

## Chapter One

# Spotting the Real Innovators

Take this quick test: Which firm is the innovator that brought us online bookselling in the 1990s? If your answer is Amazon.com, you are wrong. The idea for online bookselling—and the first online bookstore—came from Charles Stack, an Ohio-based bookseller, in 1991. Computer Literacy bookstore, a successful retail chain, also registered an Internet domain name in 1991. Amazon did not enter this market until 1995.

Another quiz: Which innovator came up with the idea for online brokerage services? If you answered Charles Schwab or E-Trade, again you are wrong. Two Chicago brokerage firms—Howe Barnes Investments and Security APL Inc.—launched the first Internet-based stock trading service, a joint venture called Net Investor, in January 1995. Schwab did not launch its Web trading service until March 1996.

Both examples highlight a simple point that is at the heart of this book: the individuals or companies that *create* radically new markets are not necessarily the ones that *scale* them up into big mass markets. Indeed, the evidence shows that in the majority of cases, the early pioneers of radically new markets are almost never the ones that scale up and conquer those markets (see Table 1.1). For the last twenty years, the Xerox Corporation has been derided for its inability to successfully commercialize scores of new products and technologies, notably including the now ubiquitous personal computer OS interface developed at its PARC research center in Northern California. In reality, Xerox's failure is more the norm than the exception!

**Table 1.1. Unsuccessful Pioneers of Radically New Technologies.**

<i>Pioneer</i>	<i>Technology</i>	<i>Year</i>
Robert W. Thompson	Pneumatic tire	1845
Thomas Saint, Walter Hunt, and others	Sewing machine	1790–1851
Stanley brothers, Colonel Pope, and others	Automobile	1897–1905
Henry Mill, Xavier Projean, and others	Typewriter	1714–1878
Valdemar Poulsen	Magnetic tape recorder	1899
Alexander Parkes and Daniel Spill	Artificial plastics	1866–69
Juan de la Cierva	Helicopter	1930
John Baird and Francis Jenkins	Television	1924
Frank Whittle	Jet engine	1930
Transitron, Philco, and Germanium Products	Transistor	1952–55
Biologicals	DNA synthesizing machine	1981

*Source:* Francisco-Javier Olleros, “Emerging Industries and the Burnout of Pioneers,” *Journal of Product Innovation Management*, March 1986, pp. 5–18. Reprinted with permission.

This may surprise people who have been brought up to believe in pioneering and first-mover advantages! However, there is no escaping the evidence. Henry Ford did not *create* the car market but the Ford company ended up capturing a lot of the value in that market in its first hundred years of existence; Procter & Gamble did not *create* the market for disposable diapers but it is P&G that ended up harvesting most of the value out of the mass market for disposable diapers that blossomed in the last fifty years; and General Electric did not *create* the CAT scanner market, yet it was GE that made most of the money out of this market. It turns out that when it comes to radical, new-to-the-world markets, the pioneers almost always lose out to latecomers.

This is a puzzle. The early pioneers tend to have the necessary technology and by definition enter the market much earlier than other firms. This should, in principle, give them first-mover advantages over any latecomer. Why then do they consistently lose out and surrender the markets that they create to other firms?

It's not because the pioneers are small or insignificant players with no resources or bad management. And it's not because their products are inferior to the products that latecomers introduce. Consider, for example, the market for personal digital assistants (PDAs). This market was created in 1993 when Apple Computers introduced its revolutionary handheld computer called Newton. Apple's CEO at the time, John Sculley, called it "nothing less than a revolution" and predicted that it would launch "the mother of all markets," with PDAs and similar gadgets constituting a trillion-dollar market.

Less than ten years later, PDA demand had grown into a billion-dollar market. While not as huge as predicted at the time of its creation, it had soared from zero to \$1 billion in ten years and had established itself as one of the new markets of the Internet era. Yet even a casual observer of this market at the turn of the century could not fail to notice that the company that could legitimately claim to have been the creator of this market—Apple Computers—was nowhere to be seen. Instead, all the spoils from the growth of the PDA market had gone to firms—such as HP and Palm—that followed Apple into it. It is hard to see why. Nobody could claim that Apple lost out to Palm because of lack of resources or lack of expertise. Nor could the Apple Newton be considered an obviously inferior product to the Palm Pilot.

Why then did Palm succeed where Apple failed? More generally, why is it that the firms that create radical new markets are rarely the ones that scale them up into mass markets? And what does the answer to this question imply for firms that aspire to create the markets of the future? We aim to answer these questions in this book. It turns out that there are specific reasons why pioneers

fail to scale up markets, and understanding these reasons will help you appreciate what the modern corporation needs to do if it wants to achieve radical innovation.

## Radical Innovations

It should be obvious from the examples that we have used so far that *this book is concerned with one specific type of innovation*—namely, *radical* innovation. By this we mean something concrete. Innovations are considered radical if they meet two conditions: first, they introduce major new value propositions that disrupt existing consumer habits and behaviors (for example, what on earth did our ancestors do in the evenings without television!); second, the markets that they create undermine the competences and complementary assets on which existing competitors have built their success.

Everyone knows that there are different kinds of innovations with different competitive effects. It is, therefore, important to appreciate that what we say in this book does *not* apply to all kinds of innovations, just to the subset of innovations that can be classified as radical. Our interest is in radical innovations because these are the kind of innovations that give rise to new-to-the-world markets.

Not all innovations are radical. When we classify innovations along the dimensions of their effect on customer habits and behaviors and their effect on the established firms' competences and complementary assets, we get four types of innovations, as shown in Figure 1.1. The dividing points in the matrix are obviously subjective and our intention is not to defend the boundaries of a particular definition. Rather, our goal is to simply suggest that “innovation” can mean different things to different people, that different types of innovation exist, and that a given innovation may be more or less radical than another innovation.

Our interest in this book is on those innovations labeled as *radical* innovations in this matrix. These are innovations that have a

**Figure 1.1. Different Types of Innovation.**

Effect of Innovation on Consumer Habits and Behaviors	Major	Major innovation	Radical innovation
	Minor	Incremental innovation	Strategic innovation
		Enhances	Destroys
		Effect of Innovation on Established Firms' Competencies and Complementary Assets	

disruptive effect on both customers and producers. They are based on a different set of scientific principles from the prevailing set, create radically new markets, demand new consumer behaviors and present major challenges to the existing competitors. The introduction of the car at the end of the nineteenth century is an example of radical innovation. *Incremental* innovations, on the other hand, merely extend the current proposition facing consumers. They introduce relatively minor changes to the product or service, build upon the competences and assets of the existing competitors, and tend to reinforce the dominance of the established players. The introduction of new features in a car (such as four-wheel drive, power steering, and fog lights) are examples of incremental innovations.

*Major* innovations are those that require fundamental changes in consumer behavior but build upon the established players' competences and complementary assets. For example, the introduction of picturephones could be considered a major innovation

for phone manufacturers, as could the introduction of online banking for most banks. These are innovations that the established competitors will champion because they build upon their existing competences.

Often an innovation produces seemingly modest changes to the existing product but has quite dramatic consequences on competition. For example, the introduction of small cars (and small motorcycles, copiers, earth-moving equipment, radios, and cameras) by Japanese manufacturers in the 1970s brought havoc to U.S. manufacturers. The challenge was not so much technological as strategic—the new products required fundamentally different business models from the ones that U.S. producers were using to sell their existing products. This change undermined the established players' complementary assets and allowed the Japanese producers to steal market share. These innovations are called *strategic innovations*, and they are based on new business designs.<sup>1</sup> Examples of such innovations include low-cost point-to-point flying, online brokerage, and private label in fast-moving consumer goods.

Different innovations produce different kinds of markets. For example, Table 1.2 lists a number of markets that have been created through innovation—those on the left came about through radical innovation while those on the right came about through strategic innovation. Our real interest in this book is on the markets that are created through *radical innovation*—how and when they emerge and how firms ought to compete in these markets.

Academic researchers have been studying radical innovation for the last fifty years. As a result, we now know many things about the markets that get created by this kind of innovation. For example, we know how they get created and by whom. We know who colonizes them and who makes money out of them. We even know how they will evolve and how they will die. Our book builds upon this knowledge to offer advice to firms that aspire to create radical new markets. More specifically, our book addresses the question, How could big, established firms achieve radical innovation?

**Table 1.2. New Markets Created Through Innovation.**

<i>New Markets Created Through Radical Innovation</i>	<i>New Markets Created Through Strategic Innovation</i>
Television	Internet banking
Personal computers	Low-cost point-to-point flying
Personal digital assistants (PDAs)	Private label consumer goods
Cars	Screen-based electronic trading systems
Supercomputers	Generic drugs
Semiconductors	On-line distribution of groceries
Mobile phones	Catalog retailing
Video cassette recorders (VCRs)	Department stores
Medical diagnostic imaging	Steel minimills
Computer operating systems	On-line universities

### **Misconceptions About Markets Created by Radical Innovation**

Over the past fifty years, a lot of ideas have been developed and much advice given to companies on how they can become more innovative so as to create entirely new markets. This advice has been hungrily consumed by corporations large and small. After all, what company does not want to become more innovative and what CEO does not dream about leading the way into virgin territories, discovering in the process exciting new markets?

Yet, as we will show in this book, this is nothing more than misplaced hope for the majority of big, established companies! There are two reasons why we say this: first, most big companies cannot create *radical* new markets; second, such companies should not want to *create* radical new markets.

Big companies are unlikely to create radical new markets for two main reasons. First, the innovation process that creates radically new markets cannot be easily replicated inside the modern corporation. As we will show in this book, radical innovations that

give rise to entirely new markets are rarely driven by demand or customer needs. Rather, they are pushed onto the market by scientists working on independent projects all over the world. Supply-push innovation processes emerge in a wide variety of industries and share certain characteristics:

- They are developed in a haphazard way without a clear customer need driving them.
- They emerge out of the efforts of a large number of scientists and engineers working independently on seemingly unrelated research projects, who sometimes devise the technology for their own uses.
- They go through a long gestation process when nothing seems to happen until they suddenly explode onto the market.

Now ask yourself: Is this an innovation process that can be replicated in the R&D facility of a single firm? As we will show later, big companies cannot simply import or replicate such a process inside their R&D laboratories.

But there is a second reason why big companies cannot *create* radically new markets: they do not have the skills or mindsets for it! Even worse, all attempts to learn the necessary skills or adopt the necessary mindsets will not do the trick for them. This is because the skills and mindsets that they currently have (and need) to compete in their mature businesses conflict with those they would need for creation. Trying to incorporate the new skills and mindsets into the existing organizational DNA will end in failure.

This simple fact has not discouraged academics from continuing to offer advice to big companies on how they could adopt the skills and mindsets that will make them successful discoverers of new markets. For example, noting that big companies operate with so many rules and regulations that end up stifling creativity, several researchers have proposed that not only should the strategy process in the modern corporation be modified to allow everybody in the



company to contribute strategic ideas but the culture of established corporations should be changed to encourage and promote activists and revolutionaries—rather than employees who simply obey the rules. Similarly, arguing that the incentives and planning processes within the established firm can suffocate the growth of new disruptive markets, other researchers have proposed a separate business-planning process to develop and nurture new business creation.

Yet, despite all this advice and good intentions, it is very rare to find a big company among the innovators that create radically new markets. Why not?

What people forget is that successful innovation is essentially a coupling process that requires the linking of two distinct activities: first the discovery of a new product or service idea and its initial testing in the market, a process that, if successful, creates a new market niche—an activity that we will call *colonizing* a new market; and second the transformation of the idea from a little niche into a mass market—an activity that we will call *consolidating* the market. It turns out that the skills, mindsets, and competencies needed for discovery and colonization are not only different from those needed for consolidation and commercialization, they also conflict with the latter set. This implies that the firms that are good at invention are unlikely to be good at commercialization and vice versa.

Some firms—primarily young, small, and agile—are good at colonization. Other firms—primarily older, established, and big—are good at consolidation. It's extremely hard, however, to find firms that are good at both colonization and consolidation. This suggests to us that instead of advising the established corporation how to adopt skills and mindsets that are alien to its DNA, we should be encouraging it to focus its attention on what it does best: consolidating new markets.

### More Misconceptions

To reiterate, not only is the innovation process that creates new radical markets impossible to replicate inside a firm but—even worse—the skills and mindsets that big established companies have

are not the ones needed for *creating* radical new markets. Nor can established firms easily adopt the skills of creation, because they conflict with their existing skills. This all sounds discouraging for established firms, but not everything is bad for them! They may not be good at creating radical new markets, but, truth be told, they don't need to.

That's because *creating* radical new markets is not where the money is. Real value comes from *consolidating* newly created markets, not from discovering them. And don't believe those that tell you that you need to be the discoverer of a new market to then consolidate it or that those that discover the new market are the ones that consolidate and conquer it. The evidence shows that colonization and consolidation are essentially different activities undertaken by different firms. The evidence also shows that if you have the skills to discover new markets, it's unlikely that you will have what it takes to scale up these markets; and vice versa.

As a result, the companies that end up capturing and dominating the new-to-the-world markets are almost never the ones that created these markets. Given this fact, why would any established company want to create a new market? Surely, the advice we should be giving established companies is how to scale up and consolidate new markets, not how to create them.

Not that the misconceptions about new markets stop there. There is now a widely held belief that even if a company does not actually create a new market, moving fast to colonize it pays off. The importance of pioneering or being first to move into a new market is something that generations of managers have been taught to accept as conventional wisdom. Yet pioneering the new-to-the-world markets is simply bad advice for established firms! It's not that pioneering is bad in all cases—but for radical, new-to-the-world markets it is.

If we were to take a close look at how new markets get created and how they look in their early formative years, the pattern that repeats itself again and again is the following: the companies that grow to dominate these new markets are almost never the first

into the new market. The success of the conquerors of new-to-the-world markets is based not on moving fast but on choosing the right time to move—and that is rarely first. In fact, the majority, if not all, of the pioneers of new markets rarely survive the consolidation of the market—most disappear, never to be heard of again.

The problem is that the pioneers of new-to-the-world markets die quickly and without first growing the market to a respectable size that would win them attention. As a result, they quickly vanish from people's memories and the glory that in truth belongs to them is thrust upon those who came after them and successfully scaled things up into a big mass market. Thus most people believe that Edison pioneered electric lighting or even that Gillette pioneered the safety razor. Yet nothing could be further from the truth!

As it turns out, the structural characteristics of radically new markets are such that pioneering by big companies rarely makes sense. Most established companies would do better if they follow the *fast-second* strategy. In other words, the companies that conquer radical, new-to-the-world markets do so by racing to be second.

### What This Book Is All About

Our thesis is that it is impossible to offer proper advice on how to create or colonize new markets without first understanding where new markets come from, what they look like, and what it takes to succeed in them. It's only by starting our analysis with the question, What are the structural characteristics of newly created radical markets and what skills are needed to create and compete effectively in these new markets? that we would be able to identify the full list of skills and competences needed and the strategies that must be adopted if a firm is to be a successful colonizer.

It is important that we go beyond the generic question, How can the modern corporation become more innovative (and so create new markets)? This question assumes that the same prescriptions that will help a firm achieve product or process or strategic innovation will also help it achieve radical innovation. This is a

fallacy. To appreciate the full extent of the challenge that established companies face if they are to compete effectively in young and immature markets, it is first necessary to understand how these markets get created and what they look like. In fact, the full extent of what established companies need to do or change to be successful creators of new markets is such a formidable challenge that many of them are better off not even trying.

### The Structure of the Book

The next two chapters of the book describe in detail the early evolution of radical new-to-the-world markets. In Chapter Two, we discuss the drivers of radical innovation. We focus on demand and supply-side influences, arguing that, in the main, most radical new technologies are pushed onto the market from the supply side. The important implication of this is that new-to-the-world products that emerge out of these technologies are generally not well adapted to users' needs, a state of affairs that creates many opportunities for entrepreneurs to offer different adaptations or applications of the new technology to the market.

This in turn creates the conditions for entry into the new market, a subject we discuss in Chapter Three. We spend some time discussing why entry occurs on such a large scale, trying to identify where these entrants come from. For a variety of reasons that we examine rather carefully in this chapter, most markets cannot sustain the huge number of firms that enter early. Nor can the early market sustain the wide range of product variants made available by all the early entrants to the market. As a consequence, there is often a shakeout, both among different product variants and also among the firms that supply them. What emerges is a well-defined product—a sort of product standard, which we will refer to as a *dominant design*—that comes to define the market and gives it its particular shape. This in turn creates the basic ground on which the market subsequently evolves.

In the short run, the emergence of what we call a *dominant design* lays the groundwork for the rapid expansion of the market,

bringing in a number of cohorts of different types of consumers who together make up the mass market. The chapter explores the process by which this occurs. In the longer run, the dominant design shapes the nature of competition that occurs in the market, and this in turn shapes its future evolution. The rest of the book explores the implications of these facts and figures of newly created markets.

Having described how radical new-to-the-world markets get created and what they look like in their early years, we then embark on an exploration of the managerial implications of our analysis. Looking at a new market from the perspective of an established company operating on the periphery of the new market, these are the issues that this established player faces:

- Should I be in the business of creating such radical markets myself or should I let others create them for me?
- If I do decide to enter a radical new market, when should I make my move?
- Once I enter the new market, how do I conquer it by scaling it up?
- Once I scale it up, how do I position myself in a market that has grown into a mass market?

We devote a chapter to each of these issues. Thus, in Chapter Four we examine what skills, attitudes, and processes are needed to be successful in market creation. We show that these skills and competencies are not only different from those that established companies have but also conflict with them. This implies that established firms are unlikely to be good at creating new markets. In our opinion, what the established corporation ought to focus on is not creating new markets but taking the markets that start-up firms have created and scaling them up into mass markets. This is the area where the established corporation has unique advantages over the small start-up firms and should therefore be the focal area of their attention. This strategy of open innovation will lead to a

radical redesign of the organizational structure of the modern corporation, something that we see in other creative industries as well.

We pick up the issue of how to scale up new markets in Chapter Five. As a way of introducing the discussion of what is involved in scaling up, we revisit the “crossing of the chasm” problem: how to grow the initial niche into a mass market. Scaling up is really about expanding off an initial, modest penetration in the market, and it should follow naturally from whatever it is you are doing to establish a dominant design.

For a firm to establish its own product variant as the dominant design in the industry is of paramount importance. This requires several tactics and strategies:

- Getting prices down, usually by making the product “good enough” and investing in learning as well as in new plants to exploit scale economies
- Deciding whether the design is going to be open or proprietary
- Securing suppliers of complementary assets
- Winning the expectations game with consumers

Chapter Five explores how a company can do all this.

Given the burnout of early pioneers in new radical markets, one key question for any established firm is, When should I attempt to enter the new market? This is the subject matter of Chapter Six. Most established firms confronted with a new technological possibility either choose to close their eyes and ignore it or to rush right in before the opportunity disappears. In most cases, both these options are foolish. The best strategy for big, established firms to adopt is what we call the *fast-second* strategy. (In fact, the choice between being a colonizer or a consolidator is really a choice between being a first mover or a fast second mover.)

As an example of a fast-second strategy, consider the case of a firm in a very new market. A first-mover strategy would involve getting in there quickly and producing your own product variants;

a fast-second strategy would involve waiting for the dominant design to begin to emerge before moving. Meanwhile, a traditional second-mover strategy would involve waiting for the dominant design to be completely established and accepted in the market, and then producing a me-too product under that standard.

We all know what the second-mover strategy involves—competing on costs and low prices. The first-mover strategy is very attractive, but the odds of success are low (as we show in Chapter Three). That leaves the very interesting possibility of playing a fast-second strategy in such markets, a strategy that IBM made famous in mainframes (and one that others have followed successfully as well, such as GE in CT scanners, JVC in video recorders, Canon in cameras, Black & Decker in food processors, P&G in diapers, Sharp in fax machines, and Texas Instruments in pocket calculators).

Once the market is scaled up, the firm has to decide what strategic position to claim as its own in this market. You cannot sell everything to everybody. Since there are several viable positions in any industry, your task is to choose which one to claim as your own. This is what developing a well-differentiated strategy is all about. Chapter Seven explains how to make these strategic decisions.

Finally, Chapter Eight summarizes our analysis and offers our final thoughts on how established companies could position themselves to take advantage of the innovation possibilities of the twenty-first century. We argue that creative industries such as film or theater have a lot to offer in terms of ideas on how the modern corporation ought to be structured and how it should go about innovating. We also explore how a company can compete with dual strategies. An established firm that has successfully moved into and scaled up a new-to-the-world market is now operating in two kinds of markets: its old, mature market and the new market it has just colonized. The key success factors in the two markets are different and the competencies needed in each are also different. This is the problem that any diversifier faces, but the real complications arise if the competencies required to compete in the two markets

are not only different but also in conflict with each other. How then can a firm manage two conflicting games? The chapter shows how this could be achieved either through separation or by becoming ambidextrous.