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IS COLLABORATION THE **NEW INNOVATION?**

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Welcome to the digital deal economy, where a paradigm shift in traditional mergers and acquisitions (M&A) and joint ventures (JVs) is underway. Because digital disruption is taking place so fast, long-established partnership structures like mergers and JVs can be too slow, costly, and cumbersome for even the largest companies to take advantage of the new technologies that will help their businesses succeed. “Fast follower” has gone from the lowest-risk approach to innovation for a large incumbent business to the highest-risk approach—seemingly overnight. As a result, we’re seeing companies gravitating to a new approach to become first movers: something we are calling “industrial mash-ups.”

At EY, we’re often asked to help companies find effective paths to new opportunities and, increasingly, business transformations made necessary by disruptive digital technologies. This is more challenging today, because cloud computing, mobility, big data analytics, social media, blockchain technology, and the Internet of Things are becoming powerful new platforms for rapid business innovation. The size, scope, and speed of the new digital opportunity and change underway are breathtaking. Our recent Capital Confidence Barometer, a survey of senior executives from large companies around the world, found that 40 percent of respondents are planning to enter into alliances to help create value from underutilized assets—we believe many of these will be industrial mash-ups.

Industrial mash-ups borrow from the informality and flexibility of internet mash-ups—companies that emerge rapidly by making use of others’ internet services, often made publicly available through an application programming interface (API)—to gain the high-speed innovation that is now required for business survival. We’ve seen companies use this simple form of partnering to pursue new opportunities before they’ve figured out the precise percentages of business value that each partner will contribute. We’ve seen companies open their information, assets, and services, making them available to others to create new business value. We’ve seen companies establish digital marketplaces to provide a forum for sharing information about the nature and availability of many businesses’ assets and capabilities. And we’ve even joined in a mash-up with GE Digital that has many of the attributes just described.

To help you better understand the nature of industrial mash-ups and the opportunities they offer, we’ve worked with Harvard Business Review Analytic Services to provide the following report. While we are still in the early stages of industrial mash-ups’ emergence, we believe the most successful companies will increasingly be the ones that look at many different alternatives as they allocate capital, including industrial mash-ups as well as M&A, and more formal JVs and alliances. Not to do so would be to risk falling behind.

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IS COLLABORATION THE NEW INNOVATION?

Industrial mash-ups: A powerful way of driving growth is emerging

WE'RE AT THE DAWN of a golden age of business innovation. There has been a revolution in how companies create value—from business processes, marketing, and governance—and, especially, their approach to innovation. This has been sparked by technological advances such as the maturing of the cloud, smart mobile devices, big data analytics, and social networking, which have converged to form digital platforms—and a new digital deal economy—for rapid business innovation.

A first wave of disruptive tech-enabled businesses has emerged in the consumer space. Companies like Uber and Airbnb created “the sharing economy,” disrupting and transforming their industries almost overnight. As principles of the sharing economy extend to the enterprise, the emergence of the Internet of Things (IoT) is profoundly altering the corporate landscape. And this connection of industrial assets with digital networks is happening fast: Gartner predicts that in 2016, 5.5 million new things will be connected every day. By 2020, more than half of all business processes and systems will incorporate some element of IoT.

The business value of the opportunity is enormous—the GE Foundation cites research estimating the economic impact of IoT will range between \$2.7 trillion and \$6.2 trillion annually by 2025.¹ In order to take advantage of this opportunity—indeed, to avoid being left behind—companies must move fast. Of the many challenges companies are facing, none is more pressing than the pace of change.

Historically, incumbent market leaders have taken the fast-follower path to innovation. Given the speed at which some of these opportunities are emerging and the extent to which first movers are dominating, fast-follower has become high-risk.

The same can be said of traditional approaches to deal making. Typically, an incumbent leader hoping to jump-start innovation would acquire it. In today's business environment, the ever-shortening innovation cycle can make partnership structures like joint ventures and M&A too slow, costly, and cumbersome, even for the largest companies. Mergers and acquisitions require one company to have enough resources to buy another and entail rigorous, time-consuming negotiation and documentation. Joint ventures, although less complex, also require a high degree of rigor around revenue- and cost-sharing.

While M&A and JVs will always exist, in response to the current pressures, companies are gravitating toward a new form of alliance: industrial mash-ups.

¹ “Building the Right Trade Policies to Support the Internet of Things,” GE Foundation, November 25, 2014, © 2016 General Electric Company.

Collaboration is essential. These new ventures depend not only on sector-specific domain knowledge and customer relationships, but also on expertise in analytics, cloud services, wireless connectivity, software, and security.

ECOSYSTEMS OF COLLABORATING PARTNERS IN A DIGITAL MARKETPLACE

In an industrial mash-up, a company shares an asset or capability with one or more partners in a way that creates new possibilities for all—without infringing on the company’s ongoing use of the asset. Participants develop new products and services rapidly by piecing together components from an ecosystem of collaborating partners.

Such mash-ups may take many forms, but unlike mergers or JVs, mash-ups operate under simple collaboration agreements that may not specify financial terms. Aimed primarily at finding mutual benefits through effective sharing and utilization of resources, they don’t tie participants to synergy targets or require complex post-merger integration efforts. As Ben Gomes-Casseres, professor of international business at Brandeis University and author of *Remix Strategy*, explains, “These partnerships are open-ended, as the partners don’t know exactly how the ventures will pan out.” Such partnerships replace the physical vertical integration of an M&A or JV with collaborators who share the inherently large risk of an entirely new business venture.

Collaboration is essential. These new ventures depend not only on sector-specific domain knowledge and customer relationships, but also on expertise in analytics, cloud services, wireless connectivity, software, and security. Few organizations possess all of these capabilities.

Major industrial companies are recognizing they need to switch from a model based on sole control to one anchored in collaboration, and from partnerships of only two to partnerships with potentially many members. There is also no reason why companies cannot be a part of more than one mash-up simultaneously, spreading investment across multiple innovation opportunities. “Increasingly, a large industrial company cannot think about itself as simply a company,” says Gary Hamel, a faculty member of the London Business School and the director of the Management Innovation eXchange. He says, “It needs to think about itself as a node in a much broader network, and it needs to see ‘competition’ as not simply about how we build market share but about how we capture innovation share from across a very broad ecosystem.”

GE, for instance, decided in February to open its operating system for the IoT to other businesses and software developers. According to Greg Petroff, experience leader for GE Digital, “Five or 10 years ago we would have tried to build this by ourselves, but we’ve realized we can’t. To build this marketplace, we need partners who can fill in the blanks. The old GE would say, ‘Let’s go acquire that,’” he adds. “The new GE says, ‘Let’s find partners who are going to come along with us on the journey and help us get there faster.’”

One key to creating industrial mash-ups is the availability of easy-to-use, internet-based transactional environments. This digital marketplace provides a forum for matching assets with needs and for sharing information about the nature and availability of a company's assets and capabilities. Just as important, it also reduces the friction associated with more traditional alliances, speeding transactions and fostering greater flexibility, agility, and efficiency. Participants can build scale and capabilities quickly, getting to market faster than otherwise possible by integrating other organizations' application programming interface (API)-based specialized services into their own solutions.

YIELDING NEW VALUE FROM EXISTING ASSETS

The combining of technology and industrial assets will produce a true revolution in productivity in many industries. In the immediate term, mash-ups offer an intriguing way for asset-intensive industries to generate new revenue from existing capital assets that normally lie idle some of the time.

Like personal cars—which are used, on average, only 4 percent of the day²—many industrial assets are underutilized. A study of U.S. hospitals by GE Healthcare found that mobile medical devices such as ventilators, infusion pumps, and telemetry units typically make up more than 95 percent of a hospital's clinical asset inventory, yet have an average utilization rate of just 42 percent.³ Similarly, in the U.S., office space is used only 30 percent of the time,⁴ and 20 percent of all trucks ride empty,⁵ while those that aren't empty are, on average, only 75 percent full. Similar analyses yield like results for CT scanners, MRI machines, construction equipment, and more.

To be sure, not all industrial assets can be shared. But once information about a shareable asset (e.g., availability, condition, access) can be captured and communicated securely, the asset itself can be shared. Industrial mash-ups could boost utilization of assets significantly—by 50 percent, 100 percent, or more.

Some mash-ups involve companies sharing assets for their intended original use within their own industry. As John Herpy, a strategy lead in Boeing's Enterprise Services, Shared Services Group, says, "The amount of change that's taken place in the airline industry—it's like data whiplash—and the amount of data flowing through today's aircraft is information rich. Recent deployment of radio frequency identification capabilities and the ability to intelligently leverage data from these strategically positioned on-aircraft sensors provide myriad opportunities. Think of the Internet of Things extending out into the sky. We can track an aircraft's position and its in-flight performance. When it lands, we can use this data to have the right parts and maintenance capabilities in place to minimize aircraft turnaround time. The ability to track and predictively think about maintenance were at the core of the creation of Boeing's Fleet Material Solutions and Fleet Integrated Solutions businesses."

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John Herpy, Strategy Lead,
Enterprise Services, Shared Services
Group, Boeing

² "Spaced Out: Perspectives on Parking Policy," RAC Foundation, July 17, 2012, © 2012 The Royal Automobile Club Foundation for Motoring.

³ "Out of Control: Little-Used Clinical Assets Are Draining Healthcare Budgets," Healthcare Financial Management Association, July 2, 2012.

⁴ "What It Takes to Collaborate," Herman Miller Insight, 2014, © 2014 Herman Miller, Inc.

⁵ "Despite High Fuel Prices, Many Trucks Run Empty," The Christian Science Monitor Online, February 25, 2012, © The Christian Science Monitor.

Blockchain could become an enabling engine for the extensive partnering required to pursue certain kinds of new business opportunities.

Boeing's Fleet Solutions are mash-ups that integrate customers, parts suppliers, and component overhaul providers in a network designed to deliver a flexible suite of services supporting airline maintenance, repair, and overhaul services. Improved dispatch reliability, increased airplane availability, and reduced inventory costs are some of the benefits of the integrated network. Putting together Boeing's Fleet Material Solutions wasn't easy, according to John Herpy. "Back in the late '90s, I remember standing in front of a host of suppliers, each with its own business goals, processes, and systems, painting the vision of an integrated data-rich network where all members benefited. It was a tough sell. The same held true for our efforts to convince customers to become active, vested stakeholders. This included selling customers on the value of pooling their parts and component resources inside the network. In the end, it was as much about building trust-based relationships with customers and suppliers as it was about solving complex business and technical problems. We moved forward realizing that together we would succeed better than we ever could acting separately."

CREATING VALUE THROUGH NEW CAPABILITIES

Beyond increasing productivity by enabling asset sharing, industrial mash-ups can help companies build entirely new capabilities. Such ventures hinge on the use of APIs for accessing software applications and tools to build hybrid business models easily. B2B sharing platforms work by creating a user-friendly spot market for resources that were previously accessible only through ownership or via long leases. Blockchain, which came into the world as the technology that underpins the bitcoin digital currency, could become an enabling engine for the extensive partnering required to pursue certain kinds of new business opportunities. A shared transaction processing and ledger system, blockchain offers a secure way of collaborating among multiple parties who don't know each other.

Case in point: Self-driving systems

According to the *Wall Street Journal*, two major auto parts manufacturers (Delphi and Mobileye) are joining forces in what they call a "tie up," investing several hundred million dollars in a partnership to produce autonomous-driving products for carmakers. They are sharing technology and execution risk in hopes of creating a major role for themselves in the driverless car market. Ultimately, they expect their systems to enable cars to navigate such complex driving challenges as merging onto highways and making left turns across multiple traffic lanes.

Case in point: Lights, cameras ... and apps!

GE has installed for Chase Bank 1.4 million LED lights equipped with sensors and connected to GE's Predix platform. Once "mashed up" with appropriate software solutions, the data generated by the lights can enable businesses and municipalities to develop a wide range of services. The potential applications could include everything from weather and traffic alerts to an event app

that allows sports enthusiasts to instantly identify available parking options, receive alerts on public transportation options based on traffic patterns, and suggest food and drink vendors located near their seats at a venue. To accelerate the commercial development of these applications, GE has invited partners to develop apps for the LED lights.⁶

Case in point: Mining data to get well faster

In the health care industry, an enterprise technology company, a consumer electronics company, and a medical device company have collaborated to create more effective and efficient patient care management for postsurgical patients. Through APIs, the partners are using the technology company's big data analytics platform, combined with the medical company's clinical know-how, to predict patient outcomes, suggest treatment plans, and give patients personalized advice to help speed and improve recovery. The consumer electronics company is designing user interfaces for a mobile app so that simple patient interactions will deliver the right information quickly and clearly for each individual user. No one or two of these companies could have brought this idea to market without the assets and unique expertise of the others.

WHEN IS A MASH-UP THE BEST OPTION—AND WHAT MAKES IT WORK?

Mash-ups create potentially unique business value by bringing together very different companies well-known for their individual areas of expertise. According to Gomes-Casseres, "One of the forces that drives companies to use such arrangements is a new, fast-changing environment—like that seen in the IoT, in mobile phone technology, and in automobile electronics, among others. In such an environment, companies need to keep their choices fluid and their bets loose. They don't put all their eggs in one big merger; they use smaller, multiple alliances."

As Gomes-Casseres explains, these ecosystems start with a leader, or several leaders, who structure the terms of the partnership to some extent and continue to shape it. They create a scaffolding—an open-ended deal based on an idea of how they can work together. They can then offer that scaffolding to more participants, creating a crowdsourced environment for innovation.

Boeing is one of the largest users of radio frequency in the world. According to John Herpy, "Leveraging radio frequency for on- and off-aircraft communication requires a host of players to act in harmony to achieve success. It starts with innovative engineering and relies heavily upon global and regional radio frequency regulatory collaboration to enable engineering ideas to become real-life solutions. Radio frequency is an asset where an international Radio Regulation Treaty determines how the asset is shared and used throughout the globe. An innovative engineering idea without the coordination to employ radio frequency globally will not go very far. Boeing plays an active role in influencing the periodic revisions of the treaty which involves and impacts more than 200 countries and territories throughout the world." A company like Boeing relies upon this global mash-up to drive changes necessary to bring

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⁶ "World's Largest LED Retrofit Will Cut Chase Bank's Lighting Bill in Half," GE Reports, February 18, 2016, © 2016 General Electric Company.

It's essential for partners to have a platform that invites people to collaborate, interact, and learn from each other.

innovation to the marketplace. Again, in the end, it is about building trust-based relationships with the radio frequency regulators around the globe to build consensus and collaborate on solutions that meet the interests of the stakeholders.

Hamel suggests that in order to win in the long term, companies have to build trust capital across the ecosystem. He suggests starting with a set of principles: Err on the side of generosity, and err on the side of transparency. "You have to be willing to be more transparent about your own internal resources and capabilities so other people understand what you have and how they might leverage those capabilities," he says. In terms of generosity, he adds, companies must create simple ways of getting started, where initial discussions are not overburdened with all the complexity of property rights and gainsharing. It's essential for partners to have a platform that invites people to collaborate, interact, and learn from each other and discuss opportunities for value creation, before they jump into the question of how to split the pie.

Ultimately, the advantage of mash-ups lies in the size of the opportunities they produce; the partners involved are effectively creating a bigger pie.

In general, mash-ups offer a better option when:

- The value propositions are exciting enough that each entity wishes to partner but prefers that the risk be lower than it would be under a formal merger.
- The scale of each company defies vertical integration via M&A—none of the potential partners could afford to buy and integrate the other.
- The opportunity motivates partners to share product development risk and go-to-market strategy informally, before they know precisely how they might share business value, which would be necessary to establish a JV.

Of course, the fundamentals of good partnering also apply to mash-ups:

- Close monitoring of the collaboration is key, both internally, to ensure the business relationship is evolving as expected and cultures are meshing, and externally, to ensure that the offering is delivering on its promise to customers.
- Partners must establish clear, shared project goals and objectives early and reinforce them often. But flexibility is critical: It's better to fail fast and try something else than to stick with a struggling project. Adds Hamel, "Companies should also have a shared view of the underlying challenges they face and how easily they are going to be overcome."
- Eventually, a mash-up is doomed if the partners can't agree on the relative business value of their contributions, or if one or more partners fail to obtain a sufficient return.
- Similarly, the mash-up will fail if new technology emerges that makes one or more of the partners obsolete.

WILL INDUSTRIAL MASH-UPS CHALLENGE THE VERTICALLY INTEGRATED ENTERPRISE?

Industrial mash-ups will continue to evolve rapidly for the foreseeable future because they are a good match for the pace of modern innovation. But the concept could go further: It may answer the challenge faced by top-down planning and central organization, which also struggle to keep pace with innovation. The startlingly fast rise of sharing economy businesses with distributed models of development shows that modern “digital” organizations can build higher value and more consistent experiences much faster than traditional businesses can by avoiding the drag imposed by central planning, control, and complex infrastructure.

Over time, API-driven, self-organizing, self-optimizing marketplaces enabled by industrial mash-ups could challenge the traditional end-to-end, vertically integrated enterprise. As John Herpy of Boeing notes, “Over the past 50 years strategy, and in many cases innovation, came from the top. At Boeing we have shifted and flattened our approach. We have crowdsourcing ecosystems that enable this approach. One of these ecosystems is called inSite. It provides an environment for peer-to-peer collaboration for anyone in the company. Another is called Dreamstarter—our version of Kickstarter. Innovative ideas flow in and the wisdom of the crowd is applied. If an idea passes muster, it may one day be a key component of a future Boeing product or service. This from-the-ground-up approach spurs and rewards innovation in ways that could never happen in the old top-down model.”

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CONCLUSION

The enormous transformative power of technology-enabled collaborative partnerships cuts both ways—creating big winners and also big losers. The digital future—forged by cloud services, smart mobility, social media, and big data analytic power—will demand and reward agility and focus. For established businesses, getting an early advantage in commercializing the Internet of Things is not only a chance to tap into new markets but also insurance against the threat of future disruption. As Gomes-Casseres notes, “In a rapidly changing environment like that created by IoT, there’s a lot of uncertainty, and where there’s uncertainty, companies need an option on the future. These partnerships create those options.”

In some cases the best way to tap into the potential afforded by this digital future will be traditional M&A and JVs. But as the new business landscape challenges companies to move fast or risk falling behind, this new and innovative way to do business could prove a key driver of success. Collaborative rather than monolithic and less structured than M&A or joint venture agreements, industrial mash-ups require a more flexible approach to asset ownership. For companies that embrace the challenge of collaboration, mash-ups offer a 21st-century approach to deal making—a fast track to innovation and growth.

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