

Unlocking the Value of a Technology Portfolio

Commercializing a New Technology

General managers in charge of new product launches may face a number of vexing questions: Why were we beaten in the market by competitors with inferior technology? Why are our newly commercialized technologies producing weaker than expected financial results? Why do our technology successes seem increasingly fleeting?

The classic dynamic at work here is the failure to jointly design the product and the business. Successful businesses address customers' underlying economics and decision-making processes, not just their technical requirements. The key to commercial success lies in understanding these customer requirements as well as industry dynamics in order to design the business as shrewdly as you design the product.

Why has the iPod dominated the digital music environment, and the BlackBerry prevailed in the market for wireless handheld devices? How has Corning Inc. driven a corporate resurgence since 2002? The key to each of these successes goes far beyond the company’s products and lies in the business designs surrounding their technologies.

The half-life of new technologies is increasingly short. Competitors can quickly catch up to, or even leapfrog, the early market leader. As a result, the traditional focus of technology-based companies on engineering and product development—building the functional features and making such classic tradeoffs as size versus weight versus power—no longer guarantees success. Think about the relatively quick demise of the Iridium global satellite phone or the Sony MiniDisc.

Nevertheless, most technology-based firms still work with a limited playbook of business designs. When a technology is pronounced “market ready,” responsibility typically shifts from scientists to a general manager who seeks to monetize the innovation. The default move tends to be the application of a previously successful business design to the emerging innovation, much as a brand manager might approach the launch of an improved consumer product. When only a fraction of a company’s innovation investment is directed toward designing and testing potential business designs to surround the product, the company often fails to

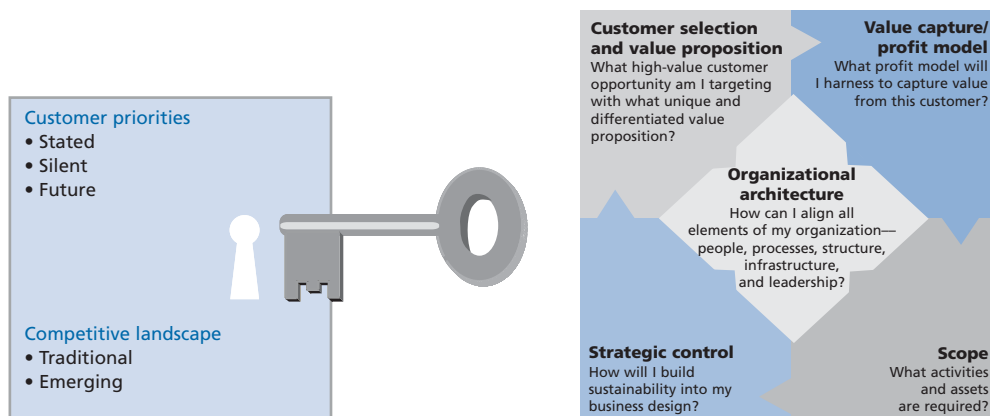
capture the full value of the technology, or to earn an optimal return on the R&D investment.

In contrast, companies that are most successful at commercializing technologies recognize that new innovations often require new business designs. Applying business design thinking along with rigorous market analysis to the launch of a new technology dramatically increases the odds of commercial success. Business design, as shown in Exhibit 1, defines a set of linked choices about:

- Which high-value **customers** to serve, and with which **value propositions**
- Which **profit models** to employ to capture value from those offerings
- What **scope of activities** to perform in-house, and what to outsource
- How to create **strategic control** or sustainable differentiation
- How to create the right **organizational architecture** to deliver the overall offer

Making insightful choices along these dimensions requires general managers to develop a detailed perspective on the market environment in which a new technology will compete. To this end, the most fruitful areas to investigate are:

Exhibit 1 The components of business design



- The Value Migration® process: To which business designs are industry revenues, profit, and shareholder value flowing?
- **Customer needs and priorities:** How and why are priorities shifting? What current and emerging needs are not being met by existing offerings?
- **The economic neighborhood:** Where are the attractive “white spaces” of economic activity in both a firm’s industry and adjacent industries? What are the key segments, and how valuable are they?
- **The value chain:** How is the industry structured? Which value chain steps are most profitable? Which could offer strategic control?
- **Competitive dynamics:** Where are competitors playing along the value chain? Which existing or emerging business designs are most powerful?

Only by doing the hard work to develop answers to these and related questions do leading innovators consistently achieve commercial success. To understand why answering these business design-oriented questions drives a more effective approach, consider how three companies—Apple, Research In Motion, and Corning—have raised their odds of success.

Apple’s Monetization of Digital Music

The white ear buds on airplanes and in health clubs are ubiquitous now, but the success of the iPod was by no means a foregone conclusion. The product has been praised for its elegant design and interface, its relatively large memory capacity, and its unique click wheel control. However, the iPod was not first to market, its early models had inferior battery life, and the noted click wheel feature was copied by competitors. Any technical advantages the iPod had were fleeting.

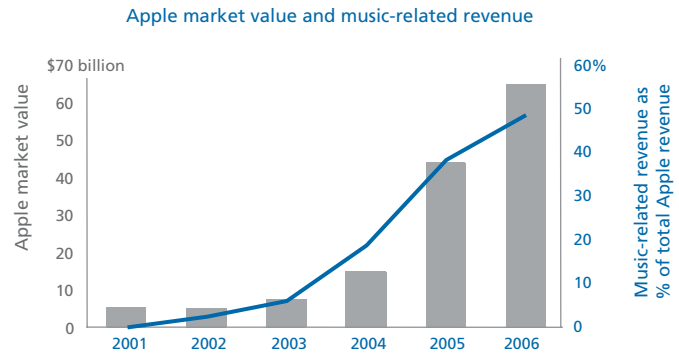
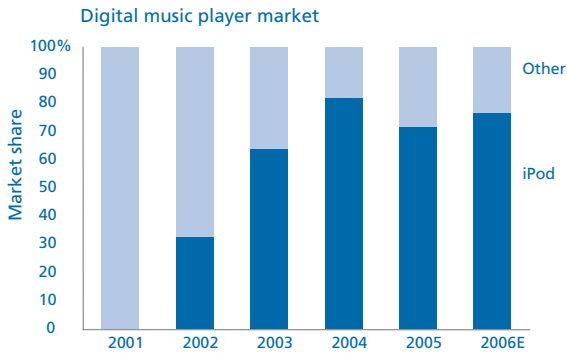
What has made the iPod wildly successful relative to MP3 offerings is a business design that provides a complete digital music experience. While its competitors pursued either a device-approach focused on MP3 players or a music store-approach focused on downloadable songs, Apple provided an integrated offer of hardware (iPod), software (iTunes music library), and content (iTunes music store), as shown in Exhibit 2. This powerful business design creates high switching costs for customers who become more tied to the iPod-iTunes system with each song downloaded and high barriers to entry for competitors expected to match Apple’s seamless offering.

Five years after the launch of the first iPod, the expanded family of iPod products continues to dominate digital music while also making inroads into video and telecommunications.

Exhibit 2 Apple’s integrated business design has created a self-reinforcing cycle for its customers and high barriers to entry for its competitors.



Exhibit 3 Apple's commercial success



Source: Apple 10K reports, Credit Suisse, SG Cowen, Forbes, Business Week, Bloomberg.com, International Business Times, Compustat, Oliver Wyman analysis.
 Note: Digital music player market share numbers for 2006 are estimated based on Oct. 2006 year-to-date data.
 Note: Apple market value calculated using monthly closing stock price and shares outstanding at the end of each fiscal year (Sept.); Apple annual revenue data represents Apple's fiscal year (Oct.-Sept.).

Many companies offer feature-laden MP3 players and have attempted to duplicate the customer experience, but Apple's business design has driven unsurpassed loyalty and disproportionate share of wallet (Exhibit 3). Is the iPod story a case of first-mover advantage? No. Great product design? Partly. But that's not the whole story. The iPod would likely have achieved just a fraction of its success without the business design focus on an integrated music experience.

Research In Motion's Conversion of the CIO

If the person next to you isn't listening to an iPod, chances are good she is tapping away on a BlackBerry. BlackBerry's success is evidence that business design thinking is equally important in business-to-business markets.

Research In Motion launched the BlackBerry in North America in 1998. In contrast to the Palm TREO, its only true competitor at the time, the BlackBerry had a scroll wheel and a QWERTY typewriter keyboard. More importantly for its target corporate customers, the BlackBerry system offered secure connections, synchronization with standard office email programs, and support for custom-built Java applications.

The North American rollout of the BlackBerry and the evolution of its business design proceeded in three distinct phases (Exhibit 4). In the first phase,

from 1998 to 1999, RIM initiated a sales campaign targeted at Fortune 500 IT departments, with a focus on gaining acceptance of the technology. RIM understood that winning over the IT gatekeepers was imperative to mass corporate adoption. As a result, the company's early value proposition was a pilot program, offering free trials of the BlackBerry to demonstrate its functionality within a corporate IT environment; RIM established more than 1,000 such programs.

In the second phase, from 2000 to 2002, RIM shifted gears and launched a mass-market campaign focused on increasing penetration within large corporate customers. RIM used its own sales force, provided both the BlackBerry Enterprise Server and the handheld devices directly, bought and resold network airtime, and maintained all technical and customer service functions in-house.

In the third phase, beginning in late 2002, RIM adjusted its business design once again as it sought out partners to achieve greater scale while focusing on its key sources of strategic control. Specifically, RIM still markets to large corporate customers, develops custom solutions, sells the BlackBerry Enterprise Server, and works with IT departments to install and maintain the secure connections on an ongoing basis. But it has partnered with telecommunications carriers such as Verizon to sell the BlackBerry handhelds to the same large

Exhibit 4 BlackBerry's business design evolution

	1998-1999	2000-2002	2002-Present
Customer selection	<ul style="list-style-type: none"> Fortune 500 IT departments 	<ul style="list-style-type: none"> Fortune 500 enterprises 	<ul style="list-style-type: none"> Corporate and personal users
Value proposition	<ul style="list-style-type: none"> Secure wireless email Custom application support 	<ul style="list-style-type: none"> Wireless communication Increased productivity 	<ul style="list-style-type: none"> Always "connected" Status symbol
Value capture	<ul style="list-style-type: none"> Free "pilots" to introduce device to market 	<ul style="list-style-type: none"> One-time device and server sales Ongoing service fees 	<ul style="list-style-type: none"> Server and solutions sales Ongoing service fees Royalty fees (from carriers)
Scope	<ul style="list-style-type: none"> Develop and market devices Outsource manufacturing 	<ul style="list-style-type: none"> Develop and market devices Outsource manufacturing 	<ul style="list-style-type: none"> Deliver corporate solutions Outsource billing, customer service, and consumer sales
Strategic control	<ul style="list-style-type: none"> Strong bond with corporate IT departments 	<ul style="list-style-type: none"> Early mover with limited competition Technologically superior 	<ul style="list-style-type: none"> Installed base Brand strength
Organization	<ul style="list-style-type: none"> BlackBerry sales force 	<ul style="list-style-type: none"> BlackBerry sales force 	<ul style="list-style-type: none"> Carrier sales force (devices) and BlackBerry sales force (servers)

Sources: BlackBerry.com, The Wall Street Journal, Fortune, Business 2.0, Financial Times, Oliver Wyman analysis.

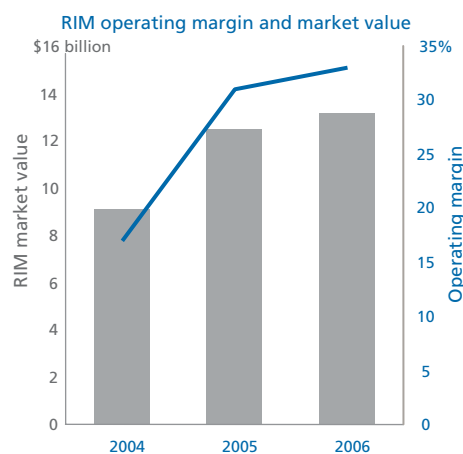
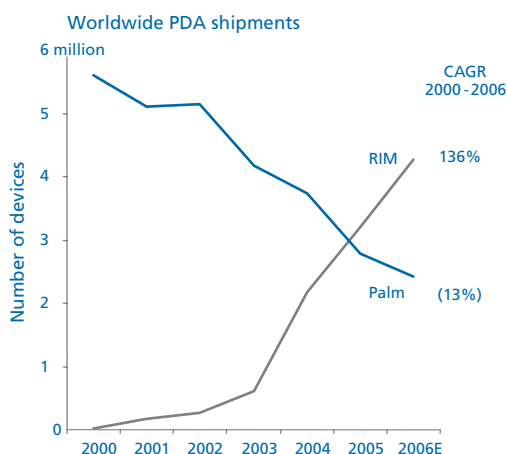
corporate customers and to handle all device-related customer service needs and billing.

As a result of this multi-phased business design playbook, RIM grew its subscriber base from 25,000 users in 2000 to 4.9 million in 2006. In 2005, RIM surpassed Palm in the number of handheld devices shipped worldwide. In fiscal year 2006, RIM generated \$689 million in operating income on revenue of just over \$2 billion (Exhibit 5). Today, RIM is focused on leveraging its established relationships

with corporate IT departments (its primary source of strategic control) and is enabling other brands of mobile devices to connect to the BlackBerry wireless services platform that has become a de facto standard.

As the iPod and the BlackBerry examples illustrate, new product success requires building a complete business design to surround the technology. Apple and RIM understood their target customers' priorities well, and spent significant time tailoring their

Exhibit 5 RIM's commercial success



Source: RIM Annual Report, BlackBerry.com, Rim.net, Yahoo Finance, Oanda, Gartner Research, Oliver Wyman analysis.

Note: PDAs include all handheld devices that are not cell phones. Note: Worldwide PDA shipment numbers for 2006 are estimated based on actual data for the first three quarters of the year and company statements.

Note: RIM market value calculated using monthly closing stock price and shares outstanding at the end of each fiscal year (Feb); annual data represents RIM's fiscal year (Mar-Feb). Operating Margin is defined as Gross Margin minus R&D Expenses minus Selling, Marketing and Administration Expenses.

offerings to address specific needs—making technical tradeoffs (the QWERTY keyboard) and crafting the experience (the iTunes music library). They also identified the sources of strategic control (the total music experience, the secure side of the corporate IT department) and followed a multi-year playbook to build a position of strength over time.

Corning's Systematic Success through Business Design Thinking

The iPod and BlackBerry are examples of developing the appropriate business design to surround a specific new product. Corning Inc. provides an example of integrating business design thinking into a company's processes over time.

In 2000, Corning was riding high on the strength of its telecommunications business, with a roughly 40% share of the global market for optical fiber. That year, the telecommunications business accounted for approximately 70% of Corning's \$7.1 billion in revenues, institutional shareholders were pushing the company to divest its non-fiber businesses to create a pure play, and the stock climbed to a high of \$113 per share. When the Internet bubble burst and the telecommunications sector collapsed, Corning's fiber sales dropped sharply, credit rating agencies downgraded the company, and the stock plummeted to \$1.10.

Jamie Houghton was called out of retirement to return to his previous role as CEO and to help turn around the company. The recovery that he and his team engineered was built on a dramatic restructuring of the telecommunications business, a return to a more diversified technology portfolio, and increased attention to business design thinking.

In the wake of this organizational change, the businesses housed in the Corning Technologies division became, by default, critical to the company's future. Liquid crystal display (LCD) glass, diesel emissions management, and drug discovery tools needed to be developed into much more substantial and sustainable drivers of Corning's economics. As a result, Corning began to think differently about building

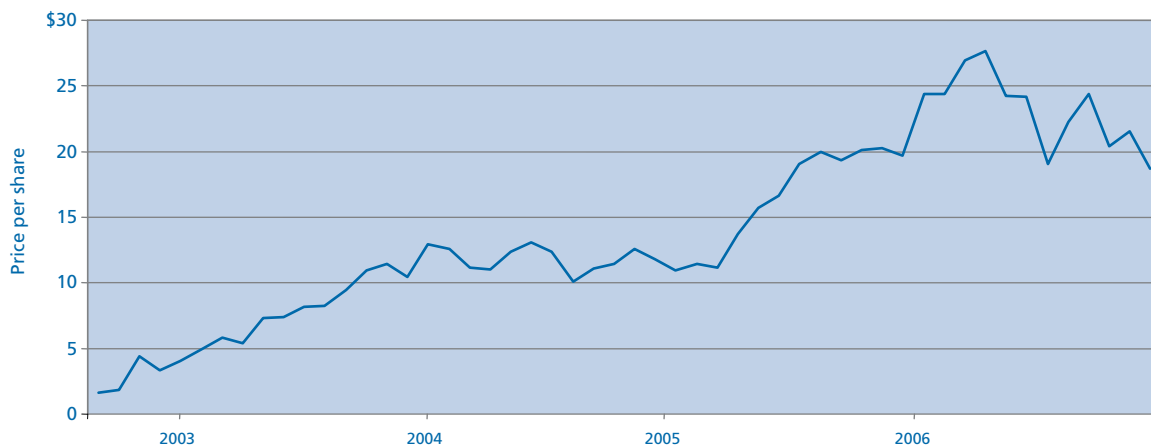
and managing businesses through the technology lifecycle, and seeking sources of strategic control beyond the traditional ability to invent and patiently develop "keystone components."

Corning paid particular attention to two key business design elements: developing unique value propositions and designing effective profit models. Historically, Corning often relied on the strength of its technical products to win over customers. This shifted as new businesses were built in the Corning Technologies division, and the company systematically engaged customers much earlier in the development process. For example, in the diesel emissions market, the company collaborated closely with its OEM customers, including partnering with Volkswagen to introduce a new type of honeycomb filter. Similarly, in the drug discovery area Corning developed and tested Epic, a new technology that uses light waves instead of fluorescent dyes to identify promising drug candidates, with multiple major pharmaceutical companies.

Corning also began to develop innovative profit models to help mitigate the impact of industry cyclicality. For instance, in the LCD arena, manufacturers of flat-screen panels co-invest in Corning's new glass fabrication plants by paying in advance for future glass shipments under long-term supply agreements.

Corning's R&D, at a spending level of roughly 10% of revenue, remains a critical driver of success. But the company has also instituted new business processes to enable commercial success, including a company-wide growth and strategy council. This council convenes monthly to manage both the technology and business aspects of innovations moving through the pipeline but still years from market introduction. As a result, Corning now defines itself not only by its ability to consistently generate breakthrough technologies, but also by its ability to surround those technologies with the right business designs. That difference is reflected in the increase in the company's share price since 2002 (Exhibit 6).

Exhibit 6 RIM's commercial success



Source: Yahoo! Finance Note: Price per share is adjusted for dividends and splits.

Designing the Product and the Business

As the experiences of Apple, RIM, and Corning illustrate, the most successful technology-based companies surround their technologies with innovative business designs. They identify and collaborate closely with the most valuable customer segments to understand their priorities and to develop targeted value propositions. They employ powerful profit models. They develop distribution strategies that ensure that go-to-market channels are properly aligned and have the right incentives. Finally, they build several sources of strategic control and follow multi-year playbooks to strengthen the business.

Apple, RIM, and Corning are still outliers in the technology landscape. Most companies spend the vast majority of their innovation investments—funding, staff time, and other resources—

on technology development. Only a fraction of corporate investment is dedicated to testing and developing the right business design for commercial success—and the process typically starts late, after the options have begun to narrow.

In order to succeed on a sustained basis, technology-based companies should implement business design thinking alongside the R&D process while there is still time to influence the technical tradeoffs and go-to-market choices. This may sound like radical change. But it's actually far less risky than defaulting to a standard business design without testing other options that could be better suited to customer priorities and industry dynamics. Surrounding new technologies with pressure-tested business designs can dramatically enhance the odds of commercial success. ❖

Questions for Managers

- Which customers will matter most for a successful launch of your next technology? Do you understand how these customers create value in their own businesses, and how your technology can help?
- Will your innovation disrupt, or require changes to, the industry value chain? How will you convince other players to collaborate?
- Have you considered at least three different business design options to take your next technology to the customer?

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Oliver Wyman is building the leading global management consultancy, combining deep industry knowledge with specialized expertise in strategy, operations, risk management, organizational transformation, and leadership development. The firm works with clients across a range of industries to deliver sustained shareholder value growth. We help managers to anticipate changes in customer priorities and the competitive environment, and then design their businesses, improve their operations and risk profile, and accelerate their organizational performance to seize the most attractive opportunities.

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