



GE facilitates business outcomes by inviting management and operations to think with one mind

John Spooner, Director, Internet of Things (IoT) and Devices Practice
(john.spooner@tbri.com)

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GE's Minds and Machines event was the coming out party for GE Digital, a new arm focused on delivering business outcomes on top of industrial-Internet-enabled GE and non-GE equipment and software and services

TBR position

The industrialization of the Internet has one of the world's oldest companies looking, acting and collaborating like a startup. GE Digital, unveiled two weeks ago, is General Electric's new agent for applying the company's Industrial Internet know-how and assets, including its Predix platform and services, to driving business value. Long the supplier of industrial equipment, GE has charged GE Digital with helping lead customers in applying the industrial Internet — commonly termed the Internet of Things — to their businesses. GE Digital will be responsible for thoroughly integrating Internet connectivity, and particularly, the ability to leverage that connectivity to share operational data, which is then analyzed and brought into business decision making, management and day-to-day operations. The digital arm of GE follows through on a commitment by its parent company to build a broad ecosystem composed of its industrial equipment, software and analytics, as well as services — and those of a number of close partners both vertically and horizontally focused — to enable customers to wield data as a decision-making tool for creating business value. GE Digital will do more than connect operational technology, the factory floor, with information technology, the ERP system. It's providing an underlying capability to drive value from the connection. GE is putting itself forth as the first example. GE's Predix platform, developed in-house and released into beta this week, is at the heart of GE's ability to drive toward outcomes. Predix is the chief actor in connecting IoT things, such as factory floor equipment, to a range of capabilities, embodied in Predix apps for managing and analyzing key data.

Managing to the outcomes

The outputs from these apps become the eyes and ears for managers when it comes to leveraging insights from the factory floor or the power plant into business decisions, planning and implementation. The basis for each capability is the ability to create, capture, store and analyze the reams of data collected from the sensors resident in GE and non-GE, such as partners, industrial equipment, spanning a broad range of verticals. The improvements promised by delivering greater insight lead to increased revenue from increased efficiency, primarily reducing unplanned downtime, as well as pursuing new business opportunities. GE Digital's approach is to sell the outcomes; be open in supporting broad development on Predix, both for GE and non-GE technology; and lay the path to turn data into business insights.

GE Digital's broad capabilities will put it into the crosshairs of traditional IT providers, including Microsoft, IBM, SAP and Oracle, which bring their own deep levels of understanding of business data and the creation of business outcomes, utilizing IoT capabilities. GE may not attempt to push out these established IT vendors in the near term. Instead, it will interface, integrate and partner with those companies, around Predix.

TBR believes that, although not direct competitors, GE's approach most closely mirrors that of IBM, which itself has been deeply engaged in providing operational technology capabilities such as Smart Grid and integrating them with IT. Microsoft, IBM, SAP and Oracle each have a similar capability of providing the ability to capture, analyze and create business outcomes from data capture with their respective platforms. TBR believes Predix, Microsoft's Azure and IBM's Bluemix represent three broad-based service delivery platforms, which will enable developers to create applications that significantly move the needle by streamlining the time investment and difficulty of analyzing huge data sets, creating business insights and incorporating them into operations.

New themes for business

Where IBM and GE are both market makers when it comes to the Internet of Things, GE will bring new concepts to the market, which TBR expects to be taken up quickly by developers and customers.

Digital Threads: Optimization from order through delivery to view manufacturing not just as producing a product, but stewarding a process from raw materials, through production, to delivery and after-sale service; GE will popularize the processes of production staffing, in house versus outsourced production, machine operating time and other variables to accurately forecast and optimize means for meeting demand.

Digital Twin: The idea of having virtual models of each of your main products and/or testbeds for new products; for end customers, this is essentially modeling their business assets and/or products and using this to trace problems and increase efficiency. This is one way to leverage IoT data for business benefit. It gets at the question of why something is not performing versus expectations, what more could we do and how to capture opportunity.

GE Digital is, in many respects, becoming the IT of OT, extending the insight and control that IT brings to things like finance, human resources and supply chain to the production line, while propagating the very IT-like idea proactively driving business opportunity, efficiency and productivity savings, all at the same time. GE Digital starts with deep vertical experience. Yet, selling on outcomes-based solutions, even for industrial applications, quickly bleeds over into business applications. Ultimately, IoT will force a convergence of operational technology and IT, creating a unified practice. GE, IBM and Microsoft will be among the leaders in this transition, which will also



create opportunities for business-focused providers SAP and Oracle. Savings will be reinvested, in part, to drive further innovation and create new business models.

Driving the convergence of IT and OT

Concepts, such as digital threads, require tight integration of OT, GE's world, and IT, the world of competitors such as IBM and SAP. TBR expects large enterprise CIOs will force GE and competitors to focus on business integration of data-based decision making, bringing together IT, OT and IoT implementations and forcing collaboration, or competition, between GE, IBM, SAP and other vendors, regardless of the vertical-specific needs of engagements.

The reason: Companies will spend to save money. But they will invest to improve their business. It means many companies will make large capital investments, merging IT and OT. The concept of intelligent manufacturing, which GE calls Brilliant Manufacturing, will broadly take hold. The rising tide will improve the business prospects of all major vendors. On the business side, it's the equivalent of a utility putting itself in the position to quickly balance its electrical power output to take advantage of spikes in demand or increased pricing in the market. The upside to greater insight and greater control is increased efficiency and higher revenue potential for providers, according to GE.

What it takes to get there, and what GE can provide, is visibility into optimization across an entire grid, from adjusting the pitch on the blades of wind turbines to more effectively catch a breeze to upping the efficiency of a natural gas turbine or creating proactive management plans to reduce equipment downtime.

GE realizes that customers come at the concept of IoT/Industrial internet from many different perspectives. Many of them embrace new technologies, yet many do so while maintaining decades old investments. The company takes a patient, three-step approach to deployment:

Step 1: Get connected

Step 2: Gain insights

Step 3: Optimize

Where companies would seek to optimize, immediately, GE recommends ensuring full connection, first, assessing the insights needed and those gained, before setting a plan to optimize. The digital threads concept requires all three, including the right infrastructure to provide deep insights into how a company may set up its manufacturing lines, staff them, source materials, sell and service its customers. The barrier to insight is in ensuring the right inputs in the "get connected" phase, before using those to gain insights. GE Digital has nothing to do with Internet-enabled toothbrushes or teddy bears, as one GE executive quipped. Instead, the company represents GE's understanding that sometime it takes getting one's hands dirty in the plant, with the aim of improving efficiency and driving greater business results. What GE Digital and Predix offer, however, is the ability to be more targeted about getting one's hands dirty.

Acting like a startup, thinking like an established player

It's been a four-year journey for GE, which has placed its bets in the industrial Internet as an engine for growth, across its numerous businesses for oil and gas, utilities, transportation and others. GE Digital harmonizes and horizontalizes the company's deep vertical understanding, creating a service delivery platform with Predix, as the



concepts and broad application of IoT/Industrial Internet to drive business model change apply across numerous customers, industries and business types.

To enable the customer, GE Digital will approach as a partner, providing a range of industrial internet capabilities, services and consulting, all based on GE's Predix OS/platform for Internet of Things or Industrial Internet. The opportunity GE, the parent company, is pursuing remains in the massive industrial systems, where GE has extensive domain expertise and extensive business. The industrial internet will likely drive new investment in GE infrastructure. Yet, the decoupling of the two allows GE Digital to move faster and expand beyond traditional markets, making GE Digital is the world's largest, most experienced and, possibly, well-funded business-process-improvement-oriented startup. Like any startup, it has initial target customers — those from GE — and long-term plans for market domination.

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