Winning With Open Process Innovation

When manufacturers develop a process innovation, they frequently seek to keep it under wraps. But that's often not the best approach.

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MOST RESEARCH ON open innovation has focused on the use of ideas and knowledge from outside the organization in the development of products and services. But openness can be useful for process innovation, too. Our research shows that manufacturers can benefit substantially when they look for ideas beyond the factory gates, especially when their operations are already advanced.

We often meet managers in manufacturing companies who keep process innovation activities tightly under wraps. Some see their processes as a source of competitive advantage that should not be shared with anyone. Others consider them organizational knowledge that could be detrimental to expose to outsiders.

Some companies have good reasons for keeping process innovations concealed. For example, a combination of process and product innovation often jointly results in competitive advantage for a company. If you have found a unique production process with which to manufacture a differentiated product — for example, a new metal alloy or a medicine — it can be wise to keep that know-how within the company. In such cases, there is an obvious risk of loss of intellectual property.

However, our research suggests that for many manufacturers, such defensiveness deprives companies of a valuable source of ideas for productivity improvement. We draw our conclusions from an analysis of nine years of survey responses from 1,000 Swiss manufacturers, as well as 200 interviews with personnel at the Volvo Group (AB Volvo), a manufacturer of trucks, buses, construction equipment, and marine and industrial engines that is based in Gothenburg, Sweden[1]. One of the authors also visited 45 Volvo Group factories around the world.

Even for an industry leader, walling off process innovations from the outside world can be a losing strategy, because sooner or later, competitors usually catch up[2]. As counterintuitive as it may seem, our research suggests that most operations managers can build greater advantage for their company by following a policy of open process innovation rather than secrecy. However, evolving from a closed culture to an open one is not easy, and it generally requires taking six big steps.

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[1] Note that AB Volvo, the Volvo Group, is not the manufacturer of Volvo cars. Volvo Car Group is owned by the Chinese company Zhejiang Geely Holding Group Co. Ltd.

[2] E. v. Hippel and G. v. Krogh, "Open Source Software and the 'Private-Collective' Innovation Model: Issues for Organization Science," Organization Science 14, no. 2 (March-April 2003): 209-223.

1. Open up internally.

Most large global manufacturers encourage their factories to share innovative practices and success stories with one another. The best ideas that emerge from this sharing become part of the overall corporate program. Empirical evidence shows that sharing process ideas has a profoundly positive effect on operational performance[3]. Companies that already do this informally can extend the process improvement activities with a systematic effort inside their factory networks. In this way, they gain some of the advantages of open innovation without the risk — while laying the groundwork for other open information sharing about processes.

This tends to work well. Because the factories belong to the same "family," their operations and contexts are usually comparable. This means the hurdles for implementing novel ideas are often lower than when technology or knowledge stem from outside the network. Through open process innovation within the company, the factories lift the productivity bar *together*.

For approximately 10 years, the Volvo Group has worked intensively to share process innovation practices among its manufacturing sites. One goal is to raise all truck factories in the network to a defined "gold standard" by 2018. One initiative is a corporate process innovation program that collects best practices from factories in a global database accessible through the Volvo Group's intranet. Another initiative is a global online knowledge-sharing conference that brings together about 200 to 300 attendees from across the company's operations. Held about 10 times a year, the conference is scheduled in the morning according to the U.S. Eastern time zone so that the majority of factories located in the U.S., Europe, South Africa, and East Asia can participate. The conference slogan captures the idea behind intracompany open process innovation: "Everyone has something to teach; everyone has something to learn."

2. Focus on the pace of process innovation.

We find that many managers tend to overrate the quality of their company's process innovation. The truth is that not everybody can be above average. Even in the exceptional case where a factory's processes are indeed state of the art, hiding them can usually fend off competition for a limited time only. The only way to know how advanced your practices actually are is to compare them with someone else's practices.

[3] T. Netland and K. Ferdows, "What to Expect From a Corporate Lean Program," MIT Sloan Management Review 55, no. 3 (summer 2014): 83-89; and T.H. Netland and K. Ferdows, "The S-Curve Effect of Lean Implementation," Production and Operations Management 25, no. 6 (June 2016): 1106-1120; and G. Szulanski and R.J. Jensen, "Presumptive Adaptation and the Effectiveness of Knowledge Transfer," Strategic Management Journal 27, no.10 (October 2006): 937-957.

A more sustainable way to create competitive advantage in the manufacturing industry is not to keep your manufacturing excellence off the radar screen but to be faster than your competitors at process innovation. In Lyon, France, for instance, Renault Trucks, a subsidiary of the Volvo Group, has a state-of-the-art engine factory. In a central, highly visible part of the factory, quality rejects are put on display. Anybody who visits the factory — employees, customers, suppliers, sister plant managers, collaborating researchers, or others — can immediately see whether the factory has unresolved quality issues. Such exposure motivates factory managers and employees alike to speed up problem-solving and idea generation, as a way to keep the rejects out of sight. The "open" strategy increases the creativity, motivation, and, most importantly, the pace of process innovation at the plant. This gentle nudge provided by openness has helped Lyon become one of the Volvo Group's flagship factories for process innovation, motivating the factory to strive always to be the best possible version of itself.

3. Exploit connectivity technologies.

Our research found that data access systems help companies capture process innovations from the outside and spread them internally. Many business systems come with preinstalled "production know-how" that vendors have already integrated from their experiences across a multitude of customers. Although off-the-shelf solutions never guarantee that operations will improve, our findings show that increased use of data access systems leads to greater production cost reductions as employees adopt process innovations recommended by the software. Customer relationship management, supplier relationship management, supply chain management, and enterprise resource planning (ERP) software systems all require codification of tacit knowledge, which makes it easier to understand and transfer a process. This enhances a company's capacity to spread external process ideas and technology to the people who need it.

A medium-size Volvo Group remanufacturing factory for engines and transmission boxes in North Carolina offers an interesting case in point. Until a few years ago, the factory was digitally disconnected from the rest of the Volvo Group's dispersed remanufacturing factories. Remanufacturing operations tend to incorporate a lot of tacit know-how, and the factory had previously not seen any particular need for what managers described as "static software to plan its highly dynamic business." In spite of the managers' opposition, Volvo Group headquarters mandated that the factory implement the same ERP suite as other remanufacturing plants within the group. Since then, the new business software implementation forced the factory managers to think harder about their current practices and learn about new best practices from other units in the group.

Although such global ERP implementations can be difficult and expensive, they offer many benefits to users. A process innovation elsewhere in the factory network — which can be codified as an ERP parameter or a new planning procedure — can be shared across all the network's factories quickly.

4. Improve your organization's ability to absorb and implement ideas from external sources.

To make innovations matter for production cost reduction, factories must strengthen their ability to make learning from the outside stick — something scholars call an organization's absorptive capacity[4]. Absorptive capacity starts with a deep belief that there are important lessons to be learned from others. In addition, factory management must establish routines for gathering ideas from external sources and putting them to use. A good way to do this is to specify and codify the existing knowledge in a set of standards. While standards should never be taken as generally valid across all areas of a company, they make it easier for people to use past learning and help focus improvement efforts. The use of standards and regular standards revision meetings are practical ways to build absorptive capacity, particularly when those standards can be shared online with the entire plant and any sister factories.

A Volvo Group powertrain plant in the Kantō region of Japan offers an excellent example of what strong absorptive capacity can do for process innovation. For decades, the plant's managers benchmarked their operations against others in Japan and incorporated practices that they found better than their own. After many years of systematic internalization of external best practices, the factory found itself at the "performance frontier." Seeking new inspiration, the factory teamed up with Volvo Group headquarters to access the group's powertrain R&D departments in Sweden and external technology partners. Today, managers have tried to combine the best of Japanese kaizen culture with the latest engine assembly technology from abroad — and they're not done yet: The managers report that leveraging their proficiency in absorptive capacity helps them stay at the forefront of competition.

5. Open up to the outside.

It is not surprising that factories that lag in operational performance tend to improve when they participate in open process innovation. The benefits for the best-in-class factories are not so obvious, but they are real. Cutting-edge factories can attain deeper expertise by teaching others, but they often need to search outside their factory network for new inspiration. Our research indicates that the deeper a company searches for a source of external knowledge (for example, understanding a novel casting technology researched at a university), the greater the cost reduction it will experience, whether or not it is a leader in its industry.

In fact, under normal circumstances, the better you get, the more you can gain by opening up. In a Volvo Group truck assembly plant in Virginia, the management team decided to move their customer fairs from exotic locations to the factory site. This turned out to be wildly successful: During the fairs, old

[4] S.A. Zahra and G. George, "Absorptive Capacity: A Review, Reconceptualization, and Extension," Academy of Management Review 27, no. 2 (April 2002): 185-203.

and new customers would ask blue-collar operators questions directly on the line. The customers received passionate answers from skilled people who were not trying to sell anything and just wanted to convey their expertise. At the same time, operators learned firsthand what customers really wanted from Volvo trucks. Opening up to the outside paid off in terms of both higher sales and increased productivity.

6. Utilize unconventional sources of knowledge.

Art Fry, who co-invented the Post-it note at 3M Co., has proposed that creativity is "a numbers game"[5]: The more ideas you have, the more good ones you find. Innovation fairs, internal contests, conferences and exhibitions in other industries, and joint projects with research institutions and universities are all good sources of fresh ideas that enable managers to step back and think outside the box. Provocative ideas from nontraditional sources of knowledge may spark process innovation and help overcome difficult problems[6].

One good example is from a truck plant in Pennsylvania. Operators had identified a safety hazard when technicians worked on top of the cab to do final installations. Searching for ideas from outside the organization, they came up with a tailored bungee jump cord that safeguarded the technicians without limiting their mobility. The role of unconventional sources of ideas at the Volvo Group resonates with other iconic examples from the manufacturing industry. For example, Toyota's Taiichi Ohno took his inspiration from American supermarkets when designing and introducing justin- time parts delivery to Toyota's assembly lines after World War II[7]. Another example is the way that GlaxoSmithKline plc learned to minimize downtime from McLaren Honda, a British Formula 1 automotive racing team company that shared its expertise about pit stop operations[8].

How to Get Started

Open product innovation is already a well-known strategy. We think open process innovation is a logical extension. As product life cycles continue to decrease and demand for individualization increases, companies that master the combination of superior product and process development will be better positioned.

Ultimately — and ironically — the success of a program of operational openness will depend most of all on how well a company knows itself. Managers will need to ask: What part of our product innovation would benefit most from the search for external knowledge? What part of our process innovation could

[5] B. Hindo, "At 3M, a Struggle Between Efficiency and Creativity," BusinessWeek, June 11, 2007, www.bloomberg.com.
[6] E. v. Hippel and G. v. Krogh, "Identifying Viable 'Need–Solution Pairs': Problem Solving Without Problem Formulation," Organization Science 27, no. 1 (January-February 2016): 207-221.
[7] See "Taiichi Ohno," The Economist, www.economist.com, July 3, 2009; and T. Ohno, "Workplace Management" (Portland, Oregon: Productivity Press, 1988).
[8] See, for example, McLaren Technology Group, "Case Study: GSK," May 15, 2014, www.mclaren.com.

benefit most? Where should we combine the search for product and process knowledge? Given our strengths and weaknesses, from whom would it be most beneficial for us to learn? What can we offer them in terms of product and process know-how in return for what they can teach us?

As with many organizational changes, open innovation is best begun gradually. We do not recommend switching from closed to open process innovation in a day. However, that is not to say that companies should not start now. The bulk of our research persuades us that the businesses that win in the future will be those that master both the process and product sides of open innovation.
