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BY ROB NORTON

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Taiwan Semiconductor Manufacturing Company does it with its co-creation model for helping customers design computer chips, which it then manufactures to order. On the other side, service companies such as Barnes & Noble, Starbucks, and (most famously, with its Kindle) Amazon have found that they must enter the realm of manufacturing to thrive. Chesbrough goes one step further. He argues that successful product-service hybrids embrace a new kind of innovation, combining “open innovation” (moving outside the organization’s own boundaries) and services. Hence the title of his new book: *Open Services Innovation: Rethinking Your Business to Grow and Compete in a New Era* (Jossey-Bass, 2011).

Chesbrough, professor and executive director of the Program for Open Innovation at the Haas School of Business at the University of California at Berkeley, established himself as a leading voice with an earlier book, *Open Innovation: The New Imperative for Creating and Profiting from Technology* (Harvard Business School Press, 2003). He was the first major academic champion of the open innovation idea, which has made a great difference at Procter &

Economists debate whether a service-based economy can be truly robust — or whether prosperity depends on having enough of a manufacturing base to support service businesses. But what if this turned out to be a false dichotomy? That’s the question raised by innovation expert Henry Chesbrough. All successful manufacturers, in Chesbrough’s view, need to come to terms with a fundamental change: the accelerating flows of knowledge and information that are shortening product cycles and com-

moditizing their products. They can do this, he says, only by reinventing themselves, not as pure manufacturers or service providers, but as hybrid product-service companies that design their business models around creating more meaningful experiences for their customers.

Of course, many manufacturers are already doing this. General Motors does it with its OnStar system; General Electric does it with its infrastructure financing; Ikea, Apple, Inditex (Zara), and many others do it with their own retail outlets; and

Gamble, Unilever, and many other companies. Open innovation can be defined as revitalizing a company's future by tearing down the walls between its R&D organization and outside companies and innovators. Chesbrough recalls that when he first considered the book title in 2003, he Googled the phrase and got only a couple of hundred links, most of them to articles on topics such as the opening of new innovation facilities. "There was no real usage of the term *open innovation* at that time," he says. "When I did that same search last summer, I got 13 million responses, and most of them were really about this new model of innovation."

Now Chesbrough argues that the fortunes of advanced companies — and of economies as a whole — will depend on how well they rethink services. His analysis began several years ago as he considered the fact that service-based industries were rapidly supplanting manufacturing-based industries — in developed economies in general, and in the U.S. economy in particular. Today, he points out, services account for roughly 60 percent of economic activity in the top 40 world economies, and fully 80 percent in the United States.

Services, in this context, doesn't mean such small-scale activities as providing haircuts or washing cars — or even conventional large-scale services such as accounting and retail businesses. Instead, Chesbrough has a vision of knowledge-intensive infrastructure and product lines that

evolve into "the engine of growth for the entire developed world." Breaking out of the old manufacturing-based, product-centric mold, Chesbrough says, will be challenging for business leaders, because it requires them to think of their customers not as purchasers of goods, but as co-creating partners in an evolving relationship. Companies that master new service innovation models and build or add the requisite new capabilities, he promises, will be able "to reach levels of success they have never before experienced in their market or their industry."

Chesbrough discussed the background and implications of his work with *strategy+business* at his office in Berkeley in February 2011.

S+B: How did your idea of open services innovation evolve?

CHESBROUGH: It began with thinking about the idea of the commodity trap. Richard D'Aveni at Dartmouth wrote an excellent book about the phenomenon [*Beating the Commodity Trap: How to Maximize Your Competitive Position and Increase Your Pricing Power*, Harvard Business Press, 2010]. He captures something important: the difficulty — given the globalization of manufacturing and, increasingly, the globalization of innovation itself — of sustaining a competitive advantage. If you are focused on making a better product that you drop in a box and ship, and it's up to the customer to figure it out from there, I think you have a very, very hard time staying ahead of your competitors for

very long in today's environment. That was the motivation.

I trace the evolution of the cell phone in some detail in the book as one illustration. Commoditization is why Motorola had difficulties earlier on and Nokia is having them today. Today you have handsets coming from companies like HTC in Taiwan, and Samsung and LG in Korea, and many others, and you can imagine there will be handsets coming out of China and other places. Everybody understands how to do total quality management, enterprise resource planning, and all the methodologies of Six Sigma, so the things that let companies differentiate themselves and make better products have now become very widely distributed. It makes it harder and harder to sustain a good margin if you're not simultaneously providing opportunities to wrap experiences around the products that you're making. And these don't have to be your own services, either; they can be others'.

If you look at the iPhone, iTunes, iPad — the whole "i" empire that Apple has built — they haven't done it alone. They've done it with hundreds or thousands of apps makers alongside them, much as Microsoft did with Windows in the 1980s and '90s, when they had, at one point, something like 75,000 independent software vendors working on Windows.

That's the way products become platforms, and I think that's where companies of all kinds need to end up, so that they're not just making a

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product or a providing a simple service. The right way to think about it is, “How do I turn what I have into a platform?” And a platform, on the one hand, attracts others to build alongside and on top of what you’re doing, but on the other hand allows you to provide a much wider set of experiences. I go into some detail in the book about both the economies of scope and the economies of scale that a company can gain from being more open in services innovation. I think this is where you can continue to make money and escape that commodity trap.

S+B: In the early days of the Macintosh, Apple was famous for restricting innovation to a system it tightly controlled — and thereby limiting the market for its computers. What they’re doing now with the “iFamily” seems like quite a change.

CHESBROUGH: The earlier history of Windows and the Mac is instructive. There were some lessons learned by Steve [Jobs] and others: that as good as you are, there are too many other smart people out there, and by cutting yourself off from them you really shoot yourself in the foot. But I don’t think they truly anticipated just how explosive the “iStore” apps

sector was going to be, because really, there was nothing like it out there prior to this. To give Apple credit, they were able to keep up with the explosion. Their models opened up to accommodate the demand. By the time they launched the iPad in 2010, one of the things they were banking on was that because there were so many apps out there, the iPad could hit the ground running. And they were right; I think they sold 3 million units in the first 90 days after its introduction.

By doing that, they also put the new companies coming out with Android tablets and Android tablet apps at a disadvantage. We’re beginning to see a good library of Android apps become available, but even today it’s not as extensive as the Apple ecosystem. Although I’m sure the time is coming when it will fully catch up, and there will be wonderful stuff.

S+B: What are some other examples of how being open can provide scale and scope?

CHESBROUGH: Amazon illustrates both. On the scope side, being open allows them to give more choices to customers. Amazon allows third-party merchants to use the same

tools that Amazon uses to build their own Web pages; the third parties can build the Web pages on Amazon so that the user gets an exactly consistent experience, whether you’re buying books that Amazon sells or jewelry for which Amazon will take your money, but the actual merchandising and fulfillment is done by a third party.

The user gets a consistent experience; Amazon gets the money in advance, so they get that nice cash flow. And for the merchant, Amazon is one of the most heavily trafficked sites out there, so the merchants are going where the customers are. Amazon just had a great quarter in terms of revenues, and the third-party merchants’ revenues were up even more than Amazon’s own internally provided merchandise. Amazon is really benefiting from more of the customer’s share of wallet, so to speak.

On the scale side, Amazon is also interesting because it has to make huge investments to build the extensive server infrastructure to handle all the transactions. And Amazon has been criticized for a long time, especially by security analysts, who say, “Hey, you’re a retailer, why are you spending all this

money on R&D and capital investment? When are you going to take your foot off the gas, and give it back to the shareholders?” And instead, Amazon has built this major server infrastructure, and created a new business called Amazon Web Services that hires out that infrastructure to other companies. You can

that compete with Amazon Web Services are those like Google and Microsoft and IBM and a very small number of companies that see these capabilities as fundamental to the cloud computing platform of the future. But Amazon got there long before others did, because they thought about their business much more

firms can get more value and more growth from their core capabilities. But the highest and best use of these capabilities is in open innovation approaches to constructing business platforms. These platforms induce others to invest their time, money, energy, and ideas in extending your initiatives. As they do, your platform becomes more attractive to more customers, while becoming more profitable and sustainable for you.

As others invest their time, money, energy, and ideas in extending your initiatives, your platform becomes more profitable for you.

have your website hosted by Amazon Web Services and you only pay for what you use. So if your business is not going well, you're not getting a lot of traffic, you only pay Amazon a little. If your business starts to take off and you get a lot of traffic, you've got to pay Amazon more money — but your business is taking off, so you've got the money to pay. And you don't have to put your own equipment in the ground, hire people to manage it, and all the rest. Amazon is world-class in managing that stuff, and the chances of you hiring people who are as good, and being able to keep that up at the level of availability that Amazon has, are for all but a handful of companies very low.

So companies like Barnes & Noble have essentially given up; they don't even try to compete on these things. And the companies

broadly than as just being a focused online bookseller.

Being open allows you to get economies of specialization; that's your path for gaining both economies of scope and economies of scale. If Amazon hadn't been open either to the third-party merchants in the first case or to letting others use its infrastructure in the second case, it wouldn't have gotten all this. Open services innovation is a key part of how Amazon makes all this possible.

S+B: How does openness lead to economies of specialization? What's the link?

CHESBROUGH: Like innovation in products and technologies, innovation in services benefits greatly from specialization. By using open services innovation to harness the forces of scale and scope economies, services

“Real Men Have Fabs”

S+B: Talk about some of the other examples of open services innovation from your book, like Taiwan Semiconductor Manufacturing Company (TSMC). It's not a business you'd obviously think of as a service business. In fact, within the Internet economy, semiconductors are as close to a “big-iron” manufacturing industry as you could think of.

CHESBROUGH: That's right. Real men have fabs [wafer fabrication plants]. In the early days of the computer industry, up to the early or mid-1960s, if you wanted to build semiconductor chips, you had to design and build the systems into which the chips went. So IBM, AT&T, NTT in Japan — the major systems companies of that era — had captive semiconductor manufacturing operations. Then along came companies like Intel in the late 1960s, which created chips that were designed to be IBM mainframe replacement chips. Under the model these companies developed — integrated device manufacturing — you

no longer needed to design the entire system to design better chips, and these companies could provide customers with 10 times the performance for about the same cost. This

company wanted to design chips, it had to make investments in wafer fabrication plants to build them, so starting a chip company was very capital intensive. The designs weren't

companies to design their chips, and TSMC uses tools to verify that the design works, and then it builds the chips.

In its most recent incarnation, TSMC has announced what it calls its open innovation platform — TSMC's words, not mine, but of course I love the term. They're not only opening up the manufacturing, but the designs as well. They sell references, process technologies, and methods, and share their intellectual property (IP) in how to do all this well. In other words, TSMC not only creates its own intellectual property to support its manufacturing of these chips; it also invites third parties that have their own specialty design tools to provide their intellectual property to TSMC, and TSMC essentially sells it for them. So now you can actually get paid when companies use your tools to design their chips.

And the open innovation platform takes all of this intellectual property, both TSMC's and the third parties' IP, and lets them test it and validate it. When customers use these processes, TSMC will guarantee that they'll get their chip through production the first time without any mistakes. Errors can add signifi-

Taiwan Semiconductor is an example of how intellectual property can create and capture value, even in a services context.

was a really strong value proposition, and it launched the so-called fair children: the companies launched by Fairchild Semiconductor engineers, such as Intel, National Semiconductor, and Motorola's semiconductor operations.

By the 1980s, engineers at TSMC were able to separate the manufacturing of the chip itself from the design of the chip, and they developed "the foundry model." This is essentially a services model. TSMC provided its clients with manufacturing services from its foundries: The clients designed the chips and took the designs to TSMC, and TSMC built the designs into chips. Prior to this, if a

cheap, but the real costs were in the manufacturing.

By taking over the manufacturing job, TSMC enabled the rise of a lot of so-called fab-less chip startups. They could develop really good chips, but they didn't have to make the investments in manufacturing. They could hire the manufacturing for only what they needed, for the volumes they had. They didn't have to fill an entire factory. This was a big step forward in terms of the business model, because it allowed many new companies to enter the business with much lower capital requirements. It's a high-tech kind of co-creation: Chip designers use tools from TSMC and independent

cant costs, and can slow production by weeks or months. So TSMC really provides some peace of mind and assurance, plus a faster time-to-market. The whole system is a way of aggregating third-party and internal IP alongside the manufacturing services.

There are quite a few other companies providing foundry services now, but TSMC still has about half of the market by market share. When you've got a great new process, tool, or reference design, usually the first place you would go is the biggest guy in the market. So this is a case where the big do get bigger, and it becomes a very powerful advantage.

S+B: In other words, being first with their open innovation model gave TSMC a hard-to-beat competitive advantage.

CHESBROUGH: That's right. They brought the foundry model into the market I think in 1987 or thereabouts. But since then, a lot of other companies have come into that market as well, so they have to keep that advantage by continuing to move forward. TSMC is now raising the ante by offering to test and validate the assortment of tools and processes, many of which come from outside companies, that go into the chips' designs. But because of their testing and validation, you the customer don't have to worry about how to make all this work for you; they've done that work for you.

It's an example of how you really can build a sustainable advantage

even in a services business. The normal knock on services is that these things don't have a lot of intellectual property protection. Patents are less commonly used in services, and services are not always standardized — there's always subjectivity. And any of us can undergo the experience and then reproduce it, so services are easy to copy. TSMC is an example of how IP can create and capture value, even in a services context. By developing its own IP for designing and verifying chips for its customers, and creating published interfaces and validation for third-party designs, TSMC has been able to build an enduring advantage.

S+B: Another example you give of excellence in service innovation is Xerox. This might be surprising to some people, since Xerox is most often cited as a company that lost its way as an innovator.

CHESBROUGH: I've been studying Xerox for more than 12 years, and I have documented in some detail some of their challenges, particularly those involving the Palo Alto Research Center. Their technology spin-offs, like the graphic user interface, [created] a lot of value for other companies like Microsoft and Apple, but not much for Xerox itself. Those are the stories you're referring to. But one thing that I've learned from Xerox is that a big, established company can generate a fundamental business model innovation. For the first 40 years of its life, Xerox sold its copiers and printers as products. Sure, it charged for toner, pa-

per, and service, and also for financing the purchase of its products, but those items were secondary to its business model (except eventually for toner, which became a key source of profits).

Today, however, it has an entirely different model: Instead of selling copiers and printers, it is offering a service it calls Managed Print Services, in which you pay only for what you use, by the copy or by the page. Xerox takes over all the management and maintenance of the equipment and keeps all the toner stocked, the paper in the machines, and all the rest. It's a very different way for its customers to obtain copies. It's a deceptively simple idea, but it's devilishly difficult to execute.

It's a terrific arrangement from the customer standpoint. Your competitive advantage is not in which copier you buy; you want copying services, and you're more than happy to have somebody take care of that for you, because if you yourself are running your own copiers in your own organization, that's usually very much a backwater kind of job. So the career paths at Xerox in Managed Print Services are far better than the career paths that Xerox's customers can provide to people doing the same function.

It's also beneficial for Xerox, for many of the reasons I go into in my book. One is that Xerox knows more about copiers and printers than even the most sophisticated of its customers. Its specialized knowledge allows it to manage resources more effec-

tively. Another is that Xerox can develop, install, and operate the most efficient equipment over the life cycle of print services, which can generate big savings. Finally, Xerox manages all the customer's print devices under these arrangements — not just those that it manufactures — so it gets a better view of the customer's overall copying and printing needs. This gives it a learning advantage over its competitors.

The Footprint of an Idea

S+B: Your first book on open innovation attracted a lot of interest, judging by the amount of media attention it's generated and the number of other books, magazine articles, papers, and conferences that refer to the phenomenon. Is it being put into practice by managers?

CHESBROUGH: In terms of what companies are actually doing day to day, it's moved pretty far pretty fast in some industries — for example, in consumer packaged goods. Virtually every major consumer products company I know has an open innovation program going on. I would say it's taken off pretty quickly in the IT sector as well. In other sectors, like transportation, it's taking a long time. Financial services is also relatively slow, although that industry has been in such turmoil, it's hard to make a simple statement about it.

In every organization that I've worked with, it doesn't come easily. There are tremendous internal barriers to doing it well. Some of those barriers are cultural in nature; some, I think, reflect the logic of the reward systems that companies have in place. And even if the company wants to embrace open innovation and some people actually start the

process, there are a lot of things that they don't realize until they get into it.

A good example is the internal legal staff, which is charged with keeping the company out of trouble and out of court, making sure that it has ownership for what it sells, and trying to reduce risk. Along comes this idea of open innovation, and suddenly you're bringing in external ideas and taking internal ideas outside. Ideas are flying beyond the boundaries of the firm, and it may not be clear what the best legal arrangements are to enable this. On the one hand, you want to keep the company from being contaminated when you bring external ideas in,

that of other management innovations, like, say, Six Sigma?

CHESBROUGH: Open innovation is maybe eight years old. The ideas behind Six Sigma started in the U.S. and were widely ignored, and then some people in Japan got very interested and embraced the idea. Then, and only then, did Six Sigma come back into the United States. And my sense is that all of this was a 20- or 25-year process.

One thing that the Six Sigma folks have done that has not been done in open innovation is translating the general concepts — of statistical process control, the philosophy of doing it right the first time, eliminating waste, and so forth — into

I think services really are much more important for building competitive advantage than Porter's value chain would suggest.

so you're not inadvertently selling things you don't have the right to sell. On the other hand, when ideas go to the outside, you need to make sure that the arrangements are structured in such a way that you participate in some of the revenues and opportunities that come along.

These things can all be resolved, but legal people tend to be very uncomfortable with the idea, and they haven't had a lot of examples and successes to look at as models. These are the kinds of barriers that companies encounter. In the industries where open innovation is really starting to take off, I see that changing.

S+B: How would you compare the progress on open innovation with

specific steps that you can take on a day-to-day basis. Those became the curriculum for the Six Sigma program. To my knowledge, that curriculum does not exist at this point in open innovation.

For open innovation to really have legs, there's got to be a community of people, both in industry and in academia, promoting it. One of the things I've done, with a colleague at San Jose State, Joel West, is to create an open innovation site (www.openinnovation.net), where we're trying to create both a portal for information for industry managers and also a set of resources — case studies and academic journal articles, as well as other materials for academics — all in one place. I

think the things that eventually made Six Sigma so prevalent will grow out of initiatives like this, where the community has a place to come look at all the work being done, and then from that can begin to build the methodologies that will get us to a certification kind of approach.

S+B: What about in academia? One of the striking things, reading the examples in *Open Services Innovation*, is that many of them — Taiwan Semiconductor, for example, as well as some of the others that focus on services at big companies — are not the examples you encounter in the standard works of the MBA curriculum.

CHESBROUGH: Open innovation is making some inroads in business schools. At Berkeley, I teach this in the elective part of the MBA program. But when you get into our core strategy classes, these ideas are not yet in the core — and I think that's how these things always start out.

One of the things I talk about in some detail in the book is contrasting the value chain that Michael Porter introduced in *Competitive Advantage*, which is product-driven, with an open services value

chain. Porter's value chain was an extremely important concept, and it's still the standard taught in the MBA classroom when we think about strategy. But when you look at the diagram that illustrates it, you find that services is this little piece at the very end of the process, and it's not the basis of competitive advantage. Competitive advantage is in the product side; that's where you make the money.

I think that's an outdated conception. I think services really are much more central and much more important for building competitive advantage than Porter's value chain would suggest. So in that sense I agree with the premise of your question. I don't know if it'll be five years or 15 years, but we'll be teaching these things in the core MBA curriculum before too long. And I have tried to populate the book with lots of examples from a number of different industries so that people understand this is not simply a view of "how do you innovate in a particular sector or a particular industry?" It's actually already quite widespread in many, many different areas. +

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