The Digital Manufacturer in Asia
Resolving the Service Dilemma

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Introduction

“Factory Asia” has long dazzled the world with its successes. In recent months, however, the outlook for manufacturers in Asia Pacific has clouded, impacted by rising wages, currency devaluations, and market volatility:

- China, a key driver of the world’s economy, is expected to see its growth fall to 6.8 percent this year, which is not only the lowest level in more than two decades but is also forecast to decline to 6.5% in 2016 and below 6% by 2018.\(^1\) The rate of growth for its manufacturing sector has fallen to a six-year low in 2015.\(^2\)
- South Korea has experienced its biggest drop in exports since 2009.\(^3\)
- Japanese industrial output has been impacted by the turmoil in China, its biggest trading partner.\(^4\)
- Despite attention given to Prime Minister Narendra Modi’s “Make in India” policy, manufacturing growth in India has waned.\(^5\)

In a recent Cisco survey of executives from both industrial machine builders and end-user manufacturers (see “About This Study” on next page), 79 percent of respondents believe that digital disruption will drive a moderate to major impact at their companies in the next three years (see Figure 1). That figure rises to 90 percent among Asia-Pacific nations (for this survey, China, South Korea, Japan, and India). In such a climate of uncertainty, competition becomes ever more fierce and manufacturers must seize every opportunity and competitive advantage they can find.

China has answered this challenge with a government action plan, “Made in China 2025,” in which they will aim for a big leap in innovation as well as manufacturing efficiency. Its overall goal is to fully compete with developed manufacturing powers by 2035, and lead the world’s manufacturing by the 100th birthday (2049) of the New China.\(^6\)

A critical element of China’s quest for increased innovation will be in the form of new business models,

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Figure 1

In the Asia-Pacific region, most industrial machine builders and end-user manufacturers anticipate at least some impact from digital disruption

<table>
<thead>
<tr>
<th>Impact Level</th>
<th>Asia Pacific</th>
<th>Rest of World</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>1%</td>
<td>3%</td>
</tr>
<tr>
<td>Minor</td>
<td>9%</td>
<td>21%</td>
</tr>
<tr>
<td>Moderate</td>
<td>52%</td>
<td>43%</td>
</tr>
<tr>
<td>Major</td>
<td>37%</td>
<td>32%</td>
</tr>
<tr>
<td>Catastrophic</td>
<td>1%</td>
<td>1%</td>
</tr>
</tbody>
</table>

625 respondents

Source: Cisco, 2015
particularlly around services and value-added offerings. Machine builders in Asia and around the world have long felt the lure of the service-oriented revenue model as a driver of growth and new revenue—one that significantly benefits their end-user manufacturer customers.

In effect, simply making a good product may no longer be enough. Increasingly, what happens after the product is sold looms ever larger. Machine builders that successfully leverage services are using them to drive disruptive new business models that, in effect, enable them to charge for business outcomes—such as plant uptime—just as they now charge for physical products sold as a capital investment. Companies that don’t harness services for such recurring revenue will risk falling behind in a rapidly changing marketplace in which innovation and agility rule.

Despite a clear impetus to act, however, only a select few manufacturers have successfully transitioned to service models in what we refer to as the “service dilemma.” This gap between the desire for services and its limited success has existed for decades. Machine builders and end users agree strongly on their intention to move into services. However, they acknowledge that in the near term, services will not grow faster than products—a major inhibitor that is slowing the transition to services.

Technology advances often bolster business models that drive innovation, efficiency, sustainability, and cost savings. For example, FANUC has automated production lines that run for weeks unsupervised; this has enabled it to drive new levels of efficiency while generating great amounts of data about the usage and health of those machines. Foxconn, meanwhile, is adding 10,000 of its own industrial robots a year to its plants in China, aiming for 30 percent automation by 2020.

Such advances in automation are causing many firms to rethink their overall strategy. In particular, the importance of connected products and connected machines in manufacturers’ service-oriented strategies—along with the mounting complexity that they bring—is creating new opportunities and challenges.

In effect, the services journey has now converged with the digital business journey. By accelerating their digital business transformation, manufacturers will be able to better navigate complexities of moving to the services-oriented revenue model with greater ease and speed, less cost, and more effectiveness.

About This Study

To help close the services value gap, Cisco initiated a comprehensive research study of industrial machine builders and end-user manufacturers. The survey includes opinions from more than 600 senior decision-makers across 13 countries, with 141 coming from Japan, China, South Korea, and India. We also conducted qualitative interviews with key industry thought leaders, along with in-depth secondary research and economic analysis.
Digitization Lays the Foundation for Service-Oriented Revenue Models

Cisco defines digital business transformation as organizational change through new business models and the use of digital technologies to improve performance. It enables greater, more contextualized insights and increased speed and agility, among other advantages.

While many machine builders and end-user manufacturers have a digital agenda, a considerable roadblock is cost, especially amidst decreasing growth and flat-to-down budgets. However, the pace of business is accelerating exponentially. Manufacturers will need to take advantage of self-funding opportunities. With the pace of business accelerating every day, manufacturers must create a sustained competitive advantage by managing their own disruption and transformation. This requires that they fundamentally change how they operate, with a greater degree of speed. The good news is that manufacturers will capture significant value as they further digitize.

In a report by the Global Center for Digital Business Transformation, an IMD and Cisco initiative (“Digital Vortex: How Digital Disruption Is Redefining Industries”), nearly four of every 10 manufacturing incumbents were considered vulnerable to digital disruption in the next three years. However, 35 percent of manufacturing respondents did not feel that digital disruption was a C-suite concern. Given the threat of disruption, this lack of concern is clearly a mistake.

Cisco’s latest Digital Value at Stake analysis confirms the opportunities. (Cisco defines Value at Stake as the potential bottom-line value that can be created, or that will migrate among companies and industries, based on the ability to harness digital capabilities over the next decade.) We project $383 billion in Digital Value at Stake will be driven by connected products, connected machines, and new services models. The payoff for an average $20 billion manufacturing firm is a 12.8 percent profit upside over the next three years, and 19 percent over 10 years.

While manufacturers have made significant inroads toward digital transformation, it is increasingly clear that the digital opportunity is accelerating dramatically faster than their current capacity to change.

The Digital Age Demands Transformation in Technology and Business Models

The promise of services exhibits a powerful pull on manufacturers that want to remain competitive in the digital age. Rather than simply selling an industrial machine for a one-time fee, for example, machine builders can offer
a product that—once connected within the plant or, ultimately, across an ecosystem—can be offered as a service in a recurring revenue model. In addition, by virtue of being connected, the machine’s performance and utilization data can enable new value-added offerings, including predictive maintenance, quality control, plant-floor efficiency, and customer engagement.

Our survey confirmed that the transition to a services-oriented revenue model is top-of-mind for Asian manufacturers. Globally, Asia is the frontrunner in perceiving the need to transition to services. More than half of manufacturers interviewed in the Asia-Pacific region agree to a large or very large degree that their companies plan to grow by transitioning to services (62 percent), compared to 48 percent in the Americas and only 32 percent in Europe (see Figure 2).

**The Asian Advantage**

Many manufactures struggle with the transition to services due to the immediate prospects of services revenue being smaller than those of traditional product offerings. End-user manufacturers want the flexibility to leverage both CapEx and OpEx. In order to achieve this, they need to diversify.

Asia is ahead of the rest of the world. Globally, just 29 percent of respondents indicated services would grow faster than products (see Figure 3). This is despite services growing, in the vast majority of instances, from a much lower base. On the other hand, in Asia, 40 percent of respondents

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**Figure 2**

Industrial machine builders and end-user manufacturers are basing their strategies on services

<table>
<thead>
<tr>
<th></th>
<th>Asia Pacific</th>
<th>RoW</th>
</tr>
</thead>
<tbody>
<tr>
<td>To a small or very small degree</td>
<td>6%</td>
<td>15%</td>
</tr>
<tr>
<td>To a moderate degree</td>
<td>30%</td>
<td>44%</td>
</tr>
<tr>
<td>To a large or very large degree</td>
<td>92%</td>
<td>4%</td>
</tr>
</tbody>
</table>

141 respondents, all from Asia Pacific. 484 respondents from rest of world (RoW)

Source: Cisco, 2015

**Figure 3**

Expectations for services growth is higher in Asia Pacific than rest of world

<table>
<thead>
<tr>
<th></th>
<th>Asia Pacific</th>
<th>Rest of World</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product revenue will grow faster</td>
<td>42%</td>
<td>49%</td>
</tr>
<tr>
<td>Both will grow at same rate</td>
<td>18%</td>
<td>25%</td>
</tr>
<tr>
<td>Services revenue will grow faster</td>
<td>40%</td>
<td>26%</td>
</tr>
</tbody>
</table>

Source: Cisco, 2015
believe services will grow faster than products—a notably higher percentage than that expressed by their counterparts in the Americas (28 percent) and Europe (20 percent).

However, as Figure 4 reveals, the top goal of Asia-Pacific manufacturers in pursuing a service-oriented revenue model is focused on enhancing current businesses by deepening relationships with existing customers, rather than pursuing new growth opportunities.

While Asia may have the upper hand in terms of generating revenue from services, it is not thinking big enough. The opportunity to generate significant new growth is possible, with the agility and insights that come with becoming a digital business.

**Digital Capabilities Are Core to Success**

Overall, the move from products to services is driving what could be called a “two-front war” in manufacturing—in effect, trying to maintain existing quality standards while at the same time moving into unexplored realms.

At the core of these challenges is the fact that manufacturers are not themselves “technology companies”; yet, services increasingly demand they must be. As General Electric CEO Jeffrey Immelt has stated, “All companies need to become Internet and software companies. The industrial world is changing dramatically, and those companies that make the best use of data will be the most successful.”

However, the challenge in doing so is clear to our Asia-Pacific survey respondents. In their eyes, the No. 1 downside of services is complexity in product/service lifecycle management (44 percent), followed by confusion and inefficiency arising from the coexistence of product and service businesses (38 percent), and by greater dependency on third parties (30 percent).
Digital operating models provide more options when moving to an as-a-service model. These models require a collective footprint (analytics, compute at the edge, infrastructure/software/cloud) that allows organizations to evolve their businesses as they desire.

When we asked Asia-Pacific end users and machine builders which technologies will have the greatest impact on production over the next three years, they cited digital capabilities such as analytics (43 percent), machine-to-machine (M2M) communications (43 percent), and cloud (37 percent) (see Figure 5). As with our global totals, this is notable in part because of what respondents did not emphasize: “manufacturing” technologies such as robotics, 3D printing, and so forth. This underscores the pivotal role of digitization in manufacturing’s evolution, especially as connecting across an entire ecosystem—not just the plant floor—becomes increasingly critical.

**Featured Use Case: Connected Machines**

To further explore the impacts of digitization on capturing service value, we focused on one key manufacturing use case: connected machines on the plant floor. We surveyed both the providers of these connected-machine services and end-user manufacturers, the companies that utilize them in their plants. Connected machines can come in several different forms—monitoring devices in-house, monitoring devices by a third-party, or a new concept: “machine-as-a-service” (MaaS), in which the end-user manufacturer (that is, the customer) pays for a business outcome (for example, better uptime, improved production efficiency) as an operating expense, rather than buying a physical machine as a capital investment.

Connected machines on the plant floor are especially relevant here because they provide us with a “dual window”: first, they illustrate how a manufacturing segment (i.e., machine builders) can convert their core offering to services; second, they underscore the fact that end-user manufacturers must transform on a fundamental level to capitalize on their benefits.
In our survey, we found that the “connected plant-floor machines” use case is a highly mature opportunity for Asia-Pacific machine builders, with 33 percent already receiving telemetry from customers’ plant environments, and another 58 percent planning to do so. Just 6 percent of machine builders have no such plans. Of those machine builders already receiving telemetry from their customers’ plant-floor machines, 58 percent strongly agree with the following statement: “Our company gets a lot of value from the data we receive from the machines we sell to customers” (another 33 percent somewhat agree). These percentages were similar to the global totals.

Also consistent with the rest of the world, Asian end-user manufacturers view the machine-as-a-service model (MaaS) for connected plant-floor equipment in a highly positive light. Interest in Asia was higher (89 percent “fairly” or “very” interested) than in the Americas (85 percent) and Europe (76 percent). The primary benefits of MaaS for Asian manufacturers are quality improvement (41 percent) and operational efficiencies (40 percent).

Predictive maintenance is a critical application enabled by connected machines and data analytics. It enables workforces to maintain the machines that need their attention most, anticipating breakdowns before they cause downtime. In an industry in which original equipment effectiveness (OEE) metrics typically hover around 60 percent, such improvements promise true competitive differentiation.

Among end-user manufacturers that have access to predictive maintenance via connected machines, responses regarding its impact on original equipment effectiveness were overwhelmingly favorable, highlighting the key importance of digital technologies in maintaining uptime. In our survey, respondents highlighted the critical importance of predictive maintenance, with 95 percent of Asia-Pacific respondents calling it either a “somewhat” or “very” positive capability (compared to 87 percent globally).

**Key Capabilities of the Digital Manufacturer**

Clearly, Asian manufacturers are interested in use cases such as connected machines, but they also struggle with the operational complexities they must navigate to capture value from services. To alleviate complexities such as the “two-front war,” organizational silos, and a broader ecosystem of partners and third-party vendors, manufacturers must build a solid technology and business-process foundation. As long as the foundation is solid, they will have the flexibility to re-engineer their business based on digital capabilities and business models.
For many manufacturing leaders, budgets are flat and additional technology investments can appear daunting. Digital transformation, however, requires a “save to invest” strategy. Increases in plant uptime, business agility, and customer engagement will offset initial costs. For example, Cisco research on enabling digital architectures found that such investments would drive 20 percent savings on IT costs, which could be deployed elsewhere in the business. As we have seen in this study, an average, digital manufacturer can drive a 19 percent profit gain projected over 10 years. The real cost lies in not transforming.

Digital business transformation will enable manufacturers to:

1. **Build a Hyperaware Organization:** To implement competitive new business models, manufacturers will need agile IT architectures, hyperaware analytics, and overall business agility. That is, if they are to respond to customers and end users in real time, while ensuring quality and uptime with unprecedented standards of excellence. Security must be built-in at every step, across the entire network, not simply added piecemeal on an app-by-app basis.

2. **Make Informed Decisions:** Manufacturers need to treat analytics as a core capability. All of that data generated by new connections will need to be transformed into insight. Manufacturers need to move from making machines to generating value by gaining insights from data. In the digital age, no one goes it alone. Data insights will need to be shared securely across an expanding ecosystem of partners, customers, and third-party vendors. Manufacturers will need a new model to orchestrate that dynamic ecosystem and derive insights from data mined from far-flung sources. This will require foundational business and IT capabilities. In short, if manufacturers don’t first transform, they will fall far short in their efforts to become innovative, agile ecosystem players.

3. **Execute Fast:** The process of changing business models is a highly complex endeavor that cannot be achieved by facing these challenges on a piecemeal basis. Industrial machine builder and end-user manufacturer leaders will need to shift perspective from building an organization known only for reliability to that of an organization—underpinned by data analytics—that is known for its speed and agility. Each firm will need the business process and technology foundation to drive business agility; this will in turn enable innovation and business-model change while breaking down silos between IT/OT and engineering/services. Organization-wide digital business transformation—powered by the right technology foundation—will enable the speed and business agility that allow firms to meet these challenges and outpace their competition.

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**Asset Utilization (example use case)**

**Trident Group**

As India’s largest exporter of terry towels, Trident Group is using digitization to harness connectivity on its factory floors and maintain efficient and secure operations. On the plant floors, every tool, machine, and employee is connected with Wi-Fi communication and collaboration tools. Data collected on machines and employees is analyzed to inform maintenance schedules and help predict problems.

[learn more]
A Digital Revolution in Asian Manufacturing

Without looking at the service transition through the lens of digital business transformation, the efforts of manufacturers in this area will continue to falter. Technology change is critical, but it must be undertaken in concert with organizational change. That demands consistent policy and company culture, driven by top-down leadership from the C-suite and the board of directors.24

As we have seen, Asian manufacturers face an increasingly volatile market climate. As our survey results reveal, they understand the threat of digital disruption, along with the need for innovation and business model evolution. In such a climate, “staying the course” is not a viable option. Only digital transformation will keep “Factory Asia” a manufacturing powerhouse in the digital age.

Organizations that transform will experience a new era of innovation, with concrete gains in uptime, safety, energy savings, and customer engagement. By driving organization-wide digital business transformation, the winners will leave the service dilemma—and their competitors—behind.

1. “How China’s Downturn Is Affecting Southeast Asia,” Deutsche Welle, August 2015
4. “Japan’s Industrial Production Unexpectedly Declines in July,” Bloomberg Business, August 2015
5. “Manufacturing PMI Hits 7-Month Low on Poor Demand,” The Economic Times, October 2015
7. Ibid.
15. Cisco defines “Value at Stake” as the potential bottom-line value (higher revenues and lower costs) that can be created or will migrate among companies and industries based on their ability to harness digital technologies.
17. Our survey respondents included 81 percent end-user manufacturers and 19 percent original equipment manufacturers.
18. For this survey, EMEAR is defined as Italy, France, Germany, United Kingdom. Americas is United States, Brazil, Canada, Mexico.
23. “A New Go-To-Market Model for the Industrial Internet,” Industry Week, October 2015