# The innovator's dilemma

***Abdulrazak Abyad***

**Correspondence:**
A. Abyad, MD, MPH, MBA, DBA, AGSF , AFCHSE
CEO, Abyad Medical Center, Lebanon.
Chairman, Middle-East Academy for Medicine of Aging
President, Middle East & North Africa Association on Age & Alzheimer's
Coordinator, Middle-East Primary Care Research Network
Coordinator, Middle-East Network on Aging
**Email:** aabyad@cyberia.net.lb

Submitted : August 2020, Accepted August 2020, Published September 2020
Citation: Abdulrazak Abyad. The innovator's dilemma. Middle East Journal of Business. 2020; 14(3): 15-19.
DOI: 10.5742MEJB.2020.93870

## Abstract

The Innovator's Dilemma describes both the processes through which disruptive technologies supplant older technologies and the powerful forces within well-managed companies that make them unlikely to develop those technologies themselves. In this review we present various discussions in regard to the innovation dilemma. In addition we discuss some of the principles whereby companies can become more effective at developing for themselves the new technologies that are going to capture their markets in the future.

**Key words**: innovation, new technologies

## Introduction

If you pay close attention to any industry driven by innovation, you'll notice a distinct pattern: A founder has a problem that no good solution exists for. They develop an innovative product or service, and they start a company to sell it to others. Soon they want to maximize profits, so they hire managers to do two things: sell more and reduce costs.

Then an employee has a radical idea for a completely different type of solution. It's not the solution customers are asking for, and it's more expensive to produce than the current one, so the manager now has a dilemma. Do they approve the new solution, betting that this is the direction of the industry, or do they kill the project to protect profits?

Well, in companies that are profit focused, the answer is simple: they kill the project. You see, the manager was hired to hit certain profit targets. If they miss their targets they lose face with upper management, their reputation is damaged, their bonuses are denied, and often they will lose their job. To prevent these unpleasantries, every decision a manager makes is tied to profits. Who they hire, who they promote, what KPIs get measured and what projects they approve. Needless to say, a disruptive solution that customers are not asking for, which costs more to produce will almost always get cancelled.

Dropping ' the project usually results in the employee leaving the company to spin off a startup selling the new solution. While they don't have the resources or recognition of the larger company, the solution is so innovative that customers are happy to pay a premium. Soon enough the startup now dominates the market, the original company is out of business, and the new startup turned big corporation begins to focus on maximizing profits.

Some innovative companies are different, such as Apple. Their core value was, "make great products" not "make higher profits". Steve Jobs instilled those values into the people he worked with, and in the company culture. That has allowed Apple to overcome the innovators dilemma, innovating year after year, and banking billions in the process.

In The Innovator's Dilemma, book Professor Clayton Christensen asks the question: Why do well-managed companies fail? He concludes that they often fail because the very management practices that have allowed them to become industry leaders also make it extremely difficult for them to develop the disruptive technologies that ultimately steal away their markets.

Well-managed companies are excellent at developing the sustaining technologies that improve the performance of their products in the ways that matter to their customers. This is because their management practices are biased toward:

• Listening to customers,

• Investing aggressively in technologies that give those customers what they say they want

• Seeking higher margins, and

• Targeting larger markets rather than smaller ones.

Disruptive technologies, however, are distinctly different from sustaining technologies. Disruptive technologies change the value proposition in a market. When they first appear, they almost always offer lower performance in terms of the attributes that mainstream customers care about. In computer disk drives, for example, disruptive technologies have always had less capacity than the old technologies. But disruptive technologies have other attributes that a few fringe (generally new) customers value. They are typically cheaper, smaller, simpler and frequently more convenient to use. Therefore, they open new markets. Further, because with experience and sufficient investment, the developers of disruptive technologies will always improve their products' performance, and they eventually are able to take over the older markets. This is because they are able to deliver sufficient performance on the old attributers, and they add some new ones.

The Innovator's Dilemma describes both the processes through which disruptive technologies supplant older technologies and the powerful forces within well-managed companies that make them unlikely to develop those technologies themselves. Prof. Christensen offers a framework of four Principles of Disruptive Technology to explain why the management practices that are the most productive for exploiting existing technologies are anti-productive when it comes to developing disruptive ones. And, finally, he suggests ways that managers can harness these principles so that their companies can become more effective at developing for themselves the new technologies that are going to capture their markets in the future.

## Principles of Disruptive Technology

***#1 Companies Depend on Customers and Investors for Resources***

In order to survive, companies must provide customers and investors with the products, services and profits that they require. The highest performing companies, therefore, have well-developed systems for killing ideas that their customers don't want. As a result, these companies find it very difficult to invest adequate resources in disruptive technologies -lower margin opportunities that their customers don't want - until their customers want them. And by then, it is too late.

***#2 Small Markets Don't Solve the Growth Needs of Large Companies***

To maintain their share prices and create internal opportunities for their employees, successful companies need to grow. It isn't necessary that they increase their growth rates, but they must maintain them. And as they get larger, they need increasing amounts of new revenue just to maintain the same growth rate. Therefore, it becomes progressively more difficult for them to enter the newer, smaller markets that are destined to become the large markets of the future. To maintain their growth rates, they must focus on large markets.

***#3 Markets That Don't Exist Can't Be Analyzed***

Sound market research and good planning followed by execution according to plan are the hallmarks of good management. But, companies whose investment processes demand quantification of market size and financial returns before they can enter a market get paralyzed when faced with disruptive technologies because they demand data on markets that don't yet exist.

***#4 Technology Supply May Not Equal Market Demand***

Although disruptive technologies can initially be used only in small markets, they eventually become competitive in mainstream markets. This is because the pace of technological progress often exceeds the rate of improvement that mainstream customers want or can absorb. As a result, the products that are currently in the mainstream eventually will overshoot the performance that mainstream markets demand, while the disruptive technologies that underperform relative to customer expectations in the mainstream market today, may become directly competitive tomorrow. Once two or more products are offering adequate performance, customers will find other criteria for choosing. These criteria tend to move toward reliability, convenience and price, all of which are areas in which the newer technologies often have advantages.

A big mistake that managers make in dealing with new technologies is that they try to fight or overcome the Principles of Disruptive Technology. Applying the traditional management practices that lead to success with sustaining technologies always leads to failure with disruptive technologies, says Prof. Christensen. The more productive route, which often leads to success, he says, is to understand the natural laws that apply to disruptive technologies and to use them to create new markets and new products. Only by recognizing the dynamics of how disruptive technologies develop, can managers respond effectively to the opportunities that they present. Specifically he advises managers faced with disruptive technologies to:

1 -- Give responsibility for disruptive technologies to organizations whose customers need them so that resources will flow to them.

2 --Set up a separate organization small enough to get excited by small gains.

3 -- Plan for failure. Don't bet all your resources on being right the first time. Think of your initial efforts at commercializing a disruptive technology as learning opportunities. Make revisions as you gather data.

4 -- Don't count on breakthroughs. Move ahead early and find the market for the current attributes of the technology. You will find it outside the current mainstream market. You will also find that the attributes that make disruptive technologies unattractive to mainstream markets are the attributes on which the new markets will be built.

## The Innovator's Dilemma and the Future of Silicon Valley

Silicon Valley, the center of the high-tech industry, has become the biggest industrial cluster in the U.S., followed by the banking industry on Wall Street, the automobile industry in Detroit, and the entertainment cluster in Hollywood. As a successful model, Silicon Valley faces competitors and imitators from all over the U.S., from Washington, DC to Seattle, Washington, from Austin, Texas to Boston, Massachusetts. Can the Valley keep its leading position in the future?

More than anywhere else, the economy in Silicon Valley is driven by continuous innovations. Firms in the Valley compete fiercely by introducing innovations rather than cutting prices. It has been recognized that Silicon Valley has the ability to reinvent itself over time. This ability is not only an important determinant in the Valley's past success but also the key to whether it will remain a big success in the future.

Professor Christensen (1997) at Harvard B-school wrote a national bestseller that popularized his concept of "innovator's dilemma." The book investigates why successful big companies are often defeated by new comers and lose their market dominance. While it is clear that the author is addressing to managers in successful companies, regional economists can learn a lot from his insightful analysis.

Following Christensen (1997), we emphasize the distinction between sustaining innovations and disruptive innovations in this article. Disruptive innovations refer to those big technological or organizational breakthroughs that revolutionize the business in a big market or the whole industry. A region reluctant to accommodate disruptive innovations is more likely to lag behind in Schumpeterian competition (competition by innovation). The author argue that big successful firms face the "innovator's dilemma": their success in the existing market tends to prevent them from implementing or adopting disruptive innovations. Startup firms targeting at a niche or an emerging market are most likely to adopt and promote disruptive innovations. He believes that Silicon Valley was able to reinvent itself in the past mainly because it provided a relatively favorable environment for the formation of new firms. Likewise, the future of Silicon Valley will be determined by its birth rate of new firms. The higher rate at which the Valley generates new firms, the more likely it will catch the next wave and reinvent itself around the next big thing.

## The Innovator's Dilemma

Christensen (1997) writes about the failure of companies to stay atop their industries when they confront certain types of market and technological changes. As the author emphasizes, "[the book is] not about the failure of simply any company, but of good companies - the kinds that many managers have admired and tried to emulate, the companies known for their abilities to innovate and execute." His conclusion is that successful companies often fail because of the very management practices that have allowed them to become industry leaders. Those practices make it extremely difficult for them to develop or adopt the disruptive technologies that ultimately steal away their markets. It is a dilemma because companies fail for the same reason they succeeded. This is, in spirit, similar to Schumpeter's famous thesis that capitalism will fail because of its success. While there has not been any concrete case to prove Schumpeter's theory, numerous failures of great companies have exemplified Christensen's dilemma.

Take the computer industry as an example. IBM once dominated the mainframe market but lagged behind for years in the minicomputer market, although the latter is technologically simpler than mainframes. Digital Equipment Corporation (DEC) pioneered in the minicomputer market, closely followed by Data General, Hewlett-Packard, Nixdorf, Prime and Wang. However, each of those missed the emergence of the desktop personal computer market. In this case, it was another new comer Apple Computer that took the lead. When Apple brought its portable PC to the market, however, it was already six years behind Compaq. Similarly, the workstation market was created by some other rookie players at the time, namely, Apollo, Silicon Graphics and Sun.

A similar story is found in the hard-disk-drive industry, the example that Christensen has referred to again and again (Christensen, 1997). In that industry, "no single disk-drive manufacturer has been able to dominate the industry for more than a few years. A series of companies have entered the business and risen to prominence, only to be toppled by newcomers who pursued technologies that at first did not meet the needs of mainstream customers. As a result, not one of the independent disk-drive companies that existed in 1976 survives today." (Bower and Christensen, 1995)

Why do disruptive technologies cause great firms to fail? Christensen (1997) argues that great companies are managed in the way that makes them excellent at developing or adopting sustaining innovations and hence succeed. However, the same set of practices make them miss disruptive innovations and hence fail.

**1.** Successful firms listen to their customers and invest aggressively in technologies that give those customers what they say they want. This helps those firms to attain their market dominance. However, at the same time, this practice prevents them from getting the right information about disruptive innovations. A firm's current customers will naturally demand a product that performs better than the one they are buying. A disruptive technology usually represents a very different product that does not provide better performance but only adds more dimensions to the existing product. For example, laptop notebooks are not as powerful as desktop PCs; a 3.5-inch disk drive does not have more capacity than a 5.25-inch disk drive. For this reason, firms trying hard to serve their current customers fail to see the importance of disruptive innovations.

**2.** Successful firms seek high margins and target large markets rather than small ones. However, disruptive innovations usually fit into a niche market or a market that does not exist at all for the time being. Moreover, disruptive innovations, although they have a bright future, usually bring little or no profit in the short term. When Steve Jobs and Steve Wozniak brought

forward their Apple I to the market in 1976, only 200 units were sold to hobbyists and few people took it seriously. They were lucky enough for not losing money, not to mention collecting big profits. Inevitably, a giant like IBM with an annual profit of millions would and should ignore it at the early stage until the potential of the PC was fully recognized. In fact, IBM's stand-alone PC division later did successfully grab a substantial piece of the pie in the emerging PC market, which is rather an exception in the world of Innovator's dilemma. It is worth noting that many great firms missed disruptive innovations not because they did not have the technology, but because they were too eager to seek something big. Seagate Technology once was a great success in the disk drive industry, whose revenue grew to more than $700 million dollars in six years since its inception. It was the pioneer and a big player in the 5-inch hard-disk-drive market. Seagate had developed their own 3.5-inch disk drive but had chosen to put it on the shelf, because it could not bring the big profit they expected from a new product. In the end, Seagate became only a minor supplier of 3.5-inch disk drive when that market boomed.

Christensen may have been indulging himself too much in the paradoxical observation that great firms fail for the reasons they succeeded. He neglects some inherent problems with big firms that may be crucial in accounting for their failures to catch disruptive innovations.

**3.** Disruptive innovations usually bring a new product that will compete with the current well-marketed product, or a new organization that will turn the existing corporate structure upside down. Over the past two decades, perhaps there has been no high-tech firm as successful as Microsoft. It is common knowledge that Microsoft's recent success is built around its dominant operating system Windows. Is Microsoft an innovative firm? Sure, it is. But all their innovations are sustaining in the sense that they enhance Microsoft's Windows and its software based on it. Any platform-independent technology such as Internet protocols and Java software protocols will be disruptive to Microsoft. If Microsoft develops those technologies, it is committing suicide and choosing to be reborn. It is Microsoft's right rather than wrong decisions to show little enthusiasm to Internet at its early stage and to fight against Sun Microsystems for its Java. Microsoft's huge market share prohibits itself from developing disruptive technologies and competing with itself. Its destiny is to be dethroned by other firms with disruptive innovations.

The telecommunication industry tells a long story about AT&T's hostility to disruptive innovations. No one has doubted that AT&T, in its early years, was doing a great job of improving the efficiency and effectiveness of the Bell system, which transfers voice communication over long distances through copper lines. Research on radar during World War II made breakthroughs in microwave transmission. To AT&T's Bell system; the microwave technology is a radical and more efficient alternative that employs tall towers with antennas to relay microwave messages. Although AT&T was working on its own microwave system, it took its time in spreading the technology over the mass market. At the same time, AT&T lobbied Federal Communications Commission (FCC) to keep other microwave innovators out of the transmission market. It took a new comer Microwave Communications, Inc. (better known as MCI now) a long fight against AT&T to finally get FCC's authorization to provide long distance service in 1971. Yet history repeated itself when there came the cellular phone. The birth of the cell phone technology traces back to AT&T's Bell Labs, but AT&T again failed to make the cellular business. It was Seattle's Craig McCaw who created America's first nationwide commercial wireless network. Ironically, AT&T bought McCaw's network in 1993, which becomes today's AT&T Wireless (Norton, 2001).

Another example is that Barnes & Noble failed to pioneer in on-line books and music retailing. Again, it is a "right" decision, because if Barnes & Noble had opened that market, it would be competing with its own physical stores. Nowadays both Barnes & Noble and Borders have their own on-line store, which is only a defensive measure against Amazon.com. One feature of the high-tech industry is that the first mover usually enjoys a big advantage over followers. Barnes & Noble has spent a lot of money advertising its own on-line bookstore, but is still trailing Amazon from far behind.

**4.** Another reason that great firms often missed disruptive innovations is that it is often too risky to pursue those innovations. The triumph of disruptive innovations usually hinges on an emerging market. It is easy to recognize an emerging market ex post, but not ex ante. In the late 1970s, who could anticipate the prevalence of personal computers today? A disruptive innovation, never tested on the market, has a much higher chance of ending up as a failed project. Even legendary venture capitalists in Silicon Valley have to live with the cruel reality that one in every three of their investments produces a total write-off. Few established firms are willing to face dead programs so frequently. So they choose to avoid such projects. For this reason, new startups are most suitable for experimenting disruptive innovations, because they are usually backed by venture capitals or banks, institutions that have better ways to neutralize risks. Think about it, the successes of Netscape and Yahoo had covered how much loss incurred by hundreds of dead startups in Silicon Valley?

## Conclusion

Following Schumpeter, we perceive the economy, especially the high-tech industry, as an evolutionary process driven by innovations and entrepreneurship. In light of the "innovator's dilemma," we recognize that successful big firms are excellent at developing and adopting sustaining innovations, but are likely to ignore disruptive innovations. Moreover, disruptive innovations are extremely important to a specialized regional economy because those innovations bring radical and fundamental changes to an industry. We argue that the success of Silicon Valley in the past is achieved by its generations of startups that have not missed any wave of disruptive innovations. We also believe that the future of Silicon Valley hinges on its birth rate of startups and hence suggest policies in favor of the formation of new firms.

It is particularly worth noting that disruptive innovations are hard to identify ex ante. Professor Christensen and his partner launched a mutual fund in 2000. Based on Christensen's theory, they select stocks of companies that are considered as disruptive. The fund, which was called the "Disruptive Growth Fund," was closed before its first birthday with 64% of its value lost. It is a vivid example that nobody but the market decides

which technology is able to cause disruption. Nobody can pick winners. If a regional economy such as Silicon Valley wants to win the game on the market, it has to have more players. That is, to encourage the creation of new firms.

## References

1. J. L. Bower and C. M. Christensen, 1995. "Disruptive Technologies: Catching the Wave." Harvard Business Review, Jan.-Feb., 43-53.
2. Business Week, 1997. "Silicon Valley: How It Really Works." August 18-25, 64-147.
3. Christensen, C. M., 1997. The Innovator's Dilemma. Cambridge, MA: Harvard Business School Press.
4. Cooper, A and T. Folta, 2000. "Entrepreneurship and High-technology Clusters." In The Blackwell Handbook of Entrepreneurship, edited by D. L. Sexton and H. Landstrom. Malden, MA: Blackwell Business.
5. Hellmann, T. and P. Manju, 2000. "The Interaction between Product Market and Financing Strategy: The Role of Venture Capital." Review of Financial Studies 13(4), 959-84.
6. Norton, R. D., 2001. "The Geography of Radical Entrepreneurship in U.S. Telecommunications After 1960." Unpublished paper draft.
7. Saxenian, A., 1994. Regional Advantage: Culture and Competition in Silicon Valley and Route 128. Cambridge, MA: Harvard University Press.
8. Schumpeter, J. A., 1934. The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle. Cambridge, MA: Harvard University Press.
9. Schumpeter, J. A., 1950. Capitalism, Socialism and Democracy, 3rd ed. New York: Harper & Brother