

Manufacturing Innovation



Transforming Manufacturing Product and Service
Innovation With People, Process, and Technology

Abstract

The ability to find, create, and capitalize new product and service ideas sets highly successful manufacturing companies apart, especially in complex, fast-moving global markets. Many experts have written on the subject of innovation and suggested critical success factors, some of which have been proven through experience. To sustain a high level of innovation, successful companies bring together people, process, and technology and look beyond their walls for expertise and ideas. Cisco is widely recognized for its ability to continuously launch highly innovative products in its core markets, as well as enter or create new markets. The company has also assisted other manufacturers in implementing a technology infrastructure and adapting people's work habits and processes to use these technologies. The result is faster, more successful research and development that produces a flow of innovative new products over time for sustainable competitive advantage. Collaboration platforms, virtualization, unified communications, and other powerful network-based technologies have moved beyond early adopters, and the business benefits achieved indicate that companies who do not adopt these methods will fall behind competitors who do. In this paper, we will draw on recent literature and company case studies to highlight the dimensions of innovation success most critical for manufacturing companies, and suggest people, process, and technology capabilities needed to transform a manufacturer's ability to innovate.

The Innovation Imperative

During the worst global recession in decades, manufacturers focused on cost cutting, retaining customers, and operating a lean supply chain. As economies recover, future market leaders are making bold strategic moves to gain share. Manufacturers must be positioned to satisfy the increasingly complex needs of customers globally. In addition, growth in competition has driven reduced margins and an imperative for shorter new product introduction cycles. Investments in the ability to speed development and create more targeted products and services will position individual manufacturing companies to fully capitalize on economic growth, improve margins, and fundamentally strengthen long-term competitive position.

Innovation is novelty that creates value for customers and society as a whole. It's something unique, and in the context of a manufacturing business, product and service offerings that serve customer needs better, creating differentiated experiences for customers, competitive advantage, and improved revenue and margins. Innovation can be sustaining to maintain a lead in an existing market, or disruptive to create new markets or fundamentally change the elements of competition.

Even though innovation is recognized to be very important to commercial success, only 38 percent of U.S. companies and 32 percent of European companies report that their innovation efforts yield a steady stream of results.¹ Many aspects of the business,

markets, and ecosystem impact a company's ability to innovate successfully. People, process, and technology both internal and external to the company must all be engaged to work together for successful innovation. Advances in technology and lowered costs have made best practices in new product development practical for a wide variety of manufacturers. In fact, Jeremy Siegel of Wharton has written that we may be entering a "golden age" of innovation as a result of these network-based technologies. In this paper, we will outline manufacturing innovation best practices as proposed by experts and implemented by Cisco and our customers, and suggest achievable enhancements to business capabilities that position your organization for ongoing innovation and commercial success.

Cisco's Innovation Model

According to the annual *BusinessWeek* Survey, Cisco remains among the 20 most innovative companies in the world. The company is also singled out by The Patent Board as the world's best in the communication industry, with a Technology Strength score more than sixteen times the industry average. Cisco has extensive experience combining people, process, and technology to drive innovation and works with companies across the globe to enhance their ability to bring new products and services to market successfully.

Figure 1: Dimensions of Successful Innovation
(Source: Cisco IBSG, Arun Saksena, 2009)



Cisco faces the same imperative to develop new features, products, markets, services, and delivery methods that other manufacturers do. The company has created a world-class, differentiated innovation capability using an open approach to sourcing new ideas; an innovation-focused, collaborative culture; extensive use of collaboration tools; and an organizational structure that nurtures both sustaining and disruptive innovations. In comparing Cisco and other manufacturers' experience to ideas put forward by experts in the field, some key dimensions emerge as well as a set of three supporting foundation elements (Figure 1).

¹ Managing Automation, "The Innovation Gap," 2008.

The Dimensions of Successful Innovation for Manufacturers

Based on internal experience and customer success, Cisco has identified a number of dimensions critical to sustainable, profitable product and service innovation for manufacturers.

Pragmatic

The drive for innovation should be pragmatic, with goals for commercial success. Bruce Henderson, the founder of the Boston Consulting Group, wrote 30 years ago that the majority of new products are cash traps and will absorb more cash over their lifetime than they will generate. Innovation certainly has noncash benefits, including brand enhancement and organizational strength, but for most companies the proof is in the revenue, profit margin, and competitive advantage that innovation creates over time.

Cisco's vision is to cultivate a steady stream of new businesses with billion-dollar potential that will create a growth engine opportunity. Cisco uses revenue goals and ROI tracking to direct research and development. The company has created councils and boards to speed decision-making on ideas and reduce the time it takes to resource and deliver high-potential projects. Cisco has even established a special business unit for emerging technologies that nurtures new ideas and tracks ROI. This business unit has already launched multiple billion-dollar businesses for Cisco.² Another manufacturer, Whirlpool, whose goal is to achieve 20 percent of revenue from new products, puts ideas to the test with a three-page scorecard on expected revenue, technical feasibility, relevance to the brand, and market trends.³ This helps ensure that new products have the capability to be successful, with revenue and profitability as the final measure.

As the authors of *Payback: Reaping the Rewards of Innovation* from HBS press stated, "Successful innovation can only be defined as profitable innovation."⁴ Tracking return on new product development processes requires a governance structure to evaluate the success or failure of programs, as well as the ability to gather and share information and metrics across globally distributed teams. In turn, this requires a technology infrastructure to capture, publish, and protect this information.

Customer-Centric

Innovation that is customer-centric and meets explicit and/or implicit customer needs has the best chance to be successful. Products developed with the customer in mind have a clear value proposition and a strong opportunity to sell well when introduced. Also, understanding customers better than competitors do builds sustainable competitive advantage.

Achieving customer-centric innovation is not a natural consequence of R&D spend. A study published in the *Harvard Business Review* concluded that "even companies that spend the most on R&D remain starved for both customer innovation and market-capitalization growth." They go on to describe how customer-centric

Key Innovation Dimensions

- **Pragmatic.** A focus on converting "ideas into cash" (revenue growth and profits).
- **Customer-centric.** Discovering and serving customer needs, both explicit and hidden, to create a differentiated customer experience.
- **Open.** Cast a wide net to capture the best ideas from internal and external sources, and the capability to capitalize on them.
- **Holistic.** Innovation isn't just about technology or a new product, but also your brand, operating environment, employees, the impact on your business ecosystem, and the impact on society.
- **Controlled experimentation.** Creating a culture that encourages organizations to experiment, rapidly prototype new ideas, and learn and capture new knowledge.

innovation propels the innovation effort out to the people who are on the front line with customers.⁵ Most manufacturers, however, have traditionally done research and development on new products "at headquarters." Communication with sales and service personnel was infrequent, and field collaboration rare.

A joint study by Infosys and *The Economist* in 2007 showed that key drivers for customer loyalty are faster innovation and concept to market, product co-creation, and enabling customer intimacy. This is consistent with both Cisco and Cisco customer experiences. By creating products, services, and delivery models that delight customers, manufacturers can build customer loyalty and create competitive advantage that drives higher margins.

Cisco has long focused new product efforts on ensuring customer success. For the Cisco® Integrated Services Router (ISR) project, Cisco involved field personnel and conducted extensive focus groups, incorporated customer feedback, and created an easy-to-use and -upgrade product that yielded a differentiated customer experience. Proctor & Gamble, a Cisco customer, is another excellent example of a company that puts the customer at the center of innovation (see case study).⁶

Customer focus starts at the top—John Chambers places customer success and satisfaction at the core of Cisco's business strategy. Many of the company's innovations come from understanding customers' needs and ongoing dialogue with lead customers during product development. The company takes great care in placing Customer Satisfaction metrics front-and-center and

2 "Innovation at Cisco," Arun Saksena, Cisco IBSG, July 2007.

3 "How Whirlpool Puts New Ideas Through the Wringer," *BusinessWeek*, August 3, 2009.

4 Harvard Business School Press, *Payback*, Andrew and Sirkin, 2007.

5 *Harvard Business Review*, "Manage Customer-Centric Innovation Systematically," Selden and MacMillan, 2006.

6 Harvard Business School interview with A.G. Lafley, CEO of P&G, as posted on YouTube <http://www.youtube.com/watch?v=xvIU5Xrffc>

Case Study: Proctor & Gamble

Proctor & Gamble (P&G) is widely known as a formidable marketing and brand management company, and one with enormous depth and breadth in product technology and innovation. With over 138,000 employees in more than 80 countries, P&G sells in more than 180 different countries and has one of the largest and strongest portfolios of trusted brands. The company holds more than 24,000 active patents worldwide, and is granted, on average, about 3800 new patents each year.

Approach to Innovation⁷

P&G puts the end consumer at the center of all innovation. They engage the end user from the beginning, immediately after they get the idea. The company co-creates, co-designs, and co-develops products with the eventual users.

Best Practices⁷

- Start with the customer.
- Have a simple process for gathering ideas.
- Engage the end consumer immediately with simple concepts and prototypes.
- Work collaboratively. Successful innovation is a team effort.

Technology Enablers

- Video collaboration using TelePresence
- Web portal for idea submission and collaboration with innovation partners

incorporating these as performance dimensions for all employees. For both Cisco and its customers, this leads to win-win sales processes, customer loyalty and sustainable competitive advantage.

Customer-centric innovation requires an organization and culture that value and actively pursue customer input, processes to gather and incorporate input, and the ability for globally distributed teams to interact with customers and understand their needs. In turn, this requires a technology infrastructure that facilitates collaboration between design teams and a global customer base, centralizes information for team access, and protects sensitive customer information.

Open

Henry Chesbrough, Executive Director of the Center for Open Innovation at UC Berkeley, coined the term “open innovation” to describe how companies look outside their walls for new ideas.

⁷ Harvard Business School interview with A.G. Lafley, CEO of P&G, as posted on YouTube <http://www.youtube.com/watch?v=xv1USxXrffc>

And, A.T. Kearney concluded in a recent report that, “No single company is large enough or inventive enough to be an innovation leader without collaborating with an array of partners...companies that profess best practices in innovation produce nearly half of their innovations from ideas generated outside the company.”⁸ However, a recent Manufacturing Automation poll shows that even today 45.9 percent of new ideas come from just a few individuals. With increasing globalization of design teams and markets, diversity of thinking is critically important, and more future products and services will come from ideas generated outside a company’s four walls.

In Cisco’s experience it takes 1000 feasible ideas to yield just 20 viable business opportunities.⁹ As a result, the company uses an open innovation model to capture ideas from everywhere. This flow of ideas provides the fuel to expand existing markets and create new ones. By encouraging a healthy culture of competition among different business units for the best investment opportunities, Cisco ensures that different groups are always looking for great opportunities, whether from inside or outside the company. Many other manufacturers have also successfully implemented open innovation initiatives. Here are just a few examples:

- GE SupportCentral, an early professional networking platform for GE workers to search for people with needed expertise and access a shared storage system for files and documents.¹⁰
- Dell IdeaStorm, where users can go to vote on ideas for new features or products.
- P&G Connect & Develop, which allows potential contributors to browse current P&G innovation needs or to submit innovative ideas.
- www.innovatewithkraft.com, a platform for collecting ideas and inventions to create winning business propositions that “delight our customers”.
- Innocentive, spun out from Eli Lilly, has created an online platform to connect seekers (those with difficult research problems) with solvers through shared workspaces and defined governance and IP ownership structures.

What do they have in common? Incentives for people to be open to outside ideas; processes to manage outside linkages and external intellectual property; and the network-based technology, such as online collaboration tools and shared workspaces, to connect the right resources inside and outside the company.

For many companies, capturing and capitalizing on those ideas is still a challenge. To start, governance structures that manage the flow and analysis of ideas must be put in place, with a clear

⁸ As quoted in *Industry Week*, “Kraft Crafts an Open Innovation Strategy,” Jill Jusko, December 1, 2008. A. T. Kearney report title “Open Innovation: the next frontier in innovation management.”

⁹ Cisco IBSG, “Innovation Advantage: A Cisco Case Study,” Arun Saksena, 2007.

¹⁰ ZDNet, “GE’s Enterprise Collaboration Backbone,” Oliver Marks, July 17, 2008.

understanding of the ownership of the intellectual property and the products, packaging, and services that result. In addition, companies need the tools to capture ideas from internal and external sources and a collaboration platform to allow dispersed teams to bring ideas to fruition effectively.

Holistic

Holistic innovation looks beyond technology alone to include novel ideas in any aspect of the business system. Scott Anthony, Managing Director of Innosight Ventures, wrote on his blog at harvardbusiness.org, "In my mind, an innovative company does more than exploit a single idea. It develops the systematic ability to extend into new markets, and create entirely new business models. And importantly, it doesn't just invent new things; it makes money with its new efforts."

Cisco practices holistic innovation through stated goals for combining product, service and delivery elements to create entirely new solutions that meet complete customer needs. The Apple iPod is also very illustrative of holistic innovation. The hardware itself is unique, but the human interface design, business model around iTunes, and the seamlessness with which the device works with other devices (such as laptops) take it far beyond other offerings in the marketplace. Another leader in this area is Ideo, whose concept of "Design Thinking" balances "Desirability" to customers, "Business Viability," and "Feasibility." Ideo focuses on the whole experience for end users, and uses a collaborative, iterative approach to innovation.

To support holistic innovation, companies need governance structures to help manage pieces of the whole solution, many of which are provided by partners or related businesses. Collaboration and information-sharing tools are required for owners of different aspects of the offering to work with customers and other contributors to develop a seamless solution. The ability to see customers interacting with the solution, ask questions in real time, discover and manage requirements, and collaborate with global design teams to integrate the pieces are all critical to success.

Controlled Experimentation

Julie Sequeira of Innosight writes that, "experimentation is an important element of emergent strategy that offers innovators the opportunity to test key assumptions early and get the information needed to move forward more efficiently and effectively." Companies that innovate successfully focus on early prototyping and constant feedback.

At Cisco, rapid prototyping is a critical part of R&D. The company even has a Chief Demonstration Officer, highlighting the importance of showing and trying real solutions with customers rather than simply creating diagrams or PowerPoint slides. Cisco manufacturing partners are encouraged to compete with each other for prototype and production volume business based on speed, quality, and price. Another manufacturer, General Electric, whose tagline is "imagination at work," is a Cisco customer that takes an "experiment and learn" approach to innovation, encouraging employees to try

Cisco ISR 9000 Project

Global New Product Collaboration

- 400+ engineers
- Across 7 global locations
- Tight time-to-market deadline
- Strict budget constraints
- Extensive use of online video collaboration

Results

- Saved US\$10 million in development costs
- Launched product globally at one-tenth the usual cost
- Improved employee engagement and morale
- Achieved fastest revenue ramp in company history

new ideas. They have adopted a "reverse innovation" approach to develop and test new ideas in emerging markets, and take the most successful ones global, dramatically changing the competitive landscape in developed markets.¹¹

Former barriers to experimentation, such as expensive prototypes and expensive travel to bring together global design teams, customers and manufacturing personnel for reviews are either gone or rapidly disappearing. Prototyping has become much faster and cheaper through the use of new 3D printers and breakthrough ideas such as the FabLab (fab.cba.mit.edu/). Using video collaboration, online collaboration tools, and interactive whiteboarding with IP-enabled smart boards and shared workspaces, globally dispersed teams can participate in real time in prototype reviews and watch end users interact with prototypes. These same tools can be used to help resolve potential production issues to bring products to market faster and with fewer quality issues.

The Foundation for Successful Innovation

In addition to the elements described above, Cisco has identified the organizational foundation critical to sustainable, profitable product and service innovation for manufacturers. To succeed, the innovation dimensions must be supported by people, process, and technologies—an organization and culture that encourage innovation, appropriate business processes, and a technology infrastructure for seamless collaboration.

Organization and Culture

How a company is organized and its culture impacts its ability to innovate. A Bureau of Labor Statistics study in 2007 concluded that companies with decentralized decision-making, broad information sharing and incentive programs are significantly more

¹¹ Vijay Govindarajan, "How GE Does Reverse Innovation," *Harvard Business Review*, October 23, 2009

likely to create successful product innovations!¹² Developing a culture that nurtures innovation is often challenging. As David Kester, CEO of Design Council noted in his interview with Harvard Business Digital, creating a culture that allows innovation to take place has to come from the top.¹³ At Cisco, John Chambers is the key champion and he believes, “Committing your organization to a culture of innovation is the best way to embrace the opportunities the future holds.” Similarly, at Proctor & Gamble, top executives are very engaged in the process of evaluating and executing on new ideas. They hold regular reviews of new product projects, ensuring teams have the resources they need, have made progress since the last review and setting direction and goals.¹⁴

Organizational elements that foster innovation, based on Cisco and Cisco customer experience:

- **Focus on the customer.** Cisco reports customer satisfaction scores on their internal website, right next to the stock price.
- **An environment that encourages risk-taking, experimentation and learning.** As the authors of *Payback* note, “Leaders and companies that will not take enough risk will never be able to achieve payback through innovation.”¹⁵
- **Collaboration.** Cisco includes the ability to work effectively in a cross-functional environment as part of the evaluation process for employees and leaders. The company also actively eliminates organizational barriers by utilizing pools of development resources led by “Core Teams.” These Core Teams include senior members from across the organization, including design, operations, product management, materials, quality control and suppliers, to collaboratively develop and launch new, innovative products.
- **No technology religion.** Cisco follows a “build, partner, invest, or acquire” approach. Decisions on which path to follow are based on an assessment of the individual needs of the opportunity, not on past technology decisions.
- **Reward systems.** Rewards don’t have to be monetary. Offering money alone can actually impede innovation. 3M, for example, relies largely on peer recognition to reward innovation. “In addition to peer recognition, 3M celebrates success stories and propagates tales of innovation and contribution,” notes Kimberley Lopez, Knowledge Management specialist at the American Productivity and Quality Center (APQC). “The stories about great inventors, such as Art Fry, become legends at 3M.”¹⁶ 3M grants the “Technical Circle of Excellence” award to key innovators selected by their coworkers. Similarly, Cisco bestows the “Cisco Pioneer Award,” which recognizes teams within Cisco that drive development in the critical areas of product and core technology.

Cisco’s Collaborative Product Lifecycle Management Process

- **Identify the business or market opportunity.** Make informed decisions by connecting stakeholders inside and outside the company, each of whom may have a different understanding of the customer and market requirements or business strategy.
- **Architect the solution.** Engage engineers from various technology domains with customers to ensure needs are understood and addressed.
- **Develop and test.** Bring together global design teams to understand and agree to product specifications.
- **Launch.** Connect Cisco employees and partners to subject matter experts and needed information to make critical decisions to avoid delays.

These organizational elements must be supported by business processes and a technology infrastructure that encourages contribution of ideas, collaboration to develop those ideas and find the best solutions, and systems to capture, share, and reward innovation.

Business Process and Governance

Sustaining and disruptive innovations often require very different approaches for success. Sustaining product changes are normally handled by the existing engineers through standard processes with relatively short-term goals. Disruptive ideas, however, may even threaten existing businesses and thus require separate resources and a longer-term time horizon. To loosely paraphrase Intel’s Andy Grove, if you don’t eat your own lunch, someone else will do it for you.

At Cisco, the “command and control” model is starting to give way to a more collaborative approach that is more conducive to nurturing innovation. Cross-functional business councils guide long-term strategy, enable cross-business-unit collaboration, and influence the direction of investment in existing products and services to sustain competitive advantage in those areas. Cisco’s Emerging Technologies Group (ETG) is charged with disruptive innovations and “blue ocean” (untapped) market opportunities. The ETG follows an internal capital model that is practical and outcome-oriented, with a goal of one new business unit per quarter and an overall success goal of 75 percent. Similarly, General Electric changed its business model to take advantage of innovative ideas in developing markets. By setting up “local growth teams,” GE placed local resources but connected them to GE’s world-class technology centers. Thus the teams were able to take advantage of GE’s vast technical resources to solve local problems and create unique new products.

¹² Bureau of Labor Statistics, “Workplace Organization and Innovation,” Zoghi, Mohr and Meyer, May 2007.

¹³ Harvard Business Publishing interview with David Kester, January 2009. On YouTube: <http://www.youtube.com/watch?v=KyqHGdlMcas>

¹⁴ Harvard Business School interview with AG Laffley, CEO of P&G, as posted on YouTube <http://www.youtube.com/watch?v=xvIU5xXrffc>

¹⁵ Harvard Business School Press, *Payback*, Andrew and Sirkin, 2007.

¹⁶ American Productivity and Quality Center, “Rewarding Innovation,” Paige Leavitt.

Setting up business models to capitalize on different types of innovation requires setting up multiple business units and creating governance structures for them, but also the ability to manage resources globally. Scarce resources need to be allocated effectively across projects. From the technology side, product lifecycle management software and a process for creating a consistent business model globally are very important, as well as information sharing, data security, and collaboration infrastructure.

What We've Learned

Business Capabilities for Innovation

As the above examples show, sustainable, profitable innovation for manufacturers requires enhancing a number of basic business capabilities, summarized in Table 1.

Processes, organizational culture, and the technology to support them are key enablers of innovation. Highly innovative firms improve the efficiency of information flow and create opportunities and incentives for people inside and outside the company to collaborate, knowing that the best results are achieved by a diverse set of contributors and the best ideas or solutions often come from the most unlikely places.

As the above experiences have shown, enhancements to business capabilities should be viewed as cross-project and enterprise level. Alan MacCormack, Associate Professor at Harvard Business School found in his study of global collaboration that successful companies made *strategic* decisions (emphasis his) to invest in collaboration technologies, funded outside the budgets of individual projects!¹⁷ The tools and processes should be reusable infrastructure that can be tapped repeatedly across the globe.

Table 1: Business Capability Enhancements for Innovation (Source: Cisco IBSG, Arun Saksena, 2009)

Business Capability	Potential Enhancements
Governance framework for product strategy and innovation portfolio management	<ul style="list-style-type: none"> • Clear understanding of IP ownership for ideas from a variety of internal and external resources • Better and faster decisions on idea selection, screening, and prioritization ("working on the right projects") • Improved innovation project portfolio management
Data and information management	<ul style="list-style-type: none"> • Improved creation, storage, and sharing of design data • Global and secure access to product and project information • Collaboration and communication tools that allow individuals to access, share, and discuss information in real time • Improved information visibility and the ability to reuse existing design information and knowledge assets • Up-to-date and meaningful product and innovation process and management metrics
Resource management	<ul style="list-style-type: none"> • Better identification of internal and external resources by area of expertise and skill sets • Easy and personalized access to geographically dispersed resources • Efficient assignment and management of a global pool of innovation resources (virtual subject matter experts) • Ability to scale scarce engineering and design resources effectively and efficiently • Encouraging collaboration and innovation through appraisal and reward systems
Project management	<ul style="list-style-type: none"> • Improved ability to manage global projects and programs through the better management of individual project activities and tasks • Ability to implement a 24-hour design engineering environment • Improved project planning tools and stage-gate processes • Improved ability to collaborate internally and externally during the innovation process

¹⁷ Harvard Business School, "Innovation through Global Collaboration: A New Source of Competitive Advantage," Alan MacCormack, August 14, 2007.

Next Steps

To move toward more sustainable, profitable product and service innovation:

1. First, evaluate whether your company is innovating as well as it could.
 - Where are ideas coming from, are they mostly internal and from a few individuals or a small, dedicated R&D team?
 - In the last five years, how many of your new ideas were sustaining for existing product or service offerings, and how many were disruptive, either creating new markets or changing the competitive landscape?
 - Do you have clear goals for new product introductions? Are those goals focused on customer needs and profitability?
 - Are your employees able to tap needed resources and information regardless of location?
 - Are global customer requirements understood during the development process, and are customers and field teams collaborating with designers on new products?
 - Do your new products solve the whole problem for the customer, or just a part?
 - How early in your product development cycles do you identify key requirements, areas where customer expectations are not met, technology feasibility issues, or cost constraints? Have you recently launched a product that did not meet revenue goals?
 - Who is responsible for the success of innovation in your company?
2. Based on the evaluation, identify business and technology gaps:
 - Business processes that don't encourage collaboration and information sharing
 - Lack of involvement from customers and partners in R&D processes
 - Inability of global teams to work together effectively
 - Inconsistent tools, systems, and processes in different geographies, particularly remote offices
 - Resources assigned ad hoc and not available to projects where they could be most effective

- Lack of well-understood procedures for creating and protecting intellectual property
 - Resources underutilized due to a lack of an expertise directory or effective search capability
3. Create a plan to fill identified gaps:
 - Organizational changes
 - Process optimization
 - Governance frameworks
 - Technology infrastructure

The Time Is Now

Although much has been written about the importance of innovation, truly successful companies in this area are still scarce. Highly innovative companies don't happen by chance. Companies must create the business processes, organization and culture, and technology infrastructure that form the foundation for innovation. Effective network-based technology tools are a critical component required to support innovation business processes, nourish an innovative culture, and accelerate product development to sustain a high level of innovation. Companies that fail to make innovation habitual in their organizations and fail to make strategic investments in the required technologies will likely be eclipsed by competing firms that do. Drawing on the experiences of Cisco and other manufacturers—aligning people, processes, and technology infrastructure for innovation—supports a competitive advantage that other firms cannot easily follow, improving profitability on new products and maintaining a stream of innovative new products and services over time.

For More Information

To learn more about manufacturing innovation, please visit www.cisco.com/go/manufacturing.

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