



Imitation happens

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..... Imitation happens. Sometimes it is obvious when it happens, such as the resemblance of Internet Explorer 1.0 to Netscape Navigator 1.0. Sometimes it is vaguely in the details, such as the resemblance of the trash can in Windows to the same symbol in the Macintosh OS. Sometimes it is there in spirit but not in detail, such as the way the Ford Windstar compares to the original Chrysler minivan.

A common perception is that there is more competitive imitation today than in the past. Is there truth to this perception?

A couple months ago, I became tongue-tied explaining how a gyroscope works to my six-year-old son. I expect much the same result as I try to explain why there is more imitation of inventive activity today than in the past. I would like to give a simple description, but the topic inherently precludes it.

In this case, lawyers are part of the problem. Conversations get off on the wrong foot in court. All inventors and their patent attorneys believe there is too much unethical imitation. For my tastes, this assertion is just too argumentative; there is no objective definition for *too much* or *too little* imitation.

The other part of the problem is with imitators themselves. There is nothing more tedious than talking to people about the details of reverse engineering. And, of course, the conversation is even more difficult if they used unethical methods.

Let's try something unusual. How about discussing imitation without turning it into a morality tale between heroic

inventors and unethical villains? This might be a useful way to understand the phenomenon without becoming tongue-tied.

A starting point

Consider what happens after a firm introduces a new product design with a couple of unique features, such as a newly redesigned digital camera. Most high-tech markets have examples of products with new features, whether it is in aeronautics, disk drives, or new video games.

There are two key questions to ask. First, how fast will an imitator be able to bring to market a product that directly replicates all the distinctive features of the inventive product? Second, will the imitator need as much, more, or less money than the inventor who invented these unique features?

I love asking those questions in a room full of high-tech executives. Four things happen.

First, virtually every experienced executive can describe a typical situation in his own market. Analyzing these situations is a familiar drill in most firms.

Second, and usually to everyone's surprise, executives from different industries give widely different descriptions of the typical episode. Most executives have no idea that others have it so different.

Third, some patterns always emerge. In virtually every industry, it is usually much cheaper to be second than first, because the inventor had to go through the trial and error process. The inventor helps identify the target for the imitator.

Moreover, the best measure of speed comes from silent competitors, in terms of months and sometimes, years.

Fourth, inventors can take actions, that is, file patents; maintain trade secrets; and develop brands to slow down imitators or drive up their costs. The situation will be worse for the inventor without such actions. But none of these actions are panaceas. Imitation happens anyway, even when inventors do all they can to prevent it.

To understand the broader point, consider dividing the world into fast and slow imitation. Let's explain how each of these work.

Fast, both expensive and cheap

No matter how good the idea, no matter what the inventor does to protect it, imitation is fast and cheap in many markets. This phenomenon is most visible in an electronics retail outlet, such as Best Buy or Circuit City. Sony might have a new and exclusive feature in its camcorders, but it does not stay that way for long. Within the span of one product cycle (less than six months), virtually all competitors will have an equivalent feature.

Despite the frenzy, it is fascinating to watch how firms try to gain from such distinctive, short-lived features. Sony tries to brand its inventiveness with trademarked names, such as "Memory Stick." Sony integrated the memory stick into a wide variety of its products. Compatibility with memory stick is a feature found in many of its consumer products.

Such strategies can work if circumstances are just right. They also have little margin for error. Competitive markets always have young, hungry firms, such as M-Systems, which are not far behind with their portable memory chips, trying to sell them to other firms and integrate them into other products.

More to the point, imitation is fast and cheap because there are many potential imitators in competitive markets. The key word in that sentence is *many*. With many potential imitators, imitation takes a variety of direct or indirect forms.

Contrast these fast and cheap situations with those known for fast and *expensive* imitation. When imitation is expensive, only a few firms can afford it. The key word is *few*. Normally these are large, incumbent firms.

Such markets are often known for the tension among established firms and innovative firms on the frontier. The young firm enters with something inventive, while the established firm reacts, using its considerable manufacturing, distribution, and marketing muscle to fight back as a "strong second."

These episodes are replete with high drama. Microsoft's reaction to Netscape in the late 1990s is one such example. So was Intel's reaction to AMD's development of a chip for the sub-\$1,000 PC market. The drama is misleading, however. Episodes involving strong seconds are much less common than those involving fast and cheap imitation.

More subtly, fast and expensive imitation is often not an isolated episode, though newspaper reporters might explain them as if they are. For example, the browser wars went through four releases before the tide turned in Microsoft's favor. As another example, AMD and Intel had played tit-for-tat for years before Intel introduced the Celeron in response to AMD's inventive chip.

In other words, when imitation is expensive, few incumbent firms would spend the money on just one expensive episode of imitation. It usually is part of a bigger strategy, played out over several episodes.

Slow, both cheap and expensive

By comparison with the surface drama of fast imitation, slow imitation is rather unexciting to watch. It is like appreciating chess after watching many video games. It takes less adrenaline. Still, aficionados know what nuances to look for.

Heavy capital equipment markets, such as machine tools, lithography, airframes, and, yes, automobiles, are known for slow imitation. New product designs take ages to translate from prototype to marketable product. If the products involve complex systems, then firms may have to take great care before simply copying a rival.

Consider an example of slow, but cheap, imitation. When Chrysler first introduced the aforementioned minivan, it had the market to itself for several years. It was not as if the engineers at other auto firms did not understand the design. Of course, any team of imitating engineers understood all the nuances within weeks.

More to the point, it was much cheaper for Ford to copy the idea than it was for Chrysler to blaze the trail. But cheaper does not mean faster. Coming up with a competitive product to send to Ford's distributors took time. It involved making the design, putting together the line, organizing the supply chain, and pushing the product down the channels.

There is one other example of slow, cheap imitation. Occasionally firms who live in markets with fast and cheap imitation manage to take an action to slow down imitators.

For example, Apple's I-Pod entered a market with fast imitators and seems to have hit a sweet spot. It moved the market from being just about MP-3 players or just about software formats (for example, the Real Player) to being about a whole package. There are hundreds of potential imitators, but few imitators have the right combination of negotiating skill and new technology to offer the whole package. Every analyst believes imitation will arise eventually, but it will take some time to put together.

The contrast with slow and expensive imitation also informs. These are situations without imitators. To be sure, most

firms would love to have that situation, but unassailed inventions are a dream. The few cases are well known precisely because of their infrequency.

A recent example is Segway, the revolutionary transportation scooter. Although most patents are imperfect when it comes to stopping rivals, the patents surrounding the Segway protect it quite impressively. They make the Segway virtually impossible to copy without violating at least several patents.

As it has turned out, by the way, this dream has not been free of nightmares. The inventors have not yet figured out how to develop a robust business from this cool technical invention. Which just goes to show the value of silence. Although it is nice to have silence, it is not worth much if the market is not profitable.

Why fast and cheap is more common

Back to the main question: Are most markets characterized by fast and cheap imitation? I think so, and there are several competing explanations for why:

1. In most markets technical capabilities are widely distributed to many firms. There are always engineers at several firms who can reverse engineer almost anything. This resulted from the spread of higher education and engineering training in the latter half of the 20th century.
2. Upstream suppliers like their downstream markets to be competitive. For example, all memory producers, not just one, will buy new lithography machines. That wide distribution will intensify competition in the final market.
3. Patents are only mildly useful and only on occasion. Trade secrets do not work very well most of the time. Markets being what they are, if it's worth a lot of money, then somebody will find a way around instruments to protect ideas.
4. Long ago, competitors recognized the advantages of fast imitation. Hence, most savvy firms invest in

the training and technologies to accelerate their prototyping and product cycles.

5. Ultimately, most inventions are incremental. Incremental inventions are easy to imitate. Only the radical ones put imitators at a disadvantage, and those are rare.
6. Over time antitrust authorities tend to curb the market power of incumbents that silence too many inventors. Whatever you think of the antitrust cases involving AT&T, Microsoft, or IBM, the legal environment's restrictions on incumbent firms does contribute to limiting their power.

So it goes. Fast and cheap imitation characterizes most commodity markets in electronics, such as disk drives, memory

chips, or most other bulk electronic parts. Indeed, that statement employs almost circular logic. It is *because* commodity markets experience such rapid imitation, time and again, that no firm ever gains much of an innovative advantage over others. It is hard to have a product that is not a commodity in such circumstances.

More deeply, many innovative product markets go through a natural evolution. At some stage in the life of these markets, the zeitgeist consists of a rapid pace of invention, as well as rapid imitation. Then both slow down, resulting in a situation like that of yesterday's hottest inventions, such as the VHS-compatible VCR or microwave oven. Competition then predominantly focuses on lowering price because every firm offers the same features. There is little left to invent.

In other words, imitation plays a useful role in a market's evolution. Imitators learn from inventors, pushing the designs forward, leaving nobody complacent. Once the pace slows, however, it is probably because all the good ideas have been fished out.


But there's good news in that analysis: Imitation in most markets doesn't appear to be anywhere near slowing down. This implies that most markets are far from mature, and more inventive activity is just around the bend.

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