large amounts of investment in time and resources. They consciously do not want to be the guinea pigs for new innovations but want to quickly capitalize on their value once proven. The producers of a technology generally do not begin making money from the innovation until the early majority is adopting in full swing. The technologist and the financier need to have the patience and wherewithal to wait until this stage.¹³

After half the potential adopters have picked up the innovation, the *Late Majority* begins to buy. The late majority has “been off doing other things” while the early market develops. They tend to be skeptical of innovations and will adopt only when a critical mass of their peers has both proven the technology and created the “peer pressure” to adopt. The late majority will often have the most extreme requirements for service, support and quality because avoiding disruption is more important for them than capitalizing on new innovations. Because size can breed caution, they are often the “big fish” in the market and become the juicy targets for the sales force. Landing these big fish when the technology (and its surrounding support infrastructure) is not yet ready can be extremely dangerous for the supplier. The author has been part of several projects where the sale was made too soon and the organization barely survived.

Finally, the *Laggards* will adopt (or maybe not). Laggards are suspicious of new technology and will wait until they don’t perceive it as being new. The laggards get scant attention from the technology industry because they represent a high investment in sales energy at a point in time when there are usually new hills to climb for the technology supplier. A laggard who is incorrectly believed to be a late majority big fish can suck lots of time and attention simply in the sales process.

But what if It’s Really New? The Chasm and the Disruption

Returning to the Picturephone, we can see that it did not meet several of the criteria for successful technology adoption. Users did not view it as having significant advantage over its predecessor, a standard voice telephone, and it was significantly more expensive. The Picturephone was not compatible with user lifestyles — no one wanted to be seen in their bathrobe. Because of these two fatal flaws, it never made it far enough in the adoption cycle for the remaining criteria, complexity,

13 Of course, it’s possible to build niche businesses around innovators and early adopters however these businesses never become large. By definition, they address only a small fraction of the market. And, once the innovation becomes mundane, these early leaders have moved on to the next big thing.

trialability and observability to be tested, but later video telephony implementation suffered from problems in these areas — and have also failed so far to be adopted.

In another telephony example, in the late 1970s, telecom service providers and equipment-makers realized that existing telephone networks, while outstanding for voice services, were not capable of providing advanced data services to end users. Data transport was too slow and the mechanisms for end points and networks to communicate control information (known as signaling in telecom networks) were rudimentary. The idea of providing advanced data services to end users was revolutionary at this time. Fax machines, personal computers, e-mail, cell phones and the Internet had not yet been broadly adopted. But visionaries foresaw a world where everyone would have advanced computing devices, and would want to communicate with one another in sophisticated ways.

AT&T, Nortel, Siemens, BT and many other industry players came together in the CCITT standards organization¹⁴ and created a new standard, known as Integrated Services Digital Network (ISDN) to enable this transition to happen. The standard allowed up to 128kbps of bandwidth to an end user (at a time when dialup modems were transitioning from 2.4kbps to 9.6kbps) and up to 2,048kbps between enterprise phone systems and the telephone network. It also introduced a network protocol known as Q.931 to allow advanced control between users and between the users and the network.

Vendors and service providers saw ISDN as the *next big thing* and rushed off to implement networks based on it. ISDN was introduced in its first phase in the early 1980s. Nothing happened. The few end users who had access to ISDN services did not use them, so service providers did not progress much beyond a modest rollout. Vendors scratched their heads and then realized that each vendor¹⁵ had produced implementations that were incompatible with other vendors. The only advanced data services users, businesses, had to buy two different kinds of phones and phone systems, if they wanted to use the service. If they bought switches from multiple vendors, telephone companies could not offer a uniform service across their networks. The vendors went back, tightened up the standard and implemented a new interoperable standard known in the United States as National ISDN.¹⁶

The first major barrier overcome, the industry began to market the service heavily in hopes of attracting users. Potential users now complained about the cost and complexity of implementing advanced services on ISDN, and still did not widely adopt it. For much of the late 1980s and 1990s, ISDN languished, despite massive carrier network investment. However, users did begin to find a few niche applications. Call centers began to use the capability to get the caller's number from the ISDN connection to route calls to the right agent. ATM machines used it to communicate with banking systems. In Germany, regulations against connecting modems to the telephone network prompted early online customers to use ISDN to connect to the internet. Telecommuters who needed broadband to hook to their work environments had ISDN installed in their homes. But, no broad, mass market application took off. Just as the demand for broadband picked up in the first years of the new

14 Now the International Telecommunications Union

15 In the United States, Nortel and AT&T

16 Standards in Europe, the other big market for ISDN, remained different — but because the markets overlapped little, the different standards did not create a barrier to adoption.

millennium, superior technologies like DSL and cable modems overtook ISDN, and it never achieved a wide adoption.

Aside from the niche applications, customers did not see a clear use for the technology and found it very expensive. Like Picturephone, ISDN did not provide a significant advantage over standard phone calls. To make use of the technology, end users often had to install new equipment and learn to use new features and user interfaces, making it both incompatible and complex. Given the need to install new equipment on both ends of the phone line, it was difficult for users to try the service without making the full commitment to adopt.

Both Picturephone and ISDN failed because they did not pass these adoption tests. Geoffrey Moore [15] observed that many technologies struggle in moving from the early adopter to the early majority phase. Technologies can progress rapidly from an innovator market to an early adopter market, because early adopters look to the innovators for inspiration. Once the technology successfully makes it into the early majority, an adoption *tornado* [16] often occurs, as potential mainstream users look for other mainstream users as “reference accounts” for the new technology. The transition between early and late majority is often a matter of statistics, rather than a true transition.

The transition between early adopter and early majority however is fraught with peril. Early majority customers refer to other early majority customers, not to early adopters, when they make purchase decisions. They always search for others like themselves to assure themselves that the technology is “ready for prime time”. They view the early adopters as risk-takers and visionaries. And those early adopters are truly willing to tolerate more “rawness” in a technology than a member of the early majority. Moore dubbed the gap between these two market stages the *Chasm* (Figure 11). Learning the tricks of *crossing the chasm* is fundamental to success in technology strategy.

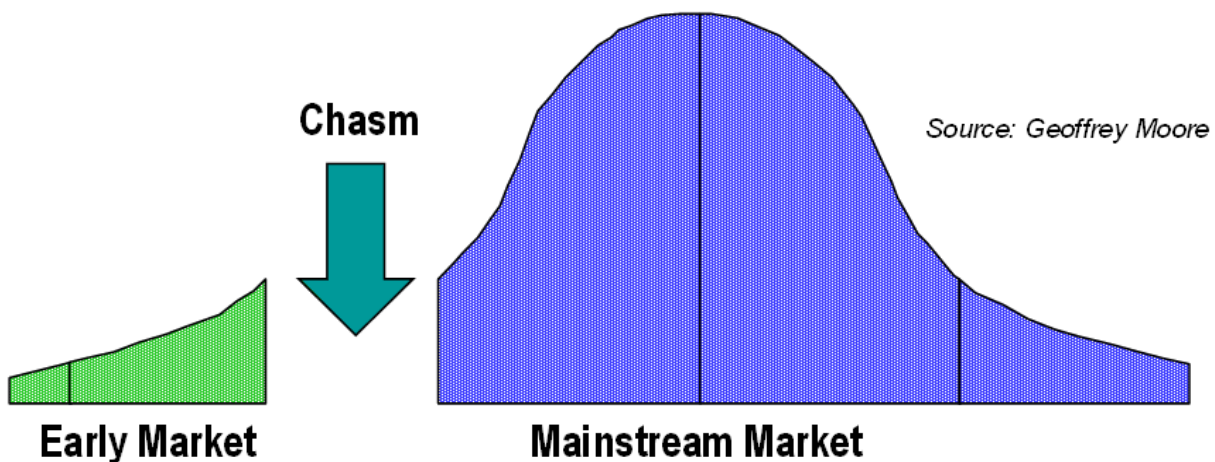


Figure 11. Discovering the Chasm

Because early adopters are buying technology to fulfill a strategic role as a *change agent*, they expect to use the technology as a competitive advantage over the mainstream market. The only way the technology becomes a competitive advantage is if a radical discontinuity exists between the old and the new. To gain the advantage, early adopters are willing to champion the innovation against internal and industry resistance, and overcome the inevitable bugs and glitches.

In contrast, the early majority is buying technology as a productivity improvement, and expects minimal disruption in business operations, looks for an evolution not a revolution, believes the new product should be compatible with existing products, and wants assurance that it will have a level of quality and reliability commensurate with other products in use.

Because of these differences in approaches and needs, early majority users do not look to early adopters for validation that a new technology is ready for their purposes. Instead, they look for other early majority customers to assure them that the technology's major problems have been overcome, and that the technology has proven itself as a solution. In some sense, the chasm can be traced to Rogers' *observability* factor. To adopt the technology, mainstream customers need to observe other mainstream customers using the technology. If mainstream customers do not yet exist, then observability does not exist. This dilemma is the *Catch-22* of technology adoption. Finding these initial early majority customers is the key to crossing the chasm.

Other pitfalls near the chasm lead technology marketers astray. Early in the adoption cycle, the valuable applications for a technology are difficult to know with certainty. Marketers often use a prospecting or shotgun approach with the early adopters, who really set the game for the prospective applications. As a result, the technology is tested in many new applications in search of the *killer application*. This testing is a valuable part of the adoption process. But as early adopters apply the technology in different applications, they identify application-specific feature and performance improvements that they push back on the technology developers. The developers quickly become consumed in meeting the disjoint needs of many early adopters and can't devote the needed resources to crossing the chasm to the early majority.

In some cases, the marketer must overcome the barrier of Metcalf's Law.¹⁷ When a technology requires more than one user to act in concert, or for multiple complementary technologies to work together to make the technology useful, then getting all the *balls in the air* becomes a primary requirement. The complementary relationship between portable MP3 players and online music services provides an instructive example. MP3 technology was first patented by the Fraunhofer Institut Integrierte Schaltungen in 1995. While MP3 was in one sense only an incremental improvement over previous sound encoding methods, it had one important characteristic — it allowed the encoding of CD quality music into a file size that used only a minor fraction of space on contemporary hard disks, and could be quickly transmitted over emerging broadband Internet connections. Among its conceived uses was the potential to be a replacement for traditional methods of listening to recorded

17 Robert Metcalf's law states that the "value" or "power" of a network increases in proportion to the square of the number of nodes on the network. When the size of the "network" is small, it has little value.

music. To be truly useful in this application, it needed a complementary technology — online music distribution. But the major problem was that it was convenient. Music producers and distributors viewed MP3 file sharing as a major threat to their traditional business models and mounted massive campaigns to prevent or eliminate online access to copyrighted music content. At this point, as often happens, innovative “renegades” stepped in, first among college students who had both the technical competency and a compelling desire to use the technology, and then among venture capitalists and entrepreneurs who could smell the value the new technology provided. Despite legal threats and press wars, these renegades persisted in assuring that online music distribution developed until, finally, Apple legitimized the business with iTunes, built a critical mass of legal content, and introduced the easy to use and relatively inexpensive iPod, paving the way for the early majority market. If not for Apple’s commitment and savvy approach, MP3 as a mainstream music distribution technology might never have crossed the chasm.

The need for adopting multiple technologies or users is common. Other examples include cars and gas stations, fax machines, broadband connections with rich Internet content and high performance PCs. In these cases, adoption does not depend solely on meeting Roger’s criteria, but on delivery of a complete “system” to support the technology use. This concept leads to Moore’s recipe for crossing the chasm. To attain widespread adoption, a “whole” product must complement a new technology. The whole product includes not only the technology and the physical product that embodies it, but also any complementary products, services or support infrastructure required to purchase, use or maintain the product. For cars, today’s whole product includes the car itself, the dealers, service stations, parts suppliers, the highway system, Consumer Reports, the Federal Department of Transportation, and the local department of motor vehicles. Each piece plays a key role in the purchase and use of an automobile.

Unfortunately, it’s impractical for a company, even a large one, to build such a broad whole product before the market has proven large enough to sustain the investment. Without it, however, the early majority will not buy the product. After identifying the required elements to create a whole product, the second major step in crossing the chasm is identifying a narrow application where a company or collection of companies can truly create a whole product specifically for that application. This application must be economically significant (i.e., both big enough to be interesting and one where the technology truly does add value). It need not be a killer application, simply a reasonably good one — but one that is feasible to address given the resources at hand. The first such application for a new technology is referred to as the *beachhead application*. The first application for Intel microprocessors were in handheld calculators [5] [10]. Calculators in the mid-1970s were an interestingly large market, well understood as a usage model, fully integrated into a solution by a single company, and did not require the many complementary technologies (disks, monitors, keyboards, mice, software) that the personal computer-makers of the time were struggling to develop. Calculators became Intel’s microprocessor beachhead.

Later, when IBM drove a whole product around the personal computer,¹⁸ Intel's microprocessor had already achieved a level of acceptance in calculators and was ready for its killer application. Moore refers to this stepwise addition of new target applications as the *bowling pin strategy*. Like a bowling ball knocking into a rack of bowling pins, once the first pin has toppled, the next ones in line fall, and then the next, until all practical uses of the technology have been found.

For each new application, the first satisfied application user becomes a reference customer for the application. That reference customer will draw other mainstream users to the application and prove the value of the technology.

The killer application, one that by itself drives much of the technology use, may be found at any point during the technology adoption cycle. It's not necessary, and somewhat undesirable, that the first application be the killer application. It's often better to prove a limited, low profile application in the technology, before taking on a highly visible, large scale application — much like an acting troupe testing its performance in the hinterlands before attempting Broadway. Many over-hyped but unproven technologies, that don't live up to their promise, take much longer to rise from the trough of disillusionment than a more gradual deployment.

Closely related to the killer application are *scaling applications*. While the killer application is the one that dominates technology use, scaling applications drive technology development and its surrounding whole product, so that it can serve a very large market. The killer application is usually a scaling application, if it is found early in the technology development cycle. Some applications may lead the technology development, but never achieve the dominating status of a killer application. Certain user companies have a history of scaling new technologies from small but proven applications into very large deployments. The Japanese multinational companies are particularly good at wringing out all the last bugs, incomplete feature sets, quality and reliability problems, cost, distribution channel barriers, and other things that block a technology from the mass market.

The appeal of landing a scaling customer is overwhelming. They are the "big fish" that will lead to large volumes and a marquee reference account. But, it is risky to land a scaling customer too early in the adoption cycle. The demands that they place on product development, quality assurance, distribution and support will dwarf the demands of other users and can overwhelm an organization still trying to get the first application to work. However, if the organization can successfully ride through the turmoil and high pressure of this phase, it's ready for anything.

Figure 12 shows the types of applications that best suit new technology at different phases in the adoption cycle.

18 Many other companies, including Apple, preceded IBM's entry into the personal computer space however they all lacked one critical element in creating a whole product. IBM validated the legitimacy of the category and by bringing its brand to the personal computer segment, gave customers both the belief that the category was real and that they could confidently buy the product without risking disappearance of the whole product through bankruptcy.

	Type of Applications	Types of Target Customers
Innovator	Any – You’re prospecting for usage models	Enthusiasts, Industry Insiders, Youths, Universities
Early Adopter	Those currently being promoted by industry thought leaders	Innovative CTOs, Start-ups, Industry Technology Leaders
Chasm Crossing	Simple, with clear value propositions that can be implemented quickly and completely	Mainstream customer with simple needs, willing to do a controlled experiment with your technology, and be a reference customer
Early Majority – Post Chasm	Sell the chasm crosser to everyone. Scaling application — large volume, high requirements	Has a need for the chasm crosser Scaling Customers
Late Majority	The same as the early majority — no invention among these users	The remaining “big fish”
Laggard	Ditto	At this phase, you should just be taking orders — move those high-priced market development resources to something new

Figure 12. Adoption, Applications, Customers

When a technology firm drives innovation, technology and new products into the market, crossing the chasm is a critical element of strategy creation. We’ll return to the whole product when we later discuss product strategy. Now, let’s delve a little deeper into types of technology, and what they mean for organization strategy.

Disruption

New technology can create new industry leaders rapidly. The pantheon of technology companies is filled with large companies that did not exist forty years ago: Cisco, Oracle, Microsoft, Intel, and Sun. New technologies can also destroy large firms just as fast: DEC, Prime, Data General, Wang, and Lotus. This rapid destruction and rebuilding results in a vibrant and rejuvenating industry: Schumpeter’s *creative destruction* [27]. But, what does it mean for the strategy of an individual firm?

In the 1870s, Western Union was the first large Information Age company. It had the smartest, most highly trained management in the industry. Alexander Graham Bell’s business partners offered to license the patent for Bell’s telephone to Western Union for \$100,000, but were rejected [28]. Within fifty years, Western Union’s dominance had vanished. Why did they miss the most critical and obvi-

ously superior innovation to ever occur in their market? Clearly, the ability for users to communicate by voice was preferable to using Morse code. Yet, Western Union's managers, with an opportunity to acquire the technology, passed. To anyone who has watched new technologies developing in large companies, the source of this seeming incompetence is obvious. The key telling point was in a statement the president of Western Union made, referring to the telephone as "a toy." In a large company, a statement like this from the chief executive drives the best managers, except for the renegade few, to drop the technology like a hot potato. But, why did Western Union's president ignore the toy that would later become the foundation for the world's largest company? This paradox is known as *The Innovator's Dilemma* and is the basis of Clayton Christensen's groundbreaking work. [13], [12], [11]

In the 1800s, Western Union's principle business was providing communications for railroads and banks over long distances. Their infrastructure could easily connect any end point to any other end point. They were acutely interested in new technologies that would allow them to operate this business more reliably or cheaply. Early telephones were only able to connect users within a few miles and required separate lines for each connection. The early applications were for communications within business that had a few locations scattered around a city and for in-building or in-home communication. Western Union did not view these applications as relevant to their business. By the time the central switch and the long distance trunk were invented, making the telephone suitable for long distance communications, the opportunity for Western Union to drive the market had passed.

At its core, the innovator's dilemma is that:

- Existing companies develop technologies that help them improve their existing products for their existing customers' applications. These improvements typically are those that increase performance along a dimension that customers value (e.g., more reliable telegraph keys).
- No rational reason is apparent to invest in a new technology that enables a different application for a non-customer and is not as good as their current technology for meeting their customers' needs (e.g., telephones).

At some point in time, two things happen:

- The company's existing products become "good enough" for all but a small number of very high end users who continue to demand better performance
- The new technology becomes "good enough" to satisfy the least demanding of the company's users

When this happens, there is often a rapid shift. Existing mainstream users begin to defect to the newer, lower cost technology as it gradually improves, and the "premium" product gets driven to a niche, high-end segment of users. [Figure 13]

Technologies that improve the performance of an existing application for existing users are referred to as *sustaining innovations*. Those that drive a new, lower-cost usage, and are usually offered by new entrants, are *disruptive innovations*. In one set of hands, a technology may be sustaining; in another, it becomes disruptive. One can imagine an alternative universe where Western Union decided to invest early in the telephone. In all likelihood, it would have used the patent to pursue entirely differ-

ent applications from those that the entrepreneurial Bell licensees chose, and the telephone, as we know it today, might be radically different.

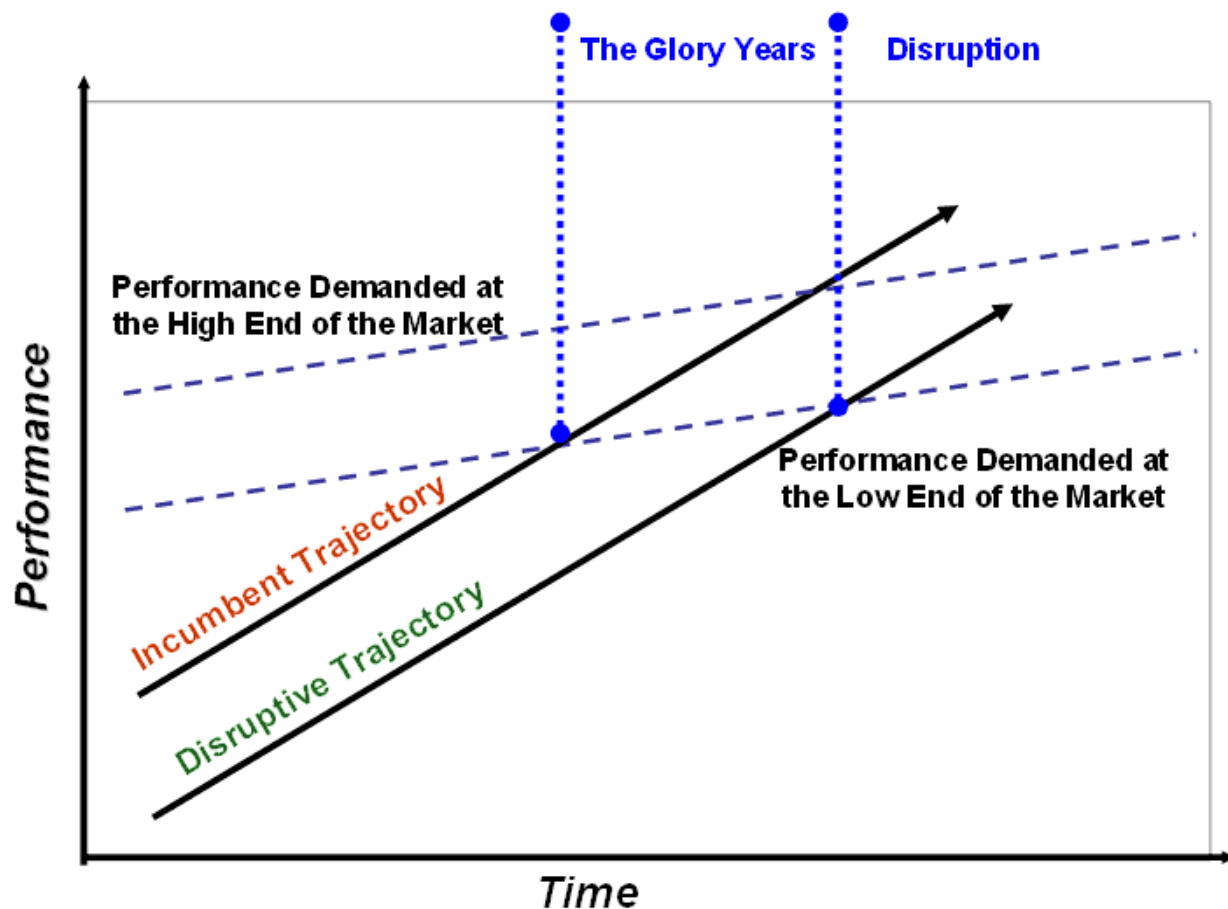


Figure 13. The Innovator's Dilemma (Christensen)

Companies are generally very good at developing sustaining technologies, but find it nearly impossible to create truly disruptive technologies for their existing markets. And in vibrant technology markets, where scientists and engineers continue to innovate, disruptions do occur. How do companies guard against disruption? Christensen [11] offers this approach:

- Watch out for a competitor or new entrant who introduces a product designed to serve users who don't currently buy products like yours because the current products are too expensive or complex, or because they want to do something slightly different from your traditional customers.

Sometimes, customers become so frustrated with the quality or service of the current offering, they will begin to look elsewhere. The Japanese car boom in the 1970s and 1980s was due both to fuel prices and the poor quality of American cars.

- If customers begin to turn their noses up at your latest innovations, it is also a sign that you have begun to exceed their expectation for performance and features, signaling that the existing offering is “good enough” for most users.

A major industry event like deregulation, or a change in import policy, can create openings for new players.

- Once you identify an industry shift that is potentially disruptive, try to predict how the new competitor and your existing competitors will react. Look at what resources they have and whether they’ll successfully be able to challenge you. Don’t fall victim to your own hubris at this point. Disrupters’ advantage comes from speed, nimbleness and the willingness to do anything to develop their new technology — not from size, reputation or existing customer relationships.
- Finally, develop a definite strategy to respond to the new entrant. Don’t treat it like a toy and expect it to go away. Think of it more like an adolescent that may grow to become an important challenger in adulthood. Note that it is nearly impossible to clearly decide whether a technology will be disruptive, sustaining, or just a toy until after the game has been played. While it may result in over-forecasting disruption, a little paranoia is a valuable thing.

The Tipping Point

Rogers, Moore and Christensen have taken an analytic approach to understanding the adoption curve. Malcolm Gladwell [17], a journalist rather than a social scientist, consultant or business professor, studied the human element of adoption. He noted the adoption often hits a point where it progresses from gradual adoption to what he termed *viral adoption*, in that it behaves much like a virus does in an epidemic. This point, The Tipping Point, is nothing more than the lower bend in the S-curves of Figure 8. He discovered that in making that transition to viral adoption, little things mean a lot. The environmental conditions of the adopters, the relationships between the right people, and the right “buzz” change the adoption speed radically at the Tipping Point. He identified three types of agents vital to making the tipping point occur:

- **The Mavens** — Much like the innovators, Mavens know everything there is to know about the innovation and are happy to share their knowledge with others who come to them.
- **The Connectors** — Like the early adopters, Connectors know everybody and revel in making connections between the “right” people.
- **The Salespeople** – Salespeople advocate for the innovation, and spend significant time promoting the innovation to the potential users.

These agents are usually well known within their industry or user community, and when acting simultaneously, playing their respective roles on behalf of an innovation, create the buzz that drives an innovation over the tipping point.

Increasing Returns to Scale

Finally, it's important to note some special technology characteristics, especially in computer and communications technology, that drive behavior different than seen in more mature industries. Many people are familiar with:

- **Moore's Law:** Formulated by Gordon Moore of Intel in the early '70s — the processing power of a microchip doubles every 18 months; corollary, computers become faster, and the price of a given level of computing power halves every 18 months.

Fewer have heard of two other "laws" that govern information age technology:

- **Gilder's Law:** Proposed by George Gilder — the total bandwidth of communication systems triples every twelve months. New developments seem to confirm that bandwidth availability will continue to expand at a rate that supports Gilder's Law.
- **Metcalf's Law:** Attributed to Robert Metcalfe, originator of Ethernet and founder of 3COM — the value of a network is proportional to the square of the number of nodes. So, as a network grows, the value of being connected to it grows exponentially

These laws imply that not only does supply of a technology increase as it is adopted, but also costs drop dramatically, and the value of using the technology increases manifold as more users adopt. As in basic economics, if supply increases and price drops, demand increases dramatically. As the industry progresses down the learning curve, the value to the winners is enormous, making the early battleground in the adoption phase the critical one. Geoffrey Moore describes these dynamics well.[16]

An additional dynamic applies to software products.¹⁹ Software has the interesting property of having almost zero marginal cost. The cost of producing the first copy of a particular software product can be huge. The cost of the second and more copies is almost zero. The packaged software industry has generally used a standard product model when, in fact the economics of zero marginal cost make this approach unnatural. Instead, as suggested by Raymond [29], software is more naturally given away or sold at a very low price to innovators, early adopters and the front wave of the early majority. Profits are made on a subscription or professional services basis as bug fixes, upgrades and license growth are required. RealNetworks, Adobe, Netscape and Microsoft have done well by giving away client software to enable the sales of the server and tools software. This approach speeds adoption by easing trialability and is the basis of the open source model. While the open source business model has not fully proven yet and goes one step further by giving away both the executable and source software, it does make adopting new software technology economically easier.

Application Notes — Technology Adoption

19 The comments here apply to software products sold separately from other products, not to software that is embedded within another product.

Managing the diffusion and adoption curve is one of the important tasks that the technology strategy team will undertake. The technology introduction cycle impacts the company in several contexts:

- The company is introducing a new technology in a product or service. This case can also include introducing an existing technology to a dramatically different set of customers, or for a brand new application.
- The company is facing a competitor who has introduced a radically new product to the company's customer base, or to a set of customers who have historically been underserved by the company.
- A supplier to the company is offering a new product that incorporates a significantly new product.

Let's look at the strategy team's role in each of these cases.

Introducing a New Technology

In the ideal case, the research department, a clever employee, a university, an outside inventor or entrepreneur, or some other innovator approaches the strategy team with an idea, a partially developed technology or even a prototype product. The strategy team's role is to assess whether the technology is viable as a product; identify potential users; examine how well the technology matches the company's existing business, channels, customers and capabilities; and determine whether the technology could be disruptive to the existing business. Two of the most important tasks are to discern the major barriers to adoption (and a plan for addressing them), and to identify the first target, early adopter customers. Occasionally, starting with the innovators is a good idea. However, often the innovators have already played with a form of the technology before the company even becomes aware of the opportunity. It's not wise to try to start with the early majority. You're not ready!

It's also difficult at this point to determine how heavily to invest in a new technology. Presumably, unless the company is a start-up focused on the technology, significant demands have already been placed on the company's resources. The size of the potential market for the technology is impossible to accurately quantify at the early stage. And, technology and market risks abound. We'll talk more about allocating resources to technology in *Who's Your Investor?*, but the approach venture capitalists use — staged increases in investment (or *tranches*) tied to accomplishment of specific milestones and great scrutiny applied to milestone misses — is one that works well in most environments. Recognize though, that a cautious approach to investing leads, in the success case, to being woefully behind the demands of the market. Caution is a way to avoid dramatic failure, not a way to achieve dramatic success. Conversely, early over investing detracts from operational focus and the "fire-in-the-belly" required of a successful entrepreneurial team. You can't win. Strike a balance between fat and lethargic and starved for resources: lean and motivated.

When it's time to launch the product, remember that not everyone will be ready. Locating the ideal first customer is hard, so even though it will lead to over commitment and some unhappy customers, you need to prospect a bit for customers and for applications. Most will not pan out, but a few will, and will hopefully lead to a solid mainstream application. It will certainly help to refine the technology and the right market approach.

In seeking an early adopter customer:

- Look for a customer with whom you have an existing relationship. Having a strong relationship will help smooth out the inevitable bumps during the introduction cycle.
- Don't use your most demanding or most risk-averse customer (These attributes often go hand-in-hand). A demanding customer is almost always a mainstream customer, not an early adopter.
- Find a customer who is willing to challenge the industry status quo, and who sees how the technology can do that. When you pick an existing customer, you run the risk that the customer is already entrenched in your traditional way of doing things. You can miss a disruptive opportunity or force yourself into cramming a disruptive technology into a sustaining model. Interestingly, an innovative, existing customer may be unwilling to work with one of its traditional suppliers on a new technology, preferring to do its experimenting with start-ups or new entrants. This customer hopes for greater control over how the technology is developed, and likes the more innovative blood that a non-traditional player brings.
- Seek out a customer who has a long time horizon before a critical business need requires the technology, but one who does eventually see that need.
- Try a customer who has sufficient technical resources available to work with you to develop the technology.
- Look for a customer who understands the need to provide early payments to you for trial systems, early product drops and professional services provided. Otherwise, financiers may lose their patience.
- Go with a customer who is willing to speak publicly about the new technology and their relationship with you.

Of course, such an ideal customer does not exist. You may not know the true nature of the customer until you're part way into the introduction cycle. You may become committed to more than one customer during the early prospecting phase. Ideal customers may suddenly find their budgets cut. The excitement of this time period includes ambiguity, uncertainty and disappointment. What is important is that you actually work with a few customers early in the introduction cycle. Products that remain bright laboratory ideas for too long, without field exposure, are almost certain to fail.

A New Competitor

One of your best customers asks you about Company X who has just launched a radically new product that doesn't exactly compete with your products but seems very innovative. Your customer thinks the new product isn't good enough for his needs but it certainly seems interesting. You attend a trade show and see a demonstration of Company X's product. The booth is full but it's clear, at least to you, that the technology is really not ready for commercial use. You get the end of the month sales reports and find a couple of your smaller and more price sensitive customers bought half of what they usually do. When you ask the sales team what happened, you find that these customers switched to Company X's product. Should you worry?

Yes, probably so. This is a good time to focus some serious investigative energy on understanding the technology, uses, likely demand, economic value and whether it faces any insurmountable barriers in its adoption cycle. The viability of the company producing it and its current lack of features and performance are less important than whether it offers something substantially better than other available products and whether it can overcome Roger's five barriers to adoption over time. The financial markets will solve the company viability problem for a good technology – someone will buy the company. Good long toiling in the "Trough of Disillusionment" can solve feature and performance gaps over time.

If you conclude it is a threat, what should you do? The most common first step is to spread fear, uncertainty and doubt (FUD) about the technology and the company supplying it. As a short term marketing ploy, this approach isn't bad but the risk is that you start believing the FUD yourself. Often, companies quickly create me-too alternative products that incorporate the technology to try to stave off the new entrant. Sometimes, this alternative is a necessary evil if you're caught off guard. However, the risk is that, as an established market player, you've validated to the industry that the technology is viable and given your customers a reason to evaluate it. The IBM PC certainly validated the personal computer in a way that Apple never could. The expectations placed on you will also be higher than they are for a new entrant. You will be forced to implement legacy features into your product while your competitor is given a pass and you'll have to provide levels of service and support commensurate with what you provide for your other products.

An alternative to copying the new entrant is creating a distraction in the market. This distraction often takes the form of a highly visible marketing campaign to pull attention to you and create interest in your existing product set. This tactic is at best a short term alternative but if your competitor is not strong may buy some time.

The best alternative, although very difficult, is to out-innovate the innovator and introduce a new technology that is a leap ahead of what the competition offers. Success with this tactic is rare but if you can do it and couple it with the massive new marketing campaign, then it will yield the best return.

Should You Buy?

Companies are not just suppliers, they are also customers and the time will come when a supplier will approach you offering a radically new product and try to persuade you to try it out. All companies need to experiment with new products and services in their supply chain to maintain a competitive edge. However, different companies (and individuals and departments within companies) have different risk tolerances. Before deciding to try, assess where you believe you and your company fit on the adoption curve for this particular innovation. Are you an early adopter, mainstream customer or a laggard?

If you believe that you fit the early adopter profile, try to assess how you would use this innovation, how ready it is to be sampled and how much energy you would be able to devote to bringing it to "mainstream" quality. How dependent will you become on the product? What if the supplier discontinues the product because he can't cross the chasm? Are you over-invested in new things to try?

Don't spread yourself too thin on great new innovations? Who else has bought? Has someone else already agreed to be that first customer for the technology?

If you're more of a mainstream customer, the first step is to ask for reference customers for the technology. If the salesperson hems and haws, then it's not ready for you unless the application that they are touting is so compelling to you that you must have it. When you get reference customers, be sure to check them out. Talk to them and get a sense of what they've done with the technology and how hard it was to get there. Try to decide whether the reference customer fits an early adopter or mainstream profile. Is their application similar to yours or radically different?

The innovator and laggard decision process is easier. For the innovator, simply decide if you want to try it, and then do it. For the laggard, simply wait until you feel there is no longer any choice but to adopt.

Completing the Analysis

If you've never done a strategic analysis for your company, the entire analysis phase will take at least three months including data collection and the inevitable executive reviews. Speeding it through faster usually winds up as a regurgitation of facts or jumping to unfounded conclusions depending on the bent of the analysis team. Thoughtful research, discussion and, often, intra-team disagreement are the key to making this exercise productive.

A refresh of the analysis, which should be done every year, can be done in a month or so if there are no dramatic market changes or changes in company strategy. While it's valuable to have professional strategists driving the strategy process, it's as important to have good team participation across disciplines in the company and to get some outside perspectives from customers, suppliers and analysts.

While there are many other tools that can be used for analyzing markets, industries and products, the core set of tools outlined in this section provide a strong foundation for a strategy team to use in preparing for the next stage – *synthesis*.

Planning the Trip: Synthesis

Armed with a good understanding of your industry and the coming technology transitions, you're now ready to begin the process of deciding what to do. Through the analysis phase, you gained more confidence in what you were already doing; you're gripped in panic that you are on the wrong track; or you see some good opportunities ahead of you that you want to start exploiting. Your desire for action is laudable and you *might* be heading in the right direction but, up to now, you still have only looked at the map. You now should spend some time plotting out your route.

In this section, we'll show you some of the route planning tools available. We'll focus heavily on *scenario planning*, a useful method for plotting out what's likely to happen in the future. We'll also discuss your choices of business models and product strategy. We'll talk about the key role of your financier in determining what you will do and what resources you have to do it with.

What's the Destination, Anyway? Scenario Planning

Inevitably, during the analysis phase, someone stood up and said: "It's obvious what's going to happen. Oil supplies will drain down in the next five years. Oil prices will go through the roof. We will be compelled to develop alternative fuel sources and vehicles." Perhaps, someone else stood up and said: "Are you crazy? The unexplored oil reserves in the world are vast. The current administration will simply open more of these areas for exploration and we'll be fine for the next thirty years." Both trot out charts, statistics and analysts who support their view. Who's right? More importantly, how would you figure out who's right? Is it important who's right? How would each position impact your strategy and what you do next?

In this section, we'll talk about scenario planning, a structured method, not for determining who's right, but for working through what the potential outcomes are and deciding what you should do given you can't determine which outcome will actually happen. Scenario planning has a long history and has been used for years in government think tanks and large corporations as a way to forecast the future and make decisions. Schwartz [18] provides one of the better introductions to scenario planning.

A scenario is a well articulated description of a future state of the world. It should be based on known data and knowledge about what is happening and could happen in the intervening time between now and the scenario horizon. It should be plausible but not overly constrained by the conventional wisdom. The qualitative description of the scenario is more important than a prediction of future statistics and metrics. Scenarios need to be centered around the situation in the external environment, not around the conditions in the organization or on the impact the organization can have on the environment. For most of the scenario planning process, the company plays a role of passive bystander. Only during the final action planning phase does the company make a difference.

What is the value of scenario planning? Often, in the strategy formulation process, each individual has an implicit view of what they think the world will look like in five to ten years and how that out-

come will affect the company. These future worldviews run the gamut from “not much will change” to “there’s a glorious world of opportunity” to “its all going to hell”. Sometimes these worldviews are well thought through and grounded in real world data, sometimes they are intuitive leaps and sometimes they are simply complacency and narrowness of vision. Regardless, the differences in worldview inevitably lead to disagreement on the direction that the company’s strategy should take. Without a way to compare strategies against different possible worldviews, the strategy debate becomes one of arguing over what is happening today and what sort of action it warrants.

Let’s start with a simple example. Imagine a strategic planning director and a product management director at medium sized company that makes telecommunications systems products. The strategic planning director has noticed in her visits to trade shows that many other vendors and customers have begun demonstrating solutions that incorporate video over IP. She begins to lobby the marketing vice president and the product management director to add IP Video features to the company’s products. The product management director has had a few customers who have recently asked about video over IP features on the mainline product that the firm makes. But, jaded by past IP Video flops, the product management director dismisses the idea as a “science project.” The discussion degenerates into an argument over whether or not to add the feature.

Suppose instead that the three players held a scenario planning exercise focused on the adoption of IP Video by end users and service providers. During the course of that exercise, they’re likely to come up with three basic scenarios:

- **Status Quo.** In this scenario, nothing much changes in the future world from today. IP Video never gets much traction in this scenario. The product management director is likely to hold this worldview.
- **IP Video Rules.** In this scenario, a killer application emerges that drives the adoption of IP Video to widespread adoption, replacing alternate existing alternatives. The strategic marketing director is likely to hold this worldview.
- **IP Video Niche.** In this scenario, IP Video finds a home in a number of specialized applications where it adds value. This worldview is a compromise middle ground.

One additional value that scenario planning has aside from forcing the players to articulate and justify their worldview, is that sometimes the discussion will lead to a non-obvious alternative scenario that none of the players has previously even considered. For example:

- **IP Video Retaliation:** In this scenario, IP Video is so disruptive to the existing cable companies that they respond with massive investment in new infrastructure to combat the threat. – A new opportunity for our firm!

Once the discussion converges with clarity on a few basic scenarios, the participants generally come to realize that they, individually, aren’t as omniscient as they thought and that all of the scenarios have at least some chance of transpiring. Action planning then becomes a process of deciding what to do in spite of the ambiguity, not one of staking out hard positions and defending them.

Scenario planning is a team effort. No one can sit in a room and develop a set of good scenarios and

expect that the larger group will support and understand that vision. The scenario development process itself is a key part of reaching a consensus on the future possibilities. Once a reasonable level of analysis has been done, a scenario planning exercise can be done in a day.²⁰ Usually, some follow up is required to execute on the results. But a common view of the possibilities can be achieved in a day long session. Figure 14 shows an overview of the stages of a day long scenario planning session.

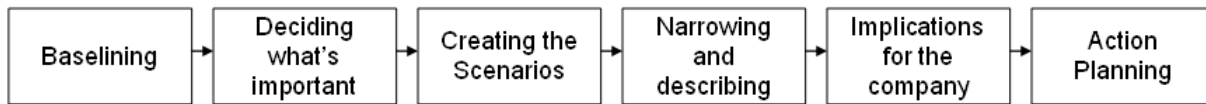


Figure 14 Scenario Planning Process

Most texts on scenario planning use a fairly similar process. This exercise can be completed in about eight hours with focused attention and good preparation.

Forming the Team

Prior to holding the exercise, you need to identify who should participate. The most important factor in selecting team members is mix. A scenario planning team should have representation from different functions in the organization (e.g., R&D, Marketing, Sales, and Operations). It should be mixed with individuals who have line responsibilities and those who have a broader industry view. It should have some members who have deep technical knowledge and some who “don’t get bogged down in details”. If the company culture allows, it should have a mix of organization levels but don’t bring in people who are intimidated by the top brass, CEOs who will dominate the discussion or vice presidents who are out in the hall on their mobile phones all day.

The team needs an experienced facilitator for the session. Slogging through without one will almost always lead to unsatisfactory results. If one isn’t available, appoint a team member to play the role to the best of their ability. The facilitator and team leader should sit down a few weeks in advance of the exercise, decide on the agenda and logistics and draft the problem statement that the team will use to frame the exercise. Figure 15 shows a typical scenario planning day agenda. A good problem statement focuses the discussion on what is meaningful and keeps it from becoming too “blue sky.” Here are some good problem statements:

IP Video appears to be gaining interest and attention from our customers. What will the IP Video market look like in five years? What would cause IP Video to become significant? What would impede its adoption? What should we do?

The recent hurricanes in the gulf coast have spurred a dramatic increase in investment in that

20 Some organizations (e.g., Royal Dutch Shell) use a much more rigorous process for scenario planning than is described in this book. They develop scenarios in a focused effort, monitor and revisit them frequently. While this dedication is valuable, it requires more focus on scenario planning than most organizations can afford. A day long exercise with tangible follow-up will yield great value with a minimum of investment.

region. Major corporations have announced investments in new plants and facilities in Louisiana and Mississippi. Is the region poised for long term growth? What should we do?

The growth in revenue from our traditional products has begun to dip. What's causing this dip? Is our industry maturing? Is this a long term trend? What should we do?

Note that each problem statement starts with an observed trend in the present day, defines what the important aspects of that trend are for the team and ends with the question "what should we do?"

Once the problem statement has been framed, the leader should call a short kick-off meeting with the team members a week or so before the exercise. In that meeting, the leader describes what the exercise will be about, the team agrees on the problem statement and members of the team should be assigned to bring any information and presentations that the team feels are necessary.

Greeting and Introduction	0:15
Scenario Planning Training	0:30
Problem Statement Recap	0:15
Market Analysis Overview	0:60
Break	0:15
Technology Analysis Overview	0:60
Lunch	0:45
Key Factors Brainstorm	0:30
Key Factors Selection	0:15
Scenario Formulation and Description	0:60
Break	0:15
Company Implications	0:45
Action Planning	0:45
Figure 16. Typical Scenario Planning Agenda	

Baselining

The first part of the scenario planning session focuses on making sure the team has a common understanding of the process, the background behind the problem statement and any related information that may be useful. This part may use as much as half of the time allocated to the session. The discussion and debate that occurs during this portion of the meeting is essential to the formulation of scenarios. During this phase, team members get information and assessments from the earlier analysis phase. They are free to discuss and dispute any of the conclusions from that phase but this is not the time to try to converge on answers.

The first part of this section is usually a short training on the scenario planning process for team members who have not participated before. Introductions, Meeting ground rules, expected outputs and meeting logistics also get covered here.

Next, the team leader reiterates the problem statement and reconfirms the team's agreement to that problem statement. Minor tweaks can be made now.

Now, the team members who were assigned presentations on relevant issues give them. These presentations can give data and analysis on any topic that is central to the question at hand. Typical topics are relevant market and competitive analysis, technology overviews, operational and financial issues, macroeconomic and demographic trends and corporate strategic initiatives. These presentations need to be germane to the problem statement and should encourage questions and discussion. Stick to the agenda during this phase. The baselining phase should not eat into the later phases of the process. If time gets tight, cut out non-relevant, redundant or banal content rather than cutting off discussion.

Deciding What's Important

In the next phase, the team returns to the problem statement and, in the context of all the material they've just heard, decide what factors are the most significant in determining the future. Many people come into the exercise with a preconceived idea of the important issues and, after listening to the analysis, find that their beliefs change. In our IP Video example, the engineering director might originally believe that technology quality is the key factor, the product management director might believe that its cost and price and the strategic marketing director, end user value. At the end of the discussion they might all conclude that government regulatory policy is the most important factor.

The best approach to converging on a small set of key factors is the structured brainstorm. There are many texts on structured brainstorming and they don't need to be repeated here. In a simple case, the facilitator throws open the floor to ideas and records them on an easel. Participants are not allowed to judge the ideas as they're being generated. When new ideas run out, the facilitator uses a "multi-voting" process to narrow the list to the top two to four factors. Multi-voting allows each person to select, in private, three to five key factors and then register their votes on the easel. The top vote getters are the team's consensus on the key factors. The facilitator allows some additional time at this point to confirm the team agrees with the list and to permit anyone to make a case for a key factor that did not make the cut. Figure 16 shows an example key factors list using our IP Video example.

Brainstorm List	Key Factors
Technology Readiness	Regulatory Policy
Price	End User Value
Cost	Ease of upgrading existing products
End User Value	Cost of network bandwidth
Regulatory Policy	
Application Ecosystem	
Competitive Pressures	
Cost of network bandwidth	
Channel acceptance	
Ease of upgrading existing products	
...	

Figure 16. IP Video Key Factors Brainstorm

Creating the Scenarios

Now comes the fun part: predicting the future. In this phase, the team develops descriptions of several worldviews in the context of the problem statement. These worldviews should be centered on a specific time period, usually somewhere between three and ten years hence. The key factors are used as the dimensions that delineate differences in scenarios. At this point, the team should not judge which scenario is more likely to happen. That debate can not converge because the future is unknowable. It's also okay to have some scenarios that are off the wall. These extreme scenarios often stimulate thinking and discussion that would not otherwise happen.

When creating scenarios, describe the future state first and then describe how it is likely to happen (i.e., what combination of events and key factor results would have to occur for the scenario to transpire). The differences between different scenarios should be significant. There's little value in creating many shades of gray. It's the contrast that helps decision making and action planning. Create as many scenarios as necessary to exhaust the creativity of the group. Usually, three to eight scenarios will cover the major possibilities. Once the full list is complete, you'll narrow it to three or four important scenarios.

The first scenario to describe is usually the "status quo" or "not much changes" scenario. The team should describe what it believes will happen if the current conditions and any trends that are past the tipping point play out with no major perturbation. This scenario is often written from the perspective of the late majority and laggard population. While this exercise might seem mundane, it usually leads to a rich discussion of which trends are too far gone to stop and what happens to the industry if there truly isn't anything new. In technology, "nothing new" is usually not a good thing. Here's an example of a status quo scenario for our IP Video example:

In five years, despite trials and small implementations, demand for IP Video does not become significant. No major applications are found for its use. End users do not adopt, seeing little value in

the technology. Demand does not justify upgrading existing equipment or buying new equipment to support the technology. Regulatory policy remains as today, neither encouraging nor discouraging IP Video roll-outs. The cost of network bandwidth does drop significantly but the lack of applications limits its use for IP Video.

Of course, for our firm, the most salient point is that demand does not justify equipment purchases. Having the surrounding description aids a deeper understanding of the situation. This description incorporates both what happens and why it happens. It is concise and descriptive. Details and data can be easily wrapped around it after the session but it's good enough for now.

In the creation of scenarios, a common team dynamic often develops. The germ of a scenario is best described by a single narrator who subscribes to that scenario. Others will chime in as a chorus to embellish the description. Often, naysayers will snipe at the scenario but this should be discouraged. Once the status quo scenario has been described, the facilitator should encourage other narrators to come forward. Let's suppose the strategic marketing director steps up with the IP Video Rules scenario:

In five years, the federal government has ruled that offering television programs over IP networks does not violate local cable franchise agreements and is not subject to state public utility commission regulation. Google and Yahoo negotiate distribution rights for most significant content from the major studios. Samsung introduces a very inexpensive and easy to use cable and DSL adapter that allows browsing and streaming to the TV. End users love this new service and begin to expand its use not only to TVs but PCs and mobile devices. Other, more interactive services like gaming and shopping follow.

In this scenario, the firm believes that there is an opportunity to be exploited and what remains is to determine how.

The exercise continues, adding new scenarios until no significantly new ones are offered. During this phase of the exercise, there should not be discussion on how likely a given scenario is to happen. Some scenarios may be very far fetched (at least in the opinion of some of the team members), but they can stimulate thinking that drives a more likely scenario. And, far fetched things can happen. While technologists and analysts had been forecasting the adoption of online services for years, no one in 1993 believed the frenzied growth of the World Wide Web was imminent.

Narrowing and Describing

Once the complete set of scenarios has been articulated, the team usually needs to reduce and refine. Some of the scenarios produced during the preceding stream of conscious exercise can be redundant with each other. Some scenarios may be "corner cases", relevant in very narrow parts of the industry (e.g., the Left Handed Icelandic Surfer scenario). Rather than have several similar or narrow scenarios, combine them so that there are only three or four very distinct and important ones. Embellish the scenarios with any details or additional thoughts that contribute to the richness of the scenarios.

For the remaining scenarios, now is the time to discuss what would cause each scenario to happen. What combination of factors would result in that scenario dominating? Is there a logical sequence of

events that would make the scenario happen? Are there any intractable barriers that would prevent it? The goal is not to pick a most likely scenario although each team member will develop an implicit view. And, scenarios for which there is no plausible combination of causal factors are difficult to believe in.

At the conclusion of this phase, the team has its scenarios in a form that they can be described to others who didn't participate in the exercise. They will have a common view of the possibilities for the future. But, it is very likely that they will not have consensus on which scenario will actually happen. That is the point of scenario planning – not getting consensus on the “one” scenario but on the possible set. Now, we move on to deciding what to do about that set.

Implications for the Company

To this point, the exercise has focused on the external environment and what happens regardless of what the company does. Now, the team goes back through each scenario and discusses how each one impacts the company. Several topics should be addressed for each scenario:

- If the scenario happens, what impact does it have on the firm? If it doesn't happen, what happens?
- If the scenario is good for the firm, is there anything we can do to assure or accelerate the scenario? If its bad, can we slow it down or prevent it?
- What does success look like for us in the context of this scenario? Is mere survival the goal or do we see it as a big opportunity?
- Does the scenario expose some weak spots or blind spots in the company? How do we shore these up?
- Are there things that we should start doing in light of the possible occurrence of the scenario? New relationships? New products? Things we should stop doing?
- How does this scenario compare to others in relative impact? Is it an important scenario for us or merely interesting?
- Does this scenario impact every part of the company in the same way? Some scenarios may be good for one group and bad for another.

Delaying this discussion until the scenarios are complete will help make sure that the scenarios themselves are not simply reflections of what our current efforts are directed toward. Many people have a tendency to believe that they are already on the right track regardless of external evidence. It's a side effect of optimism and a focus on results. Scenario planning is a time to temporarily put aside that optimism and focus on facts and reason.

Action Planning

The final stage of the exercise is action planning. Think of this stage as creating the 30, 60 and 90 day action plans. Failure to do this step and follow through makes scenario planning a feel good mental exercise. You must take action on what you've learned.

As a context for action planning, remember:

- All of the scenarios that you have created have a possibility of occurring. In many cases, they all will occur in part. One scenario could happen in one part of the world, another somewhere else. Action planning is not about picking one scenario and going with it. It's about deciding what to do in spite of the ambiguity. Usually, you will pick a dominant scenario that either is the most relevant to your company or you believe has the most likelihood of happening. Always, however, keep the other scenarios in the back of your mind.
- There are three main types of actions that come out of scenario planning:
- Start something new; stop something you're already doing. You could create a new product development team or a new marketing effort.
- Go get more information. Sometimes, this is an indicator that the team does not trust its own instincts or that it believes that the rest of the company will need more supporting data before accepting the scenario results. Other times, action planning really needs more data on what's happening in the market or what's possible with technology.
- Create indicators that will tell you what scenario is actually occurring. Find ways of watching the market so that when a sign comes up that one of your scenarios could be gaining traction, you note it and share it with the team.
- The team has to get the word out to the rest of the company. You've just gone through a series of complex discussions and thinking. Many of your colleagues have not had the experience and your results are valuable to them. One clear action that needs to come out of the session is a plan for communicating the results to the rest of the organization. Two good ways get the word out are a series of readouts to various groups in the company and a white paper describing the scenarios, the data behind them and the actions the company can or should take.

Figure 17 shows an action plan for our IP Video example.

Scenario	Action	Owner
Status Quo	•Continue current investment in non-IP Video products	•Product Management
IP Video Rules	•Charter small product prototype team to create technology proof of concept to show customers •Set up team discussion with two trusted industry analysts •Watch press releases by customers and competitors.	•Engineering •Strategic Marketing •Strategic Marketing
All	•Create scenario planning readout presentation •Schedule executive staff review •Schedule functional team readouts •Schedule team follow-up checkpoint	•Strategic Marketing •Marketing VP •Functional heads •Facilitator

Figure 17. IP Video Action Plan

Follow-up

Following up with the team on the action plan is critical. The enthusiasm of the day will wear off for most team members once they return to their daily routines. The actions should be measurable in a way that follow-up can be as simple as a done/not done check-in. Once the 30, 60 and 90 day actions have been done, the next steps should come naturally. In our example, if engineering creates a prototype team, the team will create the prototype and the learnings from that prototype will guide future product decisions. Some organizations will need a helping hand from a strategy “angel” who holds people accountable for keeping the strategy and actions in sync; others will naturally stay on course. More on this topic in the last section of this book.

Scenario planning is an excellent tool for getting a clearer view of what the future might look like and what you can do improve your position in that future. We’ll now move deeper into some of the tools for planning your strategic moves. First, let’s talk about who *really* sets your agenda: your financier.

Who’s Your Financier?

Unless your firm is a self-funded private company, it has a financier or, more likely, more than one. These investors have claims on what you do with your resources and truly do set your agenda. Even in the self-funded case, a bank has likely supplied some level of debt funding and has set some priorities for what you can and can’t do with your money. The set of constraints established by your investors limits and shapes the strategic choices you have. You are, of course, free to recruit new investors but that has its own challenges and simply replaces one set of constraints with another. In this section, we’ll talk about what investors care about and how their concerns shape what you do.

It’s overly simplistic to say that financiers only want to make a profit. In fact, most investors make their investments in the larger strategic context of their own business. They have positioned themselves to *their* investors as a particular type of investment company that finances companies of a specific type. If your investors are high tech venture capital firms specializing in stage two biomedical technology companies, then your strategy had best align with that. You would make other choices if they were institutional investors buying blue chip public companies. If you do not fit their target profile, they should not be investing in you. Even the individual “angel” investor has specific personal reasons for funding you. You can not abuse that trust. Not only is it unethical, it will greatly limit your ability to get more funding in later stages of development if your angel believes you acted in bad faith.

In shaping strategy, knowing your investor is a personal thing. There must be an individual or group of individuals that you can present your strategy to and get a yes or no answer.²¹ A large, faceless, unreachable pool of investors won’t add much value to your strategy. You need to identify the “approvers” before you begin strategy development. If you don’t, there’s a good chance your strategy won’t meet their approval.

21 In reality, the answer is usually either no or “Here’s a little money to try it out. Come back with success and we’ll give you some more.”

Financing in Large Companies

In large companies, the external investor pool is usually large and faceless. If you're the CEO of such a company, then the board of directors is the proxy for your investors. Major new strategic directions must be approved by the board and the board will hold the CEO accountable for their execution and success. But, if you're further down in the organization and the board is not accessible to you for strategy approval, you need to identify another investor proxy. Most often, for anything having measurable impact on the budget, the investor proxy is the divisional or group vice president and his or her staff. A competent vice president will look at any new investment through four lenses:

- Does this investment align with the company's overall strategy and direction? (Or, more simply, will my boss like it?)
- Does this investment align with the objectives I have set for my organization? (Or, will my boss think it's my job?)
- Can I afford it? (Or, will I have to ask my boss for more money?)
- Is it a good idea and are the people proposing it competent to execute? (Or, will it make me look good?)

The VP would not have gotten to his or her current position without using this thought process to evaluate new ideas. Teams that have formulated brilliant new strategies that fall on deaf ears at the executive level often rail at the stupidity and politicalness of the boss, but, in the end, there are only two choices – convince the boss or find another financier.

Starting new ventures that are not closely aligned with the core business of a large company face significant strategic inertia. Robert Burgelman explored this inertia in detail in [6]. He provides a model for strategy formation in large companies and details the many challenges that new businesses within Intel have encountered. In Burgelman's model, there are two sources for new strategic initiative: the top down corporate strategy developed by the CEO and staff and the spontaneous, bottom up strategic experiments (a.k.a., skunk works) that smart people working lower in the organization develop.

Burgelman calls the first type *induced strategic action*. This type of action is what we visualize when we think of a purposeful CEO setting strategic direction. Lou Gerstner's drive to remake IBM into a professional services company is a good example of induced strategy implementation. Often, the innovations that come from this source are sustaining rather than disruptive innovations in Christensen's model.²² Sometimes, too, the over exposure they receive within the company because of their special status can be harmful. Over investment and too much spotlight too early can be as fatal to a new idea as under investment. The hype curve works within companies as well and today's shining star can quickly wind up on the scrap heap.

The second type of strategic action is *autonomous strategic action*. This type often originates among

22 IBM's shift to services was really a business model shift rather than a technology innovation so is difficult to categorize as either sustaining or disruptive.

engineers, first line managers or senior managers who see an application for a new technology or among marketing people who see a new market opportunity. A champion or set of champions develops organically, sometimes with tacit approval (but little resource allocation) from higher management and sometimes completely invisibly from senior management. Autonomous strategic efforts can often progress quite far on a shoestring but, inevitably, scaling out to a full product and market launch requires enlisting the internal investors to provide more resources. The financing effort can often sap the energies of the champions even if the new concept aligns closely with overall strategic context of the company. If it does not, the struggle for resources can be quixotic. The famed failures to commercialize brilliant innovations like the computer mouse at Xerox PARC and stereo sound at Bell Labs are the result autonomous innovations not receiving sufficient internal funding to get to market. Disruptive innovations are often first conceived and prototyped as autonomous innovations at the very firms they will disrupt. AT&T tested voice over packet technology in the early 1980's. They shut down development of the technology, seeing little commercial application. The technology would later re-emerge as a major AT&T disrupter, voice over IP, in the twenty first century.

Burgelman offers an approach to funding and staffing opportunities that may not fit the main line "induced strategy" of the company. This framework is similar to others that address the need to support corporate "intrapreneurship". It uses two dimensions, strategic importance and operational relatedness, to determine the appropriate structure for a new venture. While internal venturing is an important part of generating new technologies and ideas within large companies, the success rate of these autonomous strategy ventures is very low. Success almost always depends on the skill and determination of the idea champions who press on despite the lack of resources and the negative impact their quest has on their careers. As Christensen states and the empirical evidence supports, large companies are best at sustaining, induced strategy efforts. Frustrated entrepreneurs in large companies often seek alternative funding outside the company.

Financing in Small Companies

Those frustrated entrepreneurs often turn to the start-up company approach to bring their ideas to fruition. In a start-up, the financiers are an integral part of the company's development. They provide not only funds but guidance and constraints on the company's strategy. Care must be taken in aligning investors. The right investors can accelerate success; the wrong investors can doom the company before the start.

The venture capital industry is almost synonymous with the concept of financing technology start-ups. Venture capital has been a critical part of the establishment and nurturing of many new companies especially in the US. But, it is only one source of funding and isn't always the best. Venture capital is "expensive" in two senses. Venture capitalists fund risky ventures and therefore expect high returns on their investments. They demand relatively high ownership stakes in the companies they fund in order to assure these returns. And, because the failure rate of these investments is high, the investors become directly involved in many of the strategic decisions. On the positive side, this involvement can provide advice and contacts. On the negative side, it can be seen as meddling and, when things go bad, the venture capitalists don't hesitate to take action to remove the entrepreneur.

There are other sources of funding for start-ups especially in the early phases. The best sources early on are self-funding and angel investors. Self-funding — where the entrepreneurs themselves supply the money — removes the financier from the strategic equation and allows experimentation before commitment to a specific strategy. It also removes the overhead of the financing search itself. It, of course, puts the entrepreneurs in a double risk situation, not only are they not receiving an income, they are spending their savings to create the business. With those higher personal stakes, it can also exacerbate disagreements between the entrepreneurs who are under greater stress. Angel investors, usually wealthy individuals, are a middle ground between self-financing and venture capital. They usually invest less than a venture capitalist and are less involved in company strategy and operations but they remove some of the personal risk for the entrepreneurs.

Other sources of funding, banks and going public, are usually off limits to the entrepreneur. The level of risk in start-ups is too high to attract these funds. One of the lessons of the internet boom was that going public too soon is not good for the operations of a technology start-up. The additional overhead of managing a public company is a distraction that early stage technology companies can not afford.

A typical cycle for entrepreneurs and start-up ventures is (outlined in greater detail in Gordon Bell's book on High-Tech Ventures [9]):

- Quit job
- Self-fund experimenting and early prototyping
- Get angel investor and begin developing product and customer engagement
- With positive customer interest, obtain seed funding from venture capital to develop first product
- With first product sale, get a second round of venture funding to scale operations
- Keep going and don't run out of cash

This last point is one of the key maxims of venture operations. As Alan Shugart said, "Cash is more important than your mother." Getting and conserving cash is the critical operational issue for most small businesses. Getting cash is a function of financeability. Per Bell, financeability has two components, internal and external (See Figure 18).

External Financeability	Internal Financeability
<p>The Economy — What condition is it in? Is it favorable for venture investments?</p> <p>The Market for the Product — Is it proven or speculative?</p> <p>Number of Competitors — Is it too crowded or too empty?</p> <p>Financial Community's Health and Interest in the Sector— Is this a current hot area, passé or too early?</p> <p>Desire of Financier to be in the sector — Is this the right financier?</p>	<p>Ability to Operate to Plan — Does the entrepreneur have what it takes? Is the plan realistic?</p> <p>The competitiveness of the product — What makes it different/better?</p> <p>Ability to create a competitive market — What resources, channels does the company have?</p> <p>The company's perceived intangible value (people, synergy, etc.)</p> <p>The return that the firm offers its investors on their investment — Is the opportunity big enough? How much risk? How much funding will be needed in the future?</p>
<p>Figure 18. Venture Financeability</p>	

A venture that can't meet these requirements will not get funded. Of course, financier is the arbiter of whether or not the market and the company are financeable and it's the entrepreneur's job to convince the financier.

Getting in Over Your Head — Financing and Outrageous Market Projections

Anyone who's worked in technology long enough has seen a project that has, early in its history, made extremely optimistic estimates of the potential market for the product. These grandiose projections are usually both too large and too early when compared with what really happens and with what could realistically be expected to happen given normal adoption cycles. Somewhere during the program, the marketing people become a laughingstock for their naïve belief in the market. The sales and engineering people come under great pressure to hit the unachievable target. Senior management is often swapped out for failure to perform and the new managers wisely set a new target much lower than the early target. Comforted by this newer, more grounded estimate and the fresh credibility of the new team, the financier continues to invest in the program.

This cycle is so predictable and happens so frequently that its occurrence has to be attributable to more than simple marketing incompetence. If technology marketing were such an immature science that its projections were completely unreliable, there would still likely be a reasonable number of cases of *under projection*. Even leaving aside the natural optimism of technologists, there is something more systemic happening in this consistent over projection. The clue is in the financing process.

Technology financing, no matter the source of funds, is a risky business. Financiers expect a high return from the winners and are willing to live with a reasonable number of failures and mediocre performers. Competition for venture funding is high and entrepreneurs must convince the finan-

ciers that their investment will be a winner. A common rule of thumb in new ventures is that, of ten investments, two will be outright winners, three will be outright failures and five will be mediocre successes or survivors. This rule implies that, even in the best case, eight of the ten ventures will be victims of early over projection. Often, even the winners don't hit their early forecasts of success.

For the marketing managers and executives in these ventures, this dynamic creates a serious dilemma. Without over projection, they will not get funding. With over projection, the venture, and their jobs, are at risk over the long term. Most entrepreneurs will side with over projection. Some may view it as unethical to knowingly over project to obtain funding. However, the natural optimism and enthusiasm of entrepreneurs often clouds their realism and venture funders are unlikely to fund a "realist." They are looking for optimists and dreamers as entrepreneurs and are willing to accept the risk of over projection. This dynamic has become so institutionalized and has worked so well for financiers that it is unlikely to change. The employees of the ventures need to go into new ventures understanding this dynamic and making their choices knowing the likely outcomes.

What Do You Want to Be When You Get There? Business Models

Convincing a financier of your financeability requires a business plan and a good plan requires a clear view of the firm's expected business model. A business plan is a full strategic and operational plan for launching a new business. A business model, a subcomponent of a business plan, is far simpler. A business model defines how the company will be distinct from its competitors (i.e., its competitive advantage) and how it will make money (i.e., a revenue and expense model). This section discusses both the strategic business model choices and how those choices drive and create revenue opportunities.

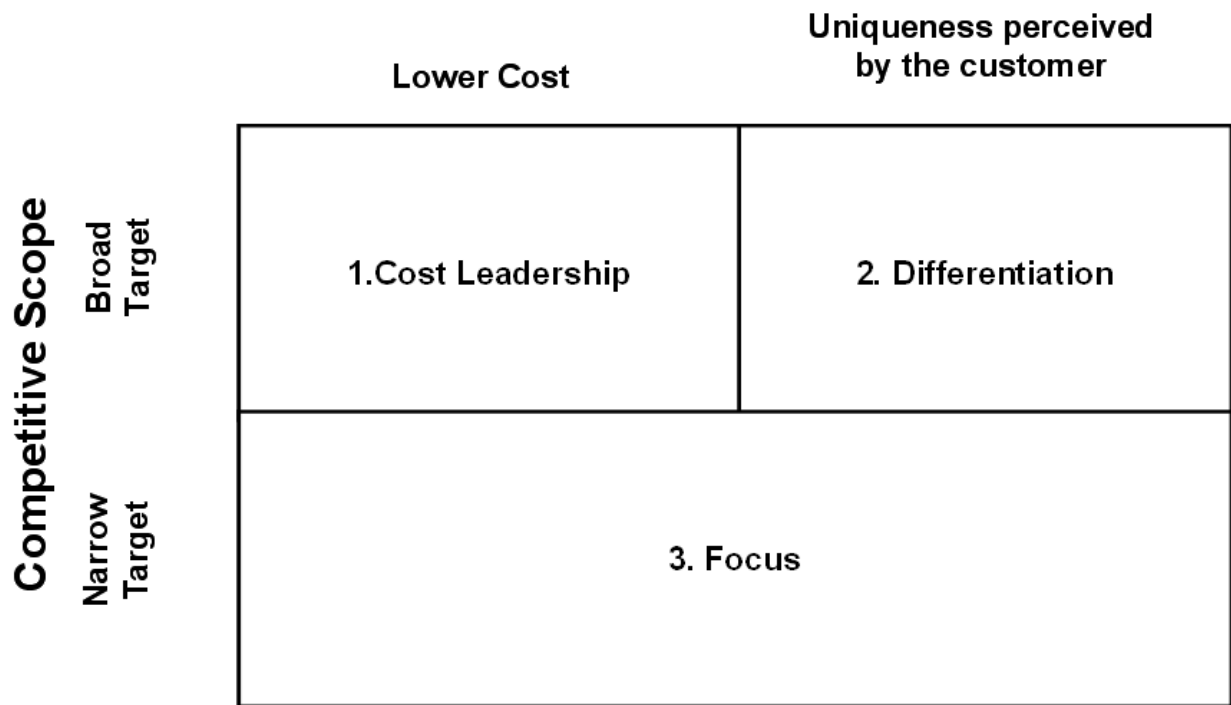
Porter's Competitive Strategy Models

To begin the discussion of business models, we again return to Porter [1]. As he did for industry analysis, Porter created a very simple and elegant model for describing how a company can compete. In Porter's universe, there are really only three ways that a company establishes a position relative to competitors (See Figure 19).

The first competitive method is to be the lowest cost²³ producer in a given industry. In the retail industry, Wal-Mart is an excellent example of a cost leader. Wal-Mart has chosen a strategy of relentlessly lowering cost through purchasing leverage, IT, single store models and a host of other industry specific approaches. It allows them to offer low prices and still be one of the most profitable retailers in the world. In the personal computer industry, Dell is the low cost computer OEM, using some of the same cost reduction approaches as Wal-Mart and using a direct to customer distribution model and build to order manufacturing process that greatly reduces inventory and distribution

23 Note that cost is not the same as price. Although many companies who have the lowest cost structure use that cost advantage to compete by offering the lowest prices, that strategy is not necessarily the only one that a cost leader need pursue.

costs. Southwest Airlines achieves low cost by, among other things, using a point to point flights (rather than hub and spoke), turning planes around at the gate much faster than others to increase utilization and by building their fleet entirely out of a single model of plane to assure low training, maintenance, sparing and planning costs. Often, especially in more traditional industries, being the low cost provider is a matter of being the largest supplier. However, as these three examples show, it's possible for a company to evolve, with unrelenting focus, to become the low cost supplier despite the entrenched presence of much larger competitors. Being the low cost supplier sounds like a very appealing place to be, however, there can be *only one* low cost supplier in an industry. The second lowest cost supplier must either find a way to be lower cost than the other guy or to use a differentiation or focus strategy and its "pretty good" cost structure to compete.



Source: Competitive Strategy, Porter

Figure 19. Porter's Competitive Strategies

If a company wants to reach a broad target market but is not the cost leader, the only other approach is one of differentiation. Differentiation means excelling in one or more company or product attributes that are highly valued by customers. Honda got its start as a maker of high quality engines. It then went into any business that valued a high quality engine: motorcycles, cars, chainsaws, generators, etc. Nordstrom made its name by differentiating on the quality of its service. In technology, IBM has succeeded by being a full product line, full service provider. As with a cost leader, a company pursuing a differentiation strategy must understand and focus on the key aspects of its business that add value. It is not possible to excel on all dimensions of performance as a company or as a product. And, few buyers need exceptional performance on all dimensions (or are willing to pay for it).

Smaller companies generally need to choose the final strategy model: focus, often referred to as a niche strategy.²⁴ In a focus strategy, the company chooses a narrow, definable portion of the market that it can serve better than any other provider and aggressively meets the needs of that narrow market. It may forgo opportunities in the broader market to assure that it does not alienate its loyal core or lose focus. If it does brand extensions, they are generally to better serve the focus market than to serve a broader market. Companies that offer premium products, for example Chris-Craft boats, are often focus companies. There are many other ways to focus, however. Lampshades, for example, are large but inexpensive. Because of their bulk, it's not cost effective for a manufacturer to ship lampshades long distances. Therefore, lampshade manufacturers tend to have a geographic focus, selling only to those customers within a fixed radius of the factory. Large companies can choose a focus strategy as well if the market they are serving is large enough and they are able to protect it from entry by others. Apple has successfully pursued a focus strategy for thirty years, concentrating on those markets that favor its design elegance and ease of use.

Failure to choose one of these three strategies leads to a condition known as "stuck in the middle." Companies that are not cost leaders and don't excel on some dimension that is highly valued by some set of customers struggle for long periods of time. Often, a company that originally led can fall behind when a new entrant surpasses it. In retail, Sears, K-Mart, Woolworths and other regional players led the full line and discount department store market. Montgomery Ward and J.C. Penney spent years stuck in the middle. Then, Wal-Mart and Nordstrom surrounded these leaders and they became stuck in the middle. In the business personal computer market, HP has become stuck in the middle between full service IBM and low cost Dell. A company that finds itself stuck in the middle must quickly search out a differentiation strategy that suits its capabilities. Since fundamental cost structures are very hard to change once a company matures, moving from a stuck position to cost leader is difficult but not impossible. Since, in technology, the fundamental cost structure is often rooted in salary costs, moving to low cost may require significant layoffs, reorganizations and shutdowns.

Revenues, Expenses and Strategy

Just as a new technology must satisfy its users and customers, a new business must satisfy its investors. Beyond the compelling strategy and vision that are needed to create investment momentum for the company, the cold investor expects some hard return. Operationally, that return reduces down to a clear understanding of what the revenue and expense streams will look like for the business.²⁵ While it's possible to create a "new" business model, most businesses are variations on existing business models. The illusion of the internet boom and bust was that all the old business models were obsolete and new companies didn't need to define any clear revenue and expense streams. In the end, most surviving internet companies are simply productivity improvements on earlier business

24 Pursuing a niche strategy is sometimes viewed negatively as if it means not being grand or successful enough. However, niches can be highly profitable and can be sustainable over long periods of time.

25 This book is not a treatise on accounting so the nuances between capital investment, depreciation and expense are not covered here. All are lumped together as expense

models like mail order sales. The on-line auction house (e.g., eBay) is arguably one of the few new business models that emerged from the web explosion. Portals and search engines (e.g., Yahoo and Google) are also arguably new. In both cases, it's impossible to state categorically whether the business model is "new." While in the Web boom, business models were intentionally left ambiguous, the survivors now can clearly describe their businesses. In eBay's case:

*eBay's principle business is hosting a global online auction web site for the eBay community. Anyone can register and sell merchandise and anyone can purchase merchandise. eBay derives its revenues from transaction commissions charged on each sale. Its principle expenses are the staff, software and equipment to create and manage the online action business. It also generates transaction revenue from complementary businesses like PayPal that provide a trusted credit card clearinghouse function to protect buyers and sellers.*²⁶

This business model is short, sweet and captures the essence of eBay's business. It is not a mission statement; it is a statement of how money is made. In any reasonably large business, no single statement can capture every source of revenue and expense but it is useful to describe the mainline business model and compare that to the business models being proposed for smaller and ancillary businesses within the same company. Businesses that are not complementary and have different business models than the core business struggle to survive in large companies. We'll discuss this further in the final section of this book. In eBay's case, PayPal is both complementary and shares a similar transaction oriented business model. eBay's recent purchase of Skype, a Voice over IP service provider, will provide an interesting study into eBay's ability to turn an unrelated business and business model into something closer to the main business.

There are countless business models even within the technology business arena.²⁷ Figure 20 gives some of the more common types.

26 For a more complete and accurate description of eBay's business see their 2005 annual report.

27 The creation of new ways of making money has been an area of innovation since the origins of the human race.

Business Model	Qualitative Characteristics	Quantitative Characteristics	Examples
Product	Create a single or multiple products and sell them directly or indirectly to users.	Revenue: Units times Volume. Expenses: unit cost of goods, service and support, R&D, marketing & sales	Intel, Samsung
Traditional Software	Develop software; sell on a licensed basis directly or indirectly to users.	Revenue: licenses and support/maintenance. Expenses: R&D, support, marketing & sales	Microsoft, Oracle
Open Source Software	Participate in open source development community. Sell support services for distributions of software.	Revenue: support services. Expenses: R&D, support, marketing & sales	RedHat, Montevista
Professional Services	Provide contracted labor to deliver on specific projects.	Revenue: services fees. Expenses: labor costs	Accenture, IBM Global Services
Systems	Combination of product, software and services business. Sell an integrated solution for specific systems problems.	Revenue: product, software, services. Expenses: unit costs, R&D, support, marketing & sales	Cisco, HP
Broker	Act as an intermediary between sellers of products, software and systems and purchaser/users.	Revenue: transaction fees, financing, support services. Expenses: Inventory, financing.	eBay, BestBuy
Network Service Provider	Provide a connection or content service to users.	Revenue: usage and subscription fees, advertising. Expenses: Network infrastructure and operations, marketing and sales	Google, Verizon, iTunes, AOL
Technology Development (Sustained)	Develop technology intellectual property and license to other businesses.	Revenue: technology licenses Expenses: R&D	Qualcomm, drug research firms
Technology Development (Start-up)	Develop and prove technology, and be acquired by larger firm.	Revenue: none Expenses: R&D	Mostly smaller firms

Figure 20. Business Models

A full blown business model definition, of course, is much deeper and includes:

- *The value chain definition as described earlier in the “The Value Chain”*
- *Current and target customers*
- *Current and planned product scope*
- *Sources of competitive advantage and strategies to maintain those advantages.*
- *Geographic reach*
- *Critical competencies, knowledge and relationships in sales, marketing, development and manufacturing*
- *Any major dependencies on government regulations, sources of supply or key customers*

For the strategy team, the business model can drive the choice of strategy. In most cases, creation of a new-to-the-world or new-to-the-company business model adds risk. The path of least resistance (and therefore most likely success) is to adopt the business model of the parent company or, in the case of a start-up, a straightforward business model that the financier is comfortable with. Occasionally, a Netscape or eBay will develop something new and unique but most companies select a proven business model. Within large companies, selecting a business model that diverges from the main business model of the company is usually disastrous. The company's well developed sales, distribution, planning and marketing systems have great difficulty digesting something that doesn't fit.

Product Strategy

Since many technology companies focus heavily on the continuous creation, launch and marketing of new products, product strategy requires some special attention in any discussion of company strategy. As we discussed in Technology Adoption, the selection of which new product to launch is fraught with peril. Sustaining innovations, those that improve the performance of existing products along a well established dimension for existing customers are relatively safe at least while customers still need performance improvement. Disruptive innovations require more thought and risk taking. Often the decision to invest in a new disruptive product requires a thoughtful “leap of faith” into the unknown by a visionary leader. Remember that new product risks compound. Risk goes up substantially for each of:

- New to the company technology — have we ever done this before?
- New to the world technology — has anyone ever done this before?
- New to the company customers — do we know anyone who wants this?
- New to the world market — does this market even exist yet?
- New to the company distribution channels — do we need to deliver this in a different way?

It's extremely rare for a product to succeed if it must overcome all of these barriers. Even the celebrated Apple iPod and iTunes success was tempered by the fact that MP3 technology was well known,

file sharing was proven by Napster and the iPod itself appealed to Apple Macintosh demographics.

Once the company decides to produce a given product, engineering and marketing tend to rapidly focus on the product features, performance measures, cost and price. What sometimes is forgotten is the surrounding support details required to make the product a success. Kotler [103] introduced the “Four P’s” of marketing to capture this surround:

- **Product.** The actual details of the product itself including features, performance characteristics and “look and feel.”
- **Price.** The price set by the company for the product including discount structure and packaging and featuring options.
- **Place.** The distribution structure for the product including channel partners, sales and support infrastructure and any retail distribution model.
- **Promotion.** The sales and marketing tools used to get the attention of customers and drive purchase including special discounts and price promotions, samples, sales collateral, press releases and advertising.

Having a clear plan to address these specific factors for any new product is critical. For most products, especially high tech products, it’s insufficient. Moore [15] introduced the concept of the “Whole Product” (see Figure 21) to capture other product surround attributes that may be important for a given product. The whole product includes the four P’s plus other products and services necessary for a user to effectively use the product. Moore asserts that no product can reach mass adoption by the mainstream market unless a whole product exists. Completing the whole product for a specific “beachhead” application is essential to crossing the chasm and each new bowling pin application may need additional complementors to complete its whole product.

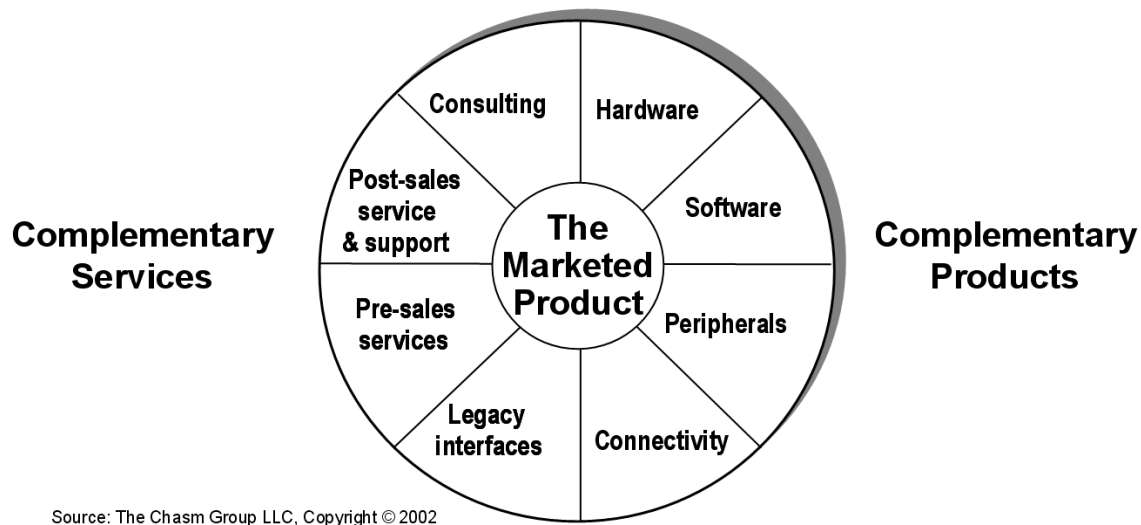


Figure 21. The Whole Product

For a company with a broad line of products, knowing which ones to invest in, which to simply sustain and which to discontinue becomes an important on-going strategy process that must be revisited at least annually. There are several available tools for *product portfolio management*. A common one from the Boston Consulting Group is shown in Figure 22. This model trades off segment share and market growth to formulate portfolio strategy. Other factors to consider are product cycle time, age of the portfolio, relative technology risk, and similarity and overlap with existing products. As we discussed in Technology Adoption, a technology company should not play it too safe – it will lead to obsolescence and decline. But, too many risky bets can exhaust the resources of the company and divert effort away from the business of making near term profit. Most product strategists settle on a mix of investments across the spectrum to balance short and long term needs.

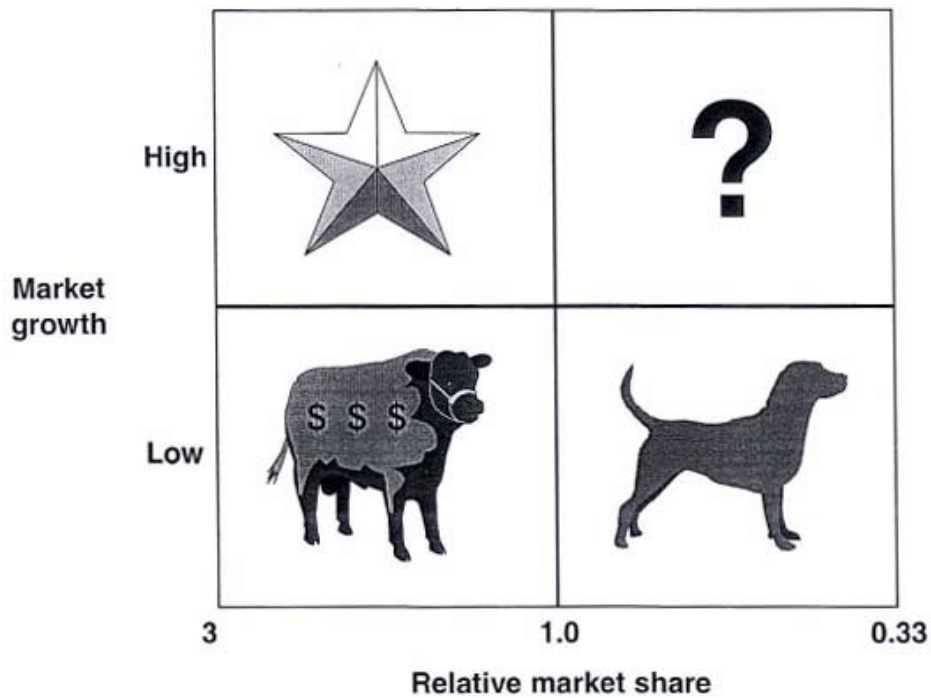


Figure 22. BCG Portfolio Management Model

What Route to Take? Options Analysis

The strategy team now needs to make some choices. Whether the new strategy is focused on the business model, market, technology development or product introduction, narrowing the options down to one and then beginning the execution is necessary for the exercise to have any meaning. Deciding what to do can be an analytic process based on a discussion of the options or it can be an intuitive leap of faith based on a sound understanding of the market and technology. Gladwell [32] provides a nice overview of the intuitive approach. In this section we'll talk more about the analytic approach.

Game theory, an analytic framework that provides a tool for evaluating interactions between players

will over time, is an essential grounding for good strategic thinking. While game theory isn't often used directly for business decision making, strategic games provide a way of thinking that guides decisions toward those strategies that can succeed. For an introduction to game theory, take a look at [30] or [31].

A simpler but essential tool for deciding on a course is option analysis.²⁸ Option analysis is used frequently in both business contexts and in systems architecture analysis. Its simplicity belies its power and it is amazing that it is not used universally by decision makers. The process is:

- Define the problem statement. (The problem statement from your scenario planning exercise is fine.)
- List the options that you have for addressing the problem statement. Note that “doing nothing” is always an option and is useful to list and analyze as a specific option if only to illustrate the risks of inaction.
- Discuss and document the pros and cons and the likely outcomes of each option separately.
- Pick an option. Use whatever decision making style is appropriate for the situation and the company culture. The common styles are:
 - *Authoritative. The boss decides. Everyone else lines up.*
 - *Consensus. The group decides. Everyone must agree.*
 - *Consultative. Everyone provides their views to the boss (usually both publicly and privately). The boss decides.*
 - *De Facto. No one decides. Whatever happens, happens.*

This last approach is decision making by omission. Without making an explicit decision (even if that decision is to do nothing), one of two things will happen:

- The “Do Nothing” option is selected by default.
- Each person in the organization will decide independently to pursue their own favorite option.

Neither of these alternatives is likely to create optimal results for the organization. Making an explicit decision and validating the commitment of all members of the team to that option is a critical step in strategy implementation and creates the transition point to implementation. It is not necessary that everyone agree that the option suggested is the best option for the company. It is necessary that they all commit to work toward implementing that option regardless of any disagreement they may have with it. Dissenters should not be allowed to resist the strategy either passively or actively.

28 This tool is not to be confused with financial options analysis, the process for determining the price of a financial option.

Loading the Car — Strategy Ratification

All the grand thinking and planning to this point has been an academic exercise for the strategy team. Success will come only when the entire company understands and supports the strategy. Of course, the CEO must agree and the senior management team should express support. The rest of the organization will provide varying degrees of support but should at least understand and be given opportunities to provide feedback and express concerns. But, first, they must hear about it.

There are likely to be three stages to aligning the organization around a strategy. The first, as above, is aligning the strategy team around a specific option. Given active participation and discussion within the team, this stage should be the easiest to successfully complete. Usually, a team that has the shared perspective of the analysis and scenario planning steps will have a consensus view of the right option.

The second stage is aligning the rest of the executive team with the strategy. This stage can take concerted effort in the form of public and private discussions with the executive team to share the thinking behind the strategy and to address concerns and issues raised. This stage of the process can take weeks or even months and strategies can often die an early death if key players can not be aligned. It's important that the top decision maker (the CEO or general manager) be aligned to the strategy and be willing to lobby for that strategy with the rest of the senior staff. They will look for cues from the leader before they will follow a strategy.

The final stage is aligning the broad organization with the strategy. This step often comes after more detailed implementation planning (as we'll discuss in the next section). The "troops" want to hear specifics about how the new strategy will impact them and their day to day roles and responsibilities.

In each of these stages, don't expect immediate universal buy-in and follow-up action from the stakeholders. In most cases, when a strategy requires change, multiple exposures to the strategy material (analysis, synthesis and action plan) will be needed to gain understanding and commitment. Be prepared to evangelize and over-communicate. Be clear and concise with the background information and the strategy — there's no need to dazzle them with your brilliance. It's much more important that they understand the logic and the imperatives they need to implement. Don't talk down to your audience. Yes, after going through this strategy process, you probably understand the subject better than your audience. But, condescension is a quick way to lose people's willingness to follow.

Although ratification by the executive team launches the next phase of action, the communication effort will continue as the implementation progresses. After the second introduction to a grand vision statement, though, the audience's eyes will glaze over. Each communication beyond the first should introduce new material in the form of education on competitors or other topics, reviews of action plans, success stories or other indicators of progress.

Making the Trip — Action

After the heady phase of strategy creation, the strategy team may have trouble mustering enthusiasm for planning the actions required to implement the strategy. After the intellectual stimulation that goes with the first two phases, the more mundane tasks like developing new sales team incentives may seem boring. The skills or organizational role of the strategy team may also not quite match those needed to turn strategy into action. And, most critically, for any strategy that is substantially new, the organizational resistance may be high. However, the strategy team can not abdicate responsibility for making the strategy real. No one in the organization understands the new strategy as well as the strategy team and no one, presumably, feels the imperative to action as well.

Moving from strategy to action is the most critical step in the strategy process and the most difficult. Failure to take action means the strategy exercise was futile and the company is defaulting to the “do nothing” option. To start the actions happening:

- Reform the strategy team, adding new members who can implement action. Assure that the new team members are well informed on the strategy and the background behind it. Don't let key members of the initial strategy team fade away. Their leadership and knowledge is still needed.
- Using the tools we'll talk about below, begin implementing some of the most important changes. Don't over plan or “send issues to committee”. Begin experimenting. You're sure to make some mistakes and learn from them. As long as the mistakes are steps on the way to the end strategy, none are lost. Inaction is the biggest killer of strategy.
- Look for quick wins and quick lessons that can help assess progress, create enthusiasm for the strategy and provide valuable market insight into whether you're on the right track. Publicize in the company both the successes and failures. It's as important to show commitment through the failures as to have the validation of the successes.
- Stick with it and make course corrections. Most new strategies take multiple years to implement and evolve significantly over that time. The “Strategy of the Year” loses credibility quickly in the organization but rigid adherence to a singular path when the market is forcing you a different way is also foolish.

Tools for Implementation

Like any other business activity, strategy implementation makes use of the few tools that managers have to implement any idea. The tool set here is deceptively simple and leaves out some of the more specific tools like intellectual property licensing and corporate acquisitions. But, if faithfully and thoughtfully applied, these tools will lead to the best results possible for any given strategy.

People

The single most important tool for implementing a new strategy is assigning the right people and enough people to make the strategy work. The executive team must find a few key people with knowl-

edge, ability and enthusiasm to lead the new strategy implementation without marginalizing it into an obscure corner of the company. The leaders of the mainline organizations must also have a stake in the implementation by providing resources or some form of support. Not everyone needs to be assigned at once to the implementation program but it must be clear that, as the implementation progresses, everyone will be expected to contribute to its success, not just the early seed team.

It's tempting to bring the leader of the strategy implementation in from outside the company. An outsider is presumed to bring fresh ideas and relevant knowledge to the problem. Usually, however, a star insider, especially a somewhat rebellious insider, will be more successful. An insider knows the people, competencies, barriers, and concerns much better than an outsider will. Much less time will be wasted with the right insider leader.

There is no perfect way to select the implementation leaders but finding the right leadership will make or break the success of the pioneer phase. A proven leadership combination for these activities is the driver/doer leader paired tightly with an organizing strategic leader. This pairing will only work if the two leaders respect each other and find a complementary working arrangement. In Myers-Briggs personality typing, this combo is often the "Executive – ENTJ" paired with the "Scientist – INTJ" [33] Of course, other pairings and solo leadership will work but finding the right mix of styles for the pioneer phase is different than for the later mainstream phases.

The implementation leaders need to have access to key technical, marketing and operations resources. This access has to be more than just the ability to consult with people. They are likely to need to have prototypes built, analyses conducted and concepts tested with customers. The leaders can not do everything themselves. Starving the implementation team of people is also an indication of lack of commitment to the strategy and sends the wrong message to the organization. Putting too many people on too soon is also a problem as it creates confusion, lack of focus and can raise expectations.

It's impossible to put a number on the right size for the initial implementation team. Since you trust the implementation team leader, the most straightforward approach is to allow him or her to propose the set of resources required and to assign eighty to ninety percent of what the leader requests. Hold back some to keep the leader hungry for more but create clear expectations as to what will cause the rest of the resources to be applied. Allow the team leads as much freedom to hire who they want and need as is practical. Hiring from outside and attracting key players from other organizations should be encouraged not obstructed. To implement a new strategy, some of the old strategy must die off and that means moving resources to the new.

Money

Second to people, giving the implementation team a dedicated expense and capital budget is a high priority. Nothing as important as driving a new strategy can be done without some level of financial resource. The implementation team will need to spend money on R&D for early prototypes, making changes in operational infrastructure, investing in market research and providing sales team incentives to do things differently than they have before. Again, getting a budget estimate from the implementation team, slightly reducing it and providing tranches of funding when the team achieves implementation milestones is a proven venture capital method. Once given a budget, the team should have flexibility to make adjustments in how they use it. While good business practice requires financial

control, strategy implementation is somewhat uncertain and too much rigidity will get in the way.

Structure

Choosing the appropriate organizational structure is an important decision in strategy implementation. An organization change signals to the organization a change in the status quo and demonstrates a commitment to the strategy; this signal is so important that an organization change of some sort is almost mandatory. However, a wholesale reorganization early in the implementation will be both disruptive to on-going operations and will diffuse the focus on strategy implementation.

Most effective strategy implementations use two or more reorganizations on the way to implementing strategy. The first organization structure can be thought of as the “pioneer” or “incubation” organization. In this phase, the implementation team is given significant autonomy from the rest of the organizational structure to execute and make mistakes. This structure will create tension and conflict between the “business as usual” structure and the “pioneer” structure. It’s the senior executives’ jobs to mediate, remind the conflicting organizations that the conflicts are natural and not personal.²⁹ The business as usual organization, controlling as it does the bulk of the resources of the company, must be encouraged to support the pioneer team even though direct accountability for strategy implementation resides in the pioneer team. The pioneer team must be careful not to unnecessarily disrupt the business, especially sales and customer relationships, during the implementation. Success in this phase means that the strategy has been validated in the market place, the new business model has been tested or that the technology is sufficiently developed to drive a full product implementation. The pioneer phase can last anywhere from three months to two or three years. Burgelman gives more guidance on structural options for the pioneer phase.

The second reorganization brings the pioneer organization into the mainstream. Depending on the significance of the change, this reorganization may be a simple absorption by the mainline organization. Each functional organization picks up functional responsibility for completing the strategy implementation. In other cases, the new strategy has such a significant impact on the company that a wholesale reorganization may be required. The wholesale reorganization has two purposes: to create a more optimal operational structure for the new strategy and to signal to the organization that things have really changed and the status quo is no longer adequate.

The most difficult part of this process is the transition from the pioneering organization to the mainstream organization. The executive team must time the transition correctly and keep from losing momentum as the transition takes place. If the transition is made too soon, the immature implementation will be crushed by the weight of the larger structure. If it is made too late, the pioneering team will be unable to keep up with the demands of scaling the strategy. The pioneering implementation team needs to have an explicit plan for engaging and training the mainstream organization to pick up the implementation as it matures. So, for example, in a new product introduction, technical support and sales should be trained as early as possible even though in the early phases, product engineering and

29 Unfortunately, personal jealousies can be significant in these structures. Those left behind in the run rate business may feel passed over for the plum strategy implementation jobs. Those in the pioneer team may feel marginalized and not part of the mainstream business.

marketing may handle most of the duties. And, the product engineering and marketing teams must handle the training directly; the normal training organization is not yet ready to take this on.

Aside from timing, the leadership transfer is the next biggest threat to momentum. As the strategy scales, the pioneering leaders need to willingly give up some autonomy in order to fit into the larger company structure. At the same time, they may rightly feel that it is part of their job to drive the larger organization to do things differently than they have in the past. Also, since any given individual often has skills and a temperament best suited to either pioneering or on-going management, the pioneering leaders may be a poor fit for managing a more mainstream organization. In some cases the pioneers may recognize this skill gap and willingly move on to other things. In other cases, they may be very dedicated to the project or view it as their path to advancement and are unwilling to let go. Meanwhile, the mainstream organization has to gently receive the incoming strategy, figure out how to scale it in their organizations without massively disrupting on-going business. And, any pent up jealousies or unresolved conflicts between the pioneers and the mainstream organization exacerbate the issues. Since these transitions often reach high up into the management chain, the CEO may be the only one who can effectively mediate this transition. His or her only tools to mediate are keeping the team focused on the larger goals, individually appropriate rewards and incentives (more below) and strong interpersonal skills. A weak performance by the CEO at this stage will doom the strategy.

The example of Meriwether Lewis gives insight into the difficulties of rewarding pioneers. After returning from exemplary leadership of the extraordinarily successful Corps of Discovery in its pioneering transcontinental American exploration, Lewis was "rewarded" by Thomas Jefferson with the governorship of the Louisiana Territory. Within three years, enmeshed in business intrigues, administrative trivia, and scandal over his expense reports and, one imagines, despondent with loss of purpose and glory, Lewis committed suicide. [34]

Process

Teams and individuals get things done by executing a process. The process for some things may be as simple as:

- Create a presentation
- Visit three customers
- Report the results to the team

Or, it can be as complicated as a process defined by total quality management (TQM), process quality management and improvement (PQMI) and other business process improvement and operations research techniques. Regardless of how heavy or light the process is, there is a process, even if it is the "chaos process":

- Everyone talks a lot.
- Some people do some disconnected things.
- Other people talk some more but do nothing.
- Everyone responds to periodic fire drills.

- At the last minute, the team pulls together a presentation for the executive review.
- Repeat.

Better to have a defined process that will drive progress and results in a measurable way. At its essence, a minimally defined process has the following components:

- **A set of goals and objectives for the implementation project.** Goals should be long term (two to three years). Objectives should be intermediate term (six to twelve months). All should be festooned with minimum “fluff.” If they can’t be articulated clearly, then they are worth nothing.
- **A set of tangible deliverables or outputs that the process should produce.** Deliverables include both final outputs and intermediate outputs to drive and measure progress. A deliverable can be a document, a proof of concept, a reviewed plan, an approved budget, a demonstration at a trade show, a customer contract or some other tangible output.
- **A timeline for the creation of the deliverables.** The dates for delivery of outputs must be clear and committed to by the producers of those outputs. Because implementation of a new strategy may not have an external driver of progress, a sense of “date urgency” is needed to create a project pacing. A significant deliverable should be scheduled for every three to six months.
- **Defined team roles and responsibilities.** Each deliverable should have a singular owner and a set of contributing stakeholders. In rare cases, a deliverable can have dual owners when it’s needed to assure organizational buy-in to the output. More than two owners creates diffused accountability.
- **A set of success measures.** To prevent myopic focus on tactical deliverables, the team should have a set of measurable end goals that drive the right behavior in the process. These measures could be something like number of customer contracts signed or a certain tested quality level for a new product. In cases where no objective criteria are obvious things like a “score of B or better by the executive management team at our Q1 project review” need to be concocted.
- **A schedule of management review meetings.** These reviews can be calendar driven (e.g., quarterly) or event driven (e.g., when a specific document is completed). If events begin slipping, however, schedule a management review to understand why the slippage is happening.

Many strong process companies use a “gate process” for the creation and introduction of new technology, programs and products. Each gate consists of a set of deliverables produced to reach the gate and a review meeting to determine whether or not the criteria have been met to pass the gate. Often, companies implement this process to support new product introduction but it is easily extensible to support other types of programs. A gate process usually has the same rough milestones:

- **Concept Gate.** At this gate, the basic idea, its business value, expected costs, issues and risks are laid out for an executive management review team. For strategy implementations, the strategy review can easily serve as the concept gate.
- **Investment Gate.** At this gate, the overall budget, deliverables and timeline for the program are approved and planning staff is assigned. A detailed document describing the program, why it is being pursued and what the outputs are should be described. In a start up company, the investment gate would typically be when venture funding is applied. A detailed business plan is the

main deliverable to the gate.

- **Plan Gate.** At this gate, detailed project plans with interlocking dependencies, a realistic timeline and committed project resources are locked down. From, this gate forward, the rest is execution.
- **Launch Gate.** At this gate, the project deliverables have been completed and are ready for external launch if applicable. All pre-launch success indicators (e.g., quality levels, customer engagements, documentation completed, etc.) should be met. The party is held.
- **Project Close-Out Gate.** At a reasonable time after the launch (e.g., 3 to 6 months), some companies hold a close out gate to mark the formal end of the program and assure that no customer complaints, quality problems or other major issues are arising.

Other gates can be devised as needed to best reflect the type of work being done. The critical parts of the gate definitions are the deliverables required to pass the gate, the quality levels for those deliverables, the decision makers for the gate review and the process for resolving issues after the gate review. Some issues raised may stop further progress until the issue is resolved. Others may simply be issues to be worked in preparation for the next gate. The gate reviews should disposition each issue raised into these two categories before the end of the review.

In some companies, lack of process is less an issue than too much process. When starting something new, placing too high a bar in front of decision making will delay and demoralize the implementation team. In processes that require significant detailed planning and data analysis to move forward, a plan to develop a radically new technology or attack a new market will stall. Choosing sufficient process without unnecessary burdening is a balancing act.

Systems

Systems are the information management systems and practices that are used to get a given job done. Systems include data repositories, collaboration tools, reports, review meetings, advisory boards, order management, human resource management, budgeting, CAD/CAM systems, manufacturing systems and other formal and informal tools used in the operation.

Implementing a new strategy may require the creation of new systems. Minimally, the implementation team needs a progress review body who will check the team's progress and offer assistance, advice and encouragement. This body may be an existing body or may be specially constituted for the implementation team. In addition, a periodic dashboard or "balanced scorecard" [35] should be created so that progress can easily be reported. New information systems or enhancements to existing systems may also be necessary to implement a new strategy. As anyone who's experienced a major new systems roll out will attest, implementing a new system is expensive, time consuming and frustrating. Plan early and focus heavily on execution if new information systems are needed.

The difficulty of changing systems highlights an often overlooked issue with implementing a new strategy. A company's systems and processes are an embodiment of its business model and strategy. A hardware company develops one set of systems. A software company develops a different set. An open source software company will be very different from a traditional license fee oriented software company. Often, what strategy implementers believe is organizational resistance based on recalcitrant "legacy" culture is in fact the inability of the existing systems to absorb the new strategy. Customer

service in a hardware company may not know how to take an order for software. The legal department may never have negotiated a software license. Systems for distribution of bug fixes and product upgrades may not exist.

Sometimes the systems themselves create the strategy. A classic example is Intel's shift from a semiconductor memory focus to a microprocessor focus [5], [10]. Intel's factory capacity allocation systems were created to give products with higher product margins a higher priority in the access to manufacturing slots. Because microprocessors had much higher margins than memory, as volume grew, microprocessors began to preempt memory in factories. Memory orders went into backlog while microprocessor orders were filled. Customers moved their memory orders elsewhere and, soon, Intel was a microprocessor company. Not until this transition was all but done did executive management announce Intel's "new strategy" as a microprocessor company.

This example points out the close link between systems and measures and objectives. Intel's systems were set up to maximize a specific measure: product margin. For better or worse, the old saw, "you get what you measure" is a reality in most companies.

Objectives and Measures

As with systems, implementation of a new strategy requires a deep understanding of both existing and future measures and objectives. The simple approach to understanding what measures are important is to ask: "what measures impact this person's performance review? For what result will they be rewarded? What missed result would cause them to be fired?" The answers to these questions are at the heart of understanding who will actively support the strategy implementation, who will offer "pro bono" assistance, who will passively ignore it and who will actively oppose it.

Unfortunately, for most "new" things, especially during the pioneer phase, those with the greatest access to the resources to implement it have the most incentive to either ignore it or oppose it. As an example, in technology markets, customers are typically anxiously awaiting delivery of new products that they have been promised. As a result, the engineering vice president is usually measured on delivery of committed products with quality and on time. That means that engineering VPs are generally driven to focus most energy on those product development activities directly related to products already committed and to oppose adding new products (especially highly speculative ones) to a generally overloaded development organization. So, the controller of the precious engineering talent required to realize the new strategy is systemically incented to block it. Similarly, sales organizations are usually measured on this quarter's revenue. Product marketing is measured on revenue and margin. Support is measured on customer responsiveness metrics. When a "new strategy implementation" measure is added as an afterthought, it often falls to the bottom of the list. People generally know which objectives they'll be fired for failing to meet.

Setting up the "pioneer organization" and measuring its leaders solely on the new strategy implementation is the short term solution. However, there are two critical aspects to making this successful.

First, the pioneer organization objectives must meet the “SMART” criteria. They must be:

- Specific — Objectives should specify what they want to achieve.
- **Measurable** — You should be able to measure whether you are meeting the objectives or not.
- **Achievable** — Are the objectives you set, achievable and attainable?
- **Realistic** — Can you realistically achieve the objectives with the resources you have?
- **Time** — When do you want to achieve the set objectives?

Achievable and realistic objectives require resources and autonomy. The pioneer team, as discussed above, can not be so starved for precious resources that they can't accomplish their objectives. And, if the rest of the organization is still pursuing their day jobs, the pioneer team must be free of the constraints imposed by the objectives, systems and processes of the mainstream organization.

Second, when the time comes to transition to the mainstream organization, the objectives for both the pioneer team and the mainstream organization must explicitly enable the transition. The pioneers must pass the ball and the mainstream team must catch it. To make a new product hand-off to sales, for example, the pioneers will have to train the sales staff to sell the product. The sales organization needs to attend the training and have part of their compensation package tied to sales of the new product.

External Partnerships and Relationships

Rather than rely solely on resources within the company, new strategy implementations often benefit from using partnership with new or existing partners. A partner in this context can be a customer, supplier, complementor, channel member, standards body, trade association, regulatory body, analyst or industry leader. Sometimes partners in new areas are competitors in old. These partnerships can add:

- Sharing the burden of developing a new technology
- Establishing a strong success story/reference account for a new product or technology
- Bringing specific knowledge, skills, technologies and expertise to the company
- Creating market and industry credibility for the initiative
- Assuring that a required complementary product is available in the market
- Driving standardization to increase the market opportunity for all
- Increasing the number of potential customers that can be reached with the new technology
- Increasing the perceived market relevance of the company, its initiative and products

Goals and objectives like these should be made specific as early as possible in the partner engagement. A partnership will not yield any tangible fruit unless the goals are clear and are aligned across the partnering organizations. Working together as separate companies introduces overhead for the people who must interact across the boundary. Unless there is mutual benefit and commitment within the companies to absorb this additional overhead, the relationship will wither after the agreement is signed.

Partnerships go through stages as they mature:

- **Discovery** — Are we interested in working together? Concludes with the commitment to negotiate a relationship agreement.
- **Development** — What sort of relationship should we have? Concludes with the signing of the relationship agreement.
- **Formation** — How do we staff and implement the agreement? Concludes when the relationship team is in place.
- **Execution** — Let's do it! Concludes when the deliverables outlined in the relationship agreement are completed.
- **Close-out/Institutionalization** — Are we done? Concludes when the relationship has served its purpose and terminates or becomes part of on-going operations.

There are many contractual methods that companies use to implement partnership engagements. The principle ones are:

- **Informal** — The companies undertake some joint activities like marketing collateral, information sharing and on-going discussion without a formal agreement.
- **Standard Supply** — One company supplies the other with products and services.
- **Strategic Supply** — One company supplies the other with products and services and the companies undertake special activities like supply chain integration or volume purchase agreements.
- **Co-Marketing** — Two companies produce joint collateral, attend trade shows together and co-brand products.
- **Co-Selling** — Two companies' sales teams participate in the same sales calls.
- **Channel** — One company agrees to distribute another's products and services.
- **Ecosystem Enabling** — One company provides incentives for another company to undertake something it might not otherwise have undertaken to advance the interests of the first. For example, a large company may fund a small company to make modifications to its product to make it more complementary to the large company's products.
- **Joint Development** — Two or more companies work together to create a technology or product.
- **Joint Venture** — Two or more companies form and fund another semi-independent company to undertake new commercial activities.
- **Trade Association** — Several companies band together to promote common industry interests. These activities are often marketing and promotional activities that are in the common interest but no one company would fund separately.
- **Standards Body** — Several companies and entities work together to create standards specifications for adoption by the industry.

While this list isn't exhaustive, and it's possible to create variants, these options will cover most cases.

Incentives

The last major tool for implementation of a new strategy is the incentive package used to motivate individuals in the organization to make the strategy real. Without proper incentives, the company relies on the good will of its employees to do things that may be counter to the normal operating mode and may not be in the financial or career best interests of the individual. The incentives need to be adjusted based on the phase of the implementation and the role of the individual.

In the early phases, the pioneer team needs an incentive to take the career risk associated with being a pioneer. Aside from personal belief and commitment, why would a rational senior leader step up to drive a pioneering effort if there were no explicit reward? Incentives for leaders at this phase often take the form of higher visibility in the company, a promotion into the leadership role, a chance to have some fun and do something new and the promise of a bigger reward at the end of the process. For the mainstream organization, the main task is to remove disincentives for assisting the strategy team. Allow some relief from revenue goals to assist with the strategy. Kill an existing product to free up resources. Make sure that when this relief is given, that the corresponding support does go to the new strategy.

At the hand-off, the pioneer organization needs to be rewarded for their efforts. Simply getting to hand-off will be the greatest accomplishment they will achieve. Rewards shouldn't be withheld simply because the final roll-out has not happened. The first sale of a new product is far more important and difficult than the sale that drives revenue from \$20m to \$30m. A significant reward also sends a message to the mainstream organization that the strategy is important and the implementation is on the right track. It also prods would-be leaders in the rest of the organization to step up to future challenges.

Determining the nature of the reward is difficult. Often, the reward is increased responsibility in the mainstream organization, either a key role in the on-going implementation or some other unrelated but significant job. There are, unfortunately, a number of potential fatal flaws with this approach.

- The pioneers may not be competent for the new role or may not have any personal affinity for the type of work involved. Blinded by ambition and the recognition that the reward implies, they will take it only to fail and be miserable. Remember the Meriwether Lewis example.
- The role needs to be significant within the organization. Finding an important role that isn't already filled means displacing someone, reorganizing the mainstream organization so that everyone has a new role (and thereby devaluing the reward for the pioneer) or creating an overlay, marginal role that really has no significant responsibility. Since this last option is the easiest and avoids the potential risk of incompetence, it's the one often chosen but it's hardly a reward, is usually viewed as a joke and indicates to the organization that there's no real payoff for pioneering.
- The chemistry between the pioneers and the mainstream organization is often shaky. This tension arises from both past conflicts and personality differences. The clash of the old and the new and the clash of egos between those who understand deeply the old and those who understand deeply the new all lead to dissension and conflict. The teamwork between the senior team can be disrupted at the critical handoff.

In many cases, the example of the venture capital process provides a better solution. For many founding entrepreneurs, the most effective rewards are a large financial payout, significant public recognition and the opportunity to become a pioneer again. For some reason, corporations have been slow to implement these types of rewards. This reticence may contribute to the better track record of innovation in venture funded companies.

Incenting the mainstream organization to pick up the strategy implementation is equally difficult. Without a complete reset in roles, responsibilities and objectives, incentives become one of the few ways to motivate behavior change among people who still need to make sure that the existing business keeps running. Public recognition of programs that implement the new strategy, special bonuses for leading an initiative and the addition of new metrics and rewards based on achieving those metrics are a few approaches that can motivate people to take on more work.

Closely related to incentives is the annual performance review process that many companies use to manage employee salaries, careers and performance. In any new strategy implementation, it's important that the performance review process give extra weight to the new to insure the process does not succumb to the inertia of the old.

Pulling It Together

Let's go back to our IP Video example and imagine how these tools would all come together. Suppose that after the scenario planning exercise and some discovery and internal ratification, the CEO decides that its time to begin pursuing the IP Video market. He charts the Strategic Marketing Director who has a personal passion for the technology to lead the business side of the initiative as the IP Video Marketing Director and recruits the current Software Design Director to work with him as the IP Video Engineering Director both reporting directly to him. The three agree to plan that looks like:

Structure	<i>R&D Director and Marketing Director reporting directly to the CEO</i>
Timeline	<i>18 Months until mainstream intercept begins. 36 months until it completes</i>
Resources	<i>\$10M in R&D budget; \$2M in Marketing budget per annum to be revisited annually. Requests for incremental "emergency" funding made no more than once every six months Carte Blanche to hire engineers and marketing resources internally or externally Seed of two key senior engineers with IP Video knowledge from the mainstream organization</i>

Objectives	<p><i>Beta product delivered to first customer</i></p> <p><i>Pipeline of 3 additional customers</i></p> <p><i>Product support team trained</i></p> <p><i>Sales teams trained</i></p>
Process and Systems	<p><i>Recommended use of standard company product development processes and tools, but team latitude to adapt those processes for start-up needs</i></p> <p><i>Required use of standard company expense reporting, ordering, manufacturing and support systems and processes</i></p> <p><i>Quarterly executive staff reviews of program progress</i></p> <p><i>Relief from other organizational reporting requirements</i></p>
External Partnerships	<p><i>Contract with Video Research Labs to license their state-of-the-art IP Video encoder</i></p>
Incentives	<p><i>Assuming success in achieving objectives, at the CEO's choice and after the transition plan is completed, the marketing director and R&D director will be rewarded with either a VP level position in the mainstream organization or a \$100,000 bonus and a major assignment on another start-up activity.</i></p> <p><i>All other members of the pioneer organization will receive cash bonuses of \$15,000 at the delivery of generally available Release 1 product. They will be slotted for the roles in the mainstream organization based on their individual performance as judged by the pioneer leaders.</i></p> <p><i>A budget of \$20,000 in spot bonuses of \$1000 maximum at the discretion of the pioneer leaders for members of the mainstream organization for assisting with the start-up activity.</i></p>
Expected Intercept Plan	<p><i>Beta of Release 1 will begin the transition to the mainstream organization (18 months). Expect transition to be complete at Release 2 of the product (36 months)</i></p> <p><i>Mainstream organization to assume full responsibility and absorb the resources of the pioneer organization during the transition period</i></p>

Let's imagine that everything goes according to plan and that at 18 months the objectives have been achieved. The CEO now must convene the pioneer leaders and the leaders of the mainstream organization to plan for the transition. The IP Video engineering director has demonstrated extraordinary ability in building his organization and at delivering the beta product. The engineering VP of the mainstream organization has informed the CEO that he plans to retire in two years. The marketing director has been relentless in creating opportunity for the new product but lacks maturity and has alienated many of his peers in the mainstream organization. The new plan looks like:

Structure	<p><i>Vice President of Engineering assigned as executive owner of the transition</i></p> <p><i>Pioneer leaders dotted line report to the engineering VP but still maintain direct reporting to CEO</i></p> <p><i>Full-time transition program manager assigned reporting directly to the engineering VP</i></p> <p><i>Quality Assurance team dotted line reports back to IP Video engineering director for product test</i></p>
Timeline	<i>18 months for transition plan completion</i>
Resources	<p><i>In addition to on-going budget as above, transition budget of \$2M to implement systems, training, sales collateral, and other needs</i></p> <p><i>Part time implementation owner assigned in each impacted functional area</i></p>
Objectives	<p><i>Product Release 1 delivered in three months</i></p> <p><i>Product Release 2 delivered in 18 months</i></p> <p><i>Product delivered to three additional customers before Release 2 product</i></p> <p><i>On-going sales, marketing and support in place by Release 2</i></p> <p><i>Expense control now shared between pioneer leaders and transition program manager</i></p>
Process and Systems	<p><i>Gradual integration with all standard company processes by Release 2</i></p> <p><i>Continuing quarterly executive reviews</i></p> <p><i>Monthly sales reviews to measure market traction</i></p>
External Partnerships	<i>Establish co-marketing and co-selling agreement with the company's largest OEM customer for IP Video products</i>
Incentives	<p><i>In recognition of mid-process success, the pioneer leaders are paid \$20,000 bonuses from the \$100,000 allocated. Each member of the pioneer team also receives a \$1000 bonus.</i></p> <p><i>The CEO signals to the IP Video engineering director that he is the prime candidate for replacing the engineering VP.</i></p> <p><i>The CEO begins discussing the market opportunity for handheld video players with the marketing director and signals that, assuming the transition goes well, the marketing director will receive the rest of the \$100,000 payout.</i></p>
Expected Closeout Plan	<p><i>All transition activities to be complete at Release 2</i></p> <p><i>All pioneer staffing transitioned to mainstream organization by Release 2</i></p>

Of course, things never go quite so smoothly but having a clearly thought through plan will go along way to reduce the inertia, conflict, delays and failures of new strategy roll-outs. In practice, the plan will need to cover many more issues than this example does but staying tangible and specific rather than abstract and vague makes a big difference. While this example is about creating a new product for a new market, the concepts are extensible to any other implementation of the new.

Timing Is Everything

Many strategies are victims of timing. Execute too early and much is invested before the technology and the market are ready for it. Execute too late and the opportunity is gone. Unfortunately, precise timing is impossible to achieve. Better to select a strategy, begin executing to it and monitor progress and level of investment to match the momentum and successes that the strategy is achieving. Brown and Eisenhardt [36] contend that the constant balancing on the edge of chaos between the unknown future and the comfortable present is the essence of modern competition. The important thing is to be engaged and active in leading change. Admit mistakes and move on but don't fall back on the status quo. Patience and staying power is needed. As we saw in Technology Adoption, mass market adoption of a new technology takes on average nine years and you don't make the real money unless you get to the mass market. While every strategy hits some implementation setbacks, continual failures could be an indicator of some fundamental flaw in the strategy. Napoleon summed up his battle strategy as "S'engagez et puis s'on voit" — "We engage and then we see." Adjust, tweak, revamp, retry during the fog of war. Allow the implementers to adjust to changing conditions while keeping the overall objectives in mind. The real world is not a chess game; it's messy and populated with flawed people who make mistakes and irrational decisions. None of these challenges should be an excuse for inaction.

Summary

Formation and implementation of good strategy is a combination of training, experience, strong intuition and a penchant for action as well as reflection. Using the tools we've covered in this book will help put structure and process into the strategy process. But, a book alone won't solve all the problems. Over reliance on academic and trade press advice can stymie the action needed to get something real done. Treat strategy like a customer order. It is something that must be executed on and fulfilled or you will go out of business. The frameworks described in this book are simply methods and procedures you can use to fulfill that order.

Strategy is not a black art. The tools presented in this book and others you can find on your own make it more of a science but, like project management, marketing and psychology, any practice that relies on people will never be purely scientific.

Everyone in a company plays a role in strategy formation and execution and should have exposure to the process and tools. They should participate in the processes used to create strategy and will always benefit from some knowledge of "how the sausage gets made." Having professional strategists lead the process is a great benefit but even hobbyists with a little training can accomplish great things.

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