

## The Big Idea: Funding Eureka!

by Nathan Myhrvold

My company, Intellectual Ventures, is misunderstood. We have been reviled as a patent troll—a renegade outfit that buys up patents and then uses them to hold up innocent companies. What we're really trying to do is create a capital market for inventions akin to the venture capital market that supports start-ups and the private equity market that revitalizes inefficient companies. Our goal is to make applied research a profitable activity that attracts vastly more private investment than it does today so that the number of inventions generated soars.

"That's preposterous," some might say. "Inventing can't be a business in its own right. It's too risky, and inventions are too intangible to generate sufficient profits by themselves. Inventing and inventions can't be separated from the companies that turn the ideas into actual products. And the notion of creating a liquid market for inventions is absurd."

I couldn't disagree more. In the 1970s, people said the same thing about another type of intangible intellectual property: software. Back then, everyone in the computer industry believed that software was valuable only because it helped to sell mainframes or minicomputers and that you could never sell software by itself. As a result, software engineers worked for computer manufacturers or for companies that used computers. Very few independent software vendors existed, and those that did were barely profitable. As a business, software was hopeless. Everyone said so.

Everyone was wrong, of course. Over the next three decades, software became one of the most profitable businesses in history. I know because, as a manager and ultimately the chief technology officer at Microsoft, I had a ringside seat to this amazing success story.

Software owes its ascent largely to two crucial developments. First, software vendors gradually persuaded software users—through both education and lawsuits—to respect intellectual property rights and pay for something that they might otherwise simply copy. Then vendors liberated software from hardware by overcoming system incompatibilities and developing solutions that could work on many different brands of computer. When the PC revolution hit, software became an industry in its own right.

I believe that invention is set to become the next software: a high-value asset that will serve as the foundation for new business models, liquid markets, and investment strategies. The surprising success Intellectual Ventures has had over the past 10 years convinces me that, like software, the business of invention would function better if it were separated from manufacturing and developed on its own by a strong capital market that funded and monetized inventions.

📖 What an Invention Capital Market Would Do For: (Located at the end of this article)

The lessons we have learned so far suggest that a full-fledged invention capital system could solve many of the problems that have long plagued both inventors and the consumers of inventions: inadequate funding for applied research, an inefficient market for connecting companies with the inventions they need and for monetizing inventions, a balkanization of the invention and inventions required to tackle big problems, and an enforcement and arbitration system that simultaneously permits too much infringement and relies too heavily on lawsuits to determine price.

My company—the largest of a new breed of invention capital firms—is leading the drive to solve these problems. It is still early days. But I'm convinced that if we and firms like us succeed, the invention capital system will turbocharge technological progress, create many more new businesses, and change the world for the better.

## Charity Is Not Enough

America took a global lead in invention during the nineteenth century, when **Eli Whitney, Robert Fulton, Samuel Morse, Nicola Tesla, Alexander Graham Bell, Thomas Edison**, and others helped transform the United States from an agrarian economy into an industrial powerhouse. That tradition has continued to this day. Americans generally recognize inventiveness as one of their nation's competitive strengths. They understand that invention is a powerful engine of economic growth. Yet it gets amazingly little direct attention or funding from product makers, universities, or the government.

Outside the pharmaceutical and biotech industries, few companies consider inventing, or producing patented intellectual

property, to be their primary mission. Corporate R&D has become mostly “D”: the development of products. Hardly any large corporations have “inventing” as a job category—even though it requires a different mind-set, has different goals, and must be managed differently than research and development positions.

At universities and government agencies that fund academic research, patents typically don’t enter into tenure or grant decisions. Published research is rewarded, but invention usually is not. Indeed, these organizations primarily fund blue-sky programs aimed at expanding scientific knowledge. That’s a worthy thing to do. But it’s quite different from invention, which applies scientific knowledge in novel ways to create something useful, something that has economic value.

Invention’s stepchild status is reflected in the way it’s typically funded, which I call the charity model. The entities that provide the vast majority of research funding to U.S. universities—mostly government agencies like the **National Science Foundation**, the **National Institutes of Health**, and the **Department of Defense**, along with private donors—do so without any expectation of a financial return. In other words, research grants are gifts, not investments.

The shrinking handful of corporations that still fund long-range research have the same mind-set. Their leaders rarely run research as a business in its own right; instead, they fund it as an act of faith that the ideas produced will somehow create value as they percolate through the product organization.

The result of the charity mind-set is a dearth of private sector investment and an overdependence on government funding. This is undesirable on many levels. It allows federal priorities, rather than the potential market for new inventions, to determine how much funding particular areas receive. For example, the share of federal funding devoted to basic health and bioscience has steadily grown since the 1950s to about half of the total, whereas the share allocated to areas that produce a greater proportion of fruitful inventions—such as the physical and information sciences—has shrunk.

A second problem is that most federal funding goes to traditional research programs focused on individual disciplines. Innovative cross-disciplinary teams, however, are much better equipped to come up with solutions to the increasingly complex challenges the world faces.

A final problem is that government funding isn’t dependable. Federal spending on basic and applied research, adjusted for inflation, declined by 14% from 2003 to 2007, according to the National Science Foundation. The Obama administration has pledged to reverse this slide, but a skyrocketing federal budget deficit will make that a hard promise to keep.

Rather than relying on the charity model and its overdependence on government-sponsored research, we should be looking for ways to harness the tremendous financial power of the private sector to fund invention. Consider this: Inflation-adjusted federal spending on academic research rose by 60% from 1983 to 2007. Meanwhile, investments in the business sector by the U.S. venture capital and private equity industries soared by 1,140% and 1,940%, respectively. The total \$1.6 trillion (in 2008 dollars) invested by venture capital and private equity firms in this period is three times the \$537 billion that the U.S. government spent on academic research.

The only way invention can attract comparable private-sector investment is to treat inventing like a for-profit business. To do that properly, we need an efficient capital market run by a cadre of professionals. I’m absolutely certain that if we establish such a market, investors will flock to it.

I don’t expect this to be easy. There are some formidable obstacles: the high risks that inventing entails, a disregard for intellectual property rights that prevails in certain industries and countries, a need for much more professional expertise in the emerging invention capital industry, and the disorganized state of the inventing world. We also face a chicken-and-egg quandary: You have to be able to efficiently and profitably monetize inventions in order to attract investors, but to organize such a market, you need the liquidity that only investors can provide. These obstacles can be and are being overcome. Here’s how.

## How to Manage the Risks

Undeniably, a huge challenge in attracting investors is the highly risky nature of inventions. The unavoidable fact is that most inventions fail: Some simply don’t work. Others work but are too costly. Still others are cheap and work brilliantly, but lose out to even better inventions. Statistics on the true risk of investing in inventions are sketchy, but government reports suggest that just 1% to 3% of patents generate a profit for their inventors. Corporations have a similar success

rate.

Fortunately, other industries have found ways to manage high risk. Insurance companies dilute risk by aggregating policies into large portfolios. They also distribute risk by spreading it around a well-developed reinsurance market. Pension funds, mutual funds, and other investment pools assemble large collections of assets to which many investors subscribe.

We can apply these approaches to manage the risk inherent in new inventions. A single invention is typically very risky. However, if you build (as my company has) a diversified portfolio of tens of thousands of inventions that span a wide range of technologies, the aggregate risk becomes quite manageable.

It takes a lot of money, of course, to build a large portfolio of inventions—but not an unprecedented amount. Venture capital and private equity firms routinely raise hundreds of millions or even billions of dollars for a single investment fund. Similar-sized funds dedicated to inventions would provide the scale necessary to hedge their risk.

Such large scale also provides another important ingredient: upside potential. Some inventions will be successful—and a few will be blockbusters. Even if only one patent in a portfolio of, say, 2,000 patents is really successful, it could generate \$1 billion in revenues, returning many times the cost of the entire portfolio.

Plenty of real-world examples prove the principle. A patent portfolio of very respectable, but not enormous, size forms the core asset of Qualcomm, a public company now worth more than \$70 billion. Earnings of the consortium MPEG-LA, which owns patents on technology used in DVD players and digital set-top boxes, are reported to exceed \$1 billion a year. IBM is also said to garner more than \$1 billion a year from licensing its inventions. Similar programs at Hewlett-Packard, Lucent, Texas Instruments, and a few other large technology companies each reportedly generate net annual revenues of more than \$100 million.

There's an obvious difference between investing in invention capital funds and investing in venture capital and private equity funds: The time horizon to make money from inventions is much longer. The typical VC or PE fund lasts 10 years and often generates handsome returns for its investors within five. Invention capital funds require much greater investor patience. Once Intellectual Ventures creates a fund, for instance, we add patents to its portfolio during its first five years and will continue to license them for up to 25 years, until all have expired.

Are there investors with that kind of patience? In our experience, the answer is yes. We see two distinct types of investors among the several dozen who have committed more than \$5 billion in capital to the four funds and one start-up we have created since 2000. The first kind sees invention capital as simply another financial investment alternative, similar to derivatives, hedge funds, private equity, and real estate. These traditional investors include pension funds, university and foundation endowments, and wealthy families and individuals.

The second kind are what we call strategic investors, because they seek more than just a direct financial return. The members of this group—which includes *Fortune* 500 companies and market leaders in high technology, telecommunications, financial services, consumer electronics, and e-commerce—are attracted by the prospect of tapping into Intellectual Ventures' network of invention talent. They're seeking help in coming up with game-changing ideas, or they want early licenses to the patents in our portfolios. Our practice of aggregating patents in specific areas provides strategic investors with efficient one-stop shopping.

## Giving Patents the Respect They Deserve

The main barrier to the emergence of a bona fide market for inventions and a strong, vibrant invention capital industry, however, is not financial. It is cultural.

In affluent nations, product companies too often see inventors and other patent holders as adversaries, and vice versa. But product companies should see inventors as wellsprings of innovation and should trust them—and invention capitalists—enough to tell them what new technology the companies actually need. Inventors, for their part, should see manufacturers and invention capitalists as customers and should trust them to pay fair prices for the ideas they use. We aspire to be a trustworthy matchmaker that helps make this happen.

The cultural impediments are somewhat different in emerging economies such as the rising technology centers of Asia. There, rights to patented inventions and other intangible property are too often simply ignored. Compared with their peers in the U.S., few prominent universities in Asia file patents, and those that do rarely complain when manufacturers

in their own country appropriate their intellectual creations without compensation. We hope to demonstrate to leaders in these regions that greater attention to intellectual property rights can generate immediate and substantial economic rewards, while simultaneously producing valuable new technologies.

We have no illusions that it will be easy to achieve these twin cultural shifts. Even in the U.S., a disregard for patents is deeply ingrained in parts of certain industries. While respecting intellectual property rights is a cornerstone of some high-tech industries—branded pharmaceuticals, biotech, medical devices, and wireless, for instance—that’s sadly not the case in others, most notably software, computing, and other internet-related sectors. These “winner takes most” industries impose extreme competitive pressure on young firms to increase their market share by any means necessary, even copying the ideas of others. To this day, some software and internet companies take the very narrow view that “saving” money on patent licenses (by infringing) is good, because it frees capital for expansion.

Not helping matters, some large tech-hardware companies treat patents as a defensive weapon to be used mainly in retaliation against any competitors that sue them for infringement. This strategy of mutually assured destruction usually resolves itself in cross-licensing or a stalemate, but the effect is not benign: It breeds a disdain for inventors. And because universities and individual inventors don’t have the power to play this game, some companies just flat out stiff them. All in all, such behavior tends to dissuade inventors from working in these areas and to impoverish our system of invention.

When I’m attacked as a patent troll, it’s usually by people from these special interest groups, who don’t feel they have to respect others’ patents. At a business conference recently, the CEO of a big technology company whom I know pretty well came up to me and said, “So I guess you must be planning on suing me.”

I responded, “Well, no. But why do you ask? Are you planning on cheating me?”

He laughed and said, “Yeah, that’s probably right.”

The funny thing is, we have never sued anybody to defend our intellectual property rights. While I don’t rule it out, I see it as a highly undesirable recourse for several reasons: It’s expensive, it’s unpredictable, and it takes years.

There are always organizations and people who feel threatened by change and loudly oppose it with fearmongering and false predictions of doom. We’ve seen it before. Once upon a time, venture capitalists were called “vulture capitalists” for taking companies away from founding entrepreneurs. Early private equity firms were tarred as “barbarians” and “predators” for threatening the cozy world of inefficient corporate management. Over time both groups came to be seen as positive forces in the economy—and so will invention capitalists.

There are signs that this is happening:

- The number of court battles over patent infringement in the U.S. peaked in 2004 and has since declined. As invention capital firms make it easier for inventors to get paid for their inventions and for companies to reduce their litigation risks and acquire rights to broad bundles of useful technology, lawsuits should decline further.
- IT companies, which historically haven’t bothered to patent many of their inventions, are filing many more patent applications each year. (Microsoft is now one of the top patent filers in the world.)
- Technology companies are starting to come to us for inventions that could help them solve pressing problems.

For these reasons, I’m not concerned that the so-called patent-reform movement in the U.S. will seriously hinder our progress. The effort, led by a lobbying group for large tech companies, hopes to weaken patent rights because it sees patents primarily as a source of liability. But the other side—made up of companies like General Electric, Procter & Gamble, 3M, DuPont, and Caterpillar, which rely on patents as fundamental business assets—are pushing back strongly. In general, the courts have protected intellectual property rights, and Congress is likely to act accordingly, making some needed reforms but not weakening the patent system overall.

## **Building a Professional Industry**

Another obstacle to creating a robust capital market for inventions is one that all complex systems face in their early days: the need to achieve a critical mass of key players. The current market for inventions is illiquid, opaque, and dysfunctional. Few of the existing players—from technology development companies, brokers, and agents, to investment funds, auction houses, and exchanges that specialize in intellectual property—operate at large scale, and

frankly, the quality of their work varies enormously.

As we and others supply a critical mass of expertise, more liquidity, greater pricing visibility, and a better set of options for inventors and patent users alike, I believe the market will start functioning well and will then grow rapidly. Indeed, our purchases of patents have already fueled a noticeable increase in the number of patent brokers in the market. In time, new companies will spring up to fill the many niches of the invention ecosystem. We will see a more intricate and efficient invention industry populated by professional patent finders and packagers, appraisers and underwriters, financiers and sales agents—and other roles not yet conceived.

For our part, Intellectual Ventures aims to be the first full-service invention capital firm. Like venture capital and private equity firms, we raise money from investors, create assets ourselves (by sponsoring inventors), and buy assets from others who would have trouble monetizing them effectively on their own. We actively manage those assets to maximize their value and then provide exit strategies to realize that value.

Our 650 employees include scientists and engineers, patent analysts and attorneys, finance experts, and licensing sales agents. To raise capital, we have an investor relations team. Our topic generation teams continually study trends in technology development and new discoveries in science to try to identify the best opportunities for investment. Their conclusions guide three distinct groups. The first is our in-house invention effort, which involves 30 staff inventors (myself included) and a roster of more than 100 extraordinary consulting inventors who work part-time for us. The second is our external inventor network of more than 1,000 inventors in seven countries. The third is our acquisitions group, which buys existing patents or stakes in them.

## Creating inventions from scratch.

I cofounded Intellectual Ventures with Edward Jung, a colleague at Microsoft who is now our chief technology officer. As inventors ourselves, we were extremely interested in finding more efficient ways to create high-quality inventions. We wanted to build a company similar to Thomas Edison's highly productive lab—Edison invented the invention capital model of raising money by promising investors a certain number of patents per year—but with one big difference. Edison built his lab around one person: himself. Many of the great geniuses of the nineteenth century worked at Edison Labs, but not for very long. We're trying to build a scalable invention company that is not dependent on any one person. The reason is not just that we want our company to produce many more inventions in many more areas than Edison Labs did. It's also that we believe today's complex problems can best be solved by getting brilliant people from different disciplines together to tackle problems in a systematic fashion.

Accordingly, we've hired scientists and engineers who already had impressive track records for inventiveness in a wide range of technologies. We've also signed up world-class researchers in academia and industry as consulting inventors. This gives us the ability to make strong contributions in about 50 areas of technology, from medical devices to software to consumer electronics to nuclear engineering.

A typical team might consist of 10 inventors—for instance, some physicists, a surgeon, a chemist, some programmers, an expert in digital imaging, and engineers. Needless to say, such people don't ordinarily work together. We hold invention sessions in which we focus teams on solving specific problems (such as reducing infection rates in hospitals) or ask them to brainstorm about how new scientific discoveries (such as metamaterials with electromagnetic properties not found in nature) might be applied to solve real-world problems.

This cross-disciplinary approach is remarkably effective at generating creative solutions to tough problems. Lately, for example, we have been working on new ways to combat malaria, a disease that every year sickens hundreds of millions of people and kills nearly one million children. Our invention sessions—involving biologists, computer scientists, physicists, epidemiologists, and other experts—have yielded numerous promising approaches. One is a pest-control system that was inspired by military technology for shooting down ballistic missiles. (Some of our inventors were scientific leaders in the **“Star Wars” program**.) Our system uses inexpensive, low-power computers, cameras, and lasers to identify female mosquitoes (the males don't carry the disease), track them in flight, and blast them with a crippling pulse of light. It may sound far-fetched at first, but we built a prototype in our lab, and it works. A similar approach could be used to protect organic crops—or even people at backyard barbecues—from pests.

One series of invention sessions we held brought highly respected heart, chest, bone, and brain surgeons together with many of our staff inventors. We asked the doctors to draft “wouldn't it be great if...,” or WIBGI, technology wish lists, which generated exceptionally productive discussions. We came up with new designs for surgical tools that are self-sterilizing or that can snake their way around delicate areas of the brain rather than passing through them. We

invented novel ways to make implantable devices that can intelligently dispense medicines where and when most needed in the body; smart shunts for draining excess fluid, which can signal when they are clogged or can actually clean themselves; bone screws that can be adjusted remotely, using a wireless power source; and tiny implants that can automatically monitor the blood glucose levels of diabetics. Not bad for a couple of weeks' work.

Another invention session resulted in a revolutionary kind of nuclear reactor that all but eliminates the need to enrich uranium. Because enrichment technology can also be used to make weapons, our designs could vastly reduce the risk of nuclear proliferation.

We produce thousands of inventions a year this way. Each idea gets vetted and prioritized, and then we file for patents on the best one-fifth to one-third of them. In 2009, we applied for about 450 patents for in-house inventions, placing us among the top 50 filers in the world—ahead of far larger companies such as Boeing, Johnson & Johnson, 3M, Mitsubishi, and Toyota.

### **Cultivating an inventor network.**

In parallel to our in-house invention process, we have within the past two years invested roughly \$100 million in our external network of inventors. The inventors are for the most part academics, and our deals are usually with their institutions. For example, last year the Indian Institute of Technology in Mumbai selected our company to help it commercialize inventions produced by its faculty and staff.

Inventors in the network receive what we call “requests for invention” that outline challenging technical needs and point to fruitful avenues for them to pursue. They then submit ideas for evaluation. Our firm issues cash payments for the most promising submissions and also files patents. The inventors and their employers get a share of any royalties that materialize. By late 2009 our network had produced some 4,000 invention ideas and more than 1,000 patent applications.

### **Investing in existing inventions.**

Even as robust as our network of talented inventors is, it could never supply enough inventions for our funds. So we have purchased most of the 30,000-plus patents in our portfolios. In doing this, we strive to expand the market by offering inventors new or better options for profiting from their work. Our acquisitions team of business strategists studies the patent holdings of our existing and potential customers, identifies their technology needs, and does its best to assemble portfolios that fill those needs. Appraisers and buyers evaluate inventions on the market and decide whether and how much to bid for them.

One significant source of patents is the archetypal solo inventor. Many such inventors have no interest in writing a business plan or building a company; they prefer to just hand off their invention to a licensee and move on to the next great idea. Investment firms like ours spare them the work of tracking down and negotiating with lots of potential licensees separately, and we can almost always give them a fairer deal. We've paid about \$315 million so far to individual inventors, making us one of their largest sources of new capital.

Universities and nonprofit research organizations are a second source of inventions for us. A surprisingly large amount of IP produced in academia lies fallow because the institutions lack the resources to fully develop its business potential. Smaller academic institutions in the U.S. and many universities outside the U.S. are often unable to fund a technology transfer office. The institutions that do have such operations peddle only a small fraction of their inventions—typically those that were created entirely within their walls and can be easily licensed or sold. That's because when scientists from different institutions collaborate to produce an idea (as is often the case), the ownership of the IP is complex. Schools balk at investing the resources required to structure a deal. Or they may not feel up to the task of monetizing the inventions when there is an array of potential customers, or when customers are likely to disregard their IP rights. An invention capital firm can afford to take on this hard work because it can amortize the fixed costs of large licensing teams over a lot of deals. So far our firm has provided analysis, patenting and licensing expertise, and cash to more than 100 institutions.

Occasionally we take advantage of more serendipitous sources of high-quality patents, such as distressed or bankrupt companies that put their IP on the market, either at auction or directly. In some cases, they are big companies (Enron, for example). But most are small start-ups that failed for reasons that had nothing to do with the quality of their ideas. By providing a ready market for dissolving start-ups and ideas that were ahead of their time, we inject money back into the venture capital system so that it can be used to fund new enterprises. Deals of this kind can also rescue good inventions that might otherwise be lost.

For instance, we recently looked at five medical device start-ups that worked in the same space but are all now in various stages of collapse. Their technology is fine; the current economy will simply not support so many competitors in this area, and venture capitalists are reluctant to give them more funding. We considered a deal to combine and restructure their intellectual property into a larger package that could then be sold to a stronger start-up or to a big company like GE, Baxter, or Johnson & Johnson.

Finally, a good number of the patents we buy come from large, healthy companies: We have done deals with more than 100 *Fortune* 500 companies and their international equivalents.

For many large companies, one of the frustrating things about inventing is that it's unpredictable and can't be controlled. When you set out to tackle one problem, you often come up with something totally unexpected that has nothing to do with your business. Most companies have difficulty exploiting ideas that lie outside their core business.

A functioning capital market would make it easy for companies to monetize such inventions. If invention capital companies are successful in creating such a market, 10 or 20 years from now it will be commonplace for CFOs to ask their R&D people, "Are we spending enough on inventions? Are we selling enough of our inventions?" Instead of being the black hole it is today, research will be a profitable business and a lot more money will be spent on it. In fact, that's one of my goals: to get bigger R&D budgets for everybody.

## Turning Inventions into Money

Other than a handful of technology areas—such as compounds that have potential as drugs—buying, selling, and licensing patents remain difficult. Transaction costs are high. The vast majority of transactions occur behind closed doors, so reliable pricing information to help buyers and sellers gauge the worth of any particular invention is hard to come by.

To create an efficient market that extracts the full value of inventions, market makers must be amply capitalized. And by amply, I mean a lot more than the \$5 billion we've raised to date. But to get investors to provide that kind of money, viable exit strategies—in other words, options for monetizing patents—must be routinely available. Here are a couple of approaches that we're pursuing now and one that is a possibility down the road.

### Package patents.

One way to extract the full value of patents is to aggregate them intelligently so that the whole is worth more than the sum of its parts. We have assembled large portfolios of patents in wireless technology, memory microchips, and other areas. Each portfolio typically contains some inventions that are already being used, some that are highly likely to be used in the future, and some that are much more speculative.

Any one of the patents would have some value, but as a package the value is much more compelling, because customers save the time and expense of tracking down all the patent holders and negotiating separate deals. Customers can easily get all the patents they need to roll out an innovative product faster and at the same time reduce the risk that they'll miss a necessary license and get blindsided by an infringement suit.

Most of our large customers understand this approach and want to license our patents in bundles of 1,000 or more. Many also subscribe to a portfolio so that they will automatically get licenses as inventions are added to it. Our licensing activity has so far earned more than \$1 billion.

That said, constructing such portfolios is far from easy. One of the biggest challenges we face is discerning which kinds of inventions are most valuable to our strategic investors and other customers. Companies are not used to talking about such needs with others. And sometimes they just haven't thought that far ahead.

### Launch a start-up.

Some ideas are so revolutionary that not even venture capital firms will take a chance on them. And occasionally an idea is so good that it would be folly to let someone else commercialize it. In such exceptional cases, an invention firm might launch a start-up.

If an invention is powerful but the market is crowded with players, a joint venture with one of the giants may offer the surest path to commercialization. Partnerships are attractive when developing an invention requires not just substantial capital but industry expertise. For this reason, we're exploring partnerships with multinational energy companies to

commercialize our new kind of nuclear reactor.

## **Create patent-backed securities.**

Successful patent portfolios can throw off a lot of cash, so they could be the financial underpinnings of a new class of investment assets: patent-based securities. Indeed, shares in companies like Qualcomm essentially function this way already. Patent-backed securities would simply create a more direct link between patent performance and security returns.

One can easily imagine that once trading in securities backed by a portfolio of patents began, people would speculate on individual patents that showed unusual potential. Companies with a stake in related technologies—for example, those trying to commercialize them—could use such securities to hedge their bets. This possibility will remain only that, however, until there are ways to value such securities—something that we're working on.

Not so very long ago, professional venture capitalists did not exist. Entrepreneurs had to borrow from their rich uncles or college friends. Then, in 1946, **Georges Doriot**, an immigrant from France who rose to become a brigadier general in the U.S. Army and a Harvard Business School professor, founded American Research and Development Corporation (ARDC) as a vehicle to create and invest in innovative new companies. Doriot switched the primary funding mechanism from debt to equity. Any interested investor could put his money into one of ARDC's funds, and any aspiring entrepreneur could approach ARDC with a business plan. Doriot's scalable model for raising and investing venture capital gave entrepreneurs a standard, predictable way to raise money. Now it's time to do the same for inventors.

Invention is too important to leave it to charity, and I don't see why we have to. Kleiner Perkins, Benchmark, Sequoia, and the other top venture capital firms don't have to go to Congress and beg for a little bit more money for the small company sector. Research in areas like astronomy and fundamental physics that is very long range and has diffuse benefits for society should be funded by the government. But funding the invention of useful technology that can make money in a relatively short period of time—say, 10 years—shouldn't be the government's job. It's the private sector's job. And the U.S., with its combination of research talent, openness to financial innovation, and a culture of inventiveness, is perfectly positioned to be the nexus of this new industry.

What will it take for the invention capital market to come into its own? A group of companies—not just Intellectual Ventures—has to prove the concept. We have to get more people to accept our inventions. We have to vastly expand the number of companies that license our patents. And two or three invention funds need to produce great returns.

A functioning invention capital market and industry can enable inventors around the globe to create hundreds of thousands more inventions each year than are being made today. Sure, some of those inventions will be silly or useless. But what matters is the top 1% that will make our lives vastly richer and better. Create an invention capital market, nurture an invention capital industry, and the resulting virtuous cycle will surely transform the world.

## **What an Invention Capital Market Would Do For: Inventors**

- Provide funding
- Identify fertile topics for invention
- Assess the market for specific inventions
- Establish market rates for inventions
- Provide reliable compensation
- Help produce strong patents
- Market and license inventions
- Bundle inventions from multiple sources to increase their value

## Academic Institutions

- Provide funding
- Match areas of scientific discovery with industry needs
- Structure deals when multiple organizations have a stake in a patent
- Help monetize inventions
- Enforce patent rights

## Product Manufacturers

- Provide one-stop shopping for patents
- Bring together outside inventors to meet company-specific needs
- Lower the risk of lawsuits by providing access to patents
- Serve as a ready market for patents a company wants to license or sell

## Society at Large

- Accelerate progress in technology
- Reduce dependence on government funding for research
- Foster respect for intellectual property rights
- Efficiently recycle good ideas of failed ventures
- Increase competition and consumer choice

**Nathan Myhrvold** is the CEO and a cofounder of **Intellectual Ventures**, a company that makes a business out of invention. He is a former chief technology officer at Microsoft.

Each idea gets vetted and prioritized, and then we file for patents on the best one-fifth to one-third of them. In 2009, we applied for about 450 patents for in-house inventions, placing us among the top 50 filers in the world—ahead of far larger companies such as Boeing, Johnson & Johnson, 3M, Mitsubishi, and Toyota. In some cases, they are big companies (Enron, for example). But most are small start-ups that failed for reasons that had nothing to do with the quality of their ideas. By providing a ready market for dissolving start-ups and ideas that were ahead of their time, we inject money back into the venture capital system so that it can be used to fund new enterprises. Deals of this kind can also rescue good inventions that might otherwise be lost. The solution, he argues in his Harvard Business Review article, “The Big Idea: Funding Eureka”, would be a world in which inventors are encouraged to invent by the presence of investment funds that compete to buy their intellectual property and sell it on—perhaps bundled with other patents—to buyers who know how to put it to good use. Some of those taking part in this market could be industrial companies—Qualcomm, a designer of microchips for mobile telecoms—already does much of what Mr Myhrvold talks about. The idea of raising money to invest explicitly in creating patents is not new, Mr Myhrvold notes: that is what Thomas Edison did. But firms such as his will seek to institutionalise the process so it is not dependent only on a single inventor.