GE Expands Predix Platform to Advance Industrial Internet Opportunities for Customers
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Predix adoption demonstrated through deals with BP, Exelon, NEC Corporation, Port of Los Angeles, Teledyne Controls, UCSF

- GE releases new suite of Predix applications and services; introduces the Predix System

- Acquisition of Bit Stew Systems enables efficient data ingestion for industrial applications

- Acquisition of Wise.io strengthens machine learning and data science capabilities for Predix and enables enhanced Digital Twin development

- Meridium acquisition places GE in the lead for Asset Performance Management app development; acquisition of ServiceMax positions GE to lead in service transformation

- Ecosystem expands with independent software vendor program to speed industrial application development; more than 19,000 developers now building on Predix

- Digital orders on track to exceed $7B, a growth of 25%+ in 2016

- Digital thread productivity exceeds $600 million and accelerating into 2017

Today at Minds + Machines, GE (NYSE:GE) announced new products, acquisitions and partner programs to enable further adoption of Predix, the operating system for the Industrial Internet. The platform enhancements, acquisitions and new ISV partner program further complement the Predix technology stack and make it easier for industrial companies to execute a strategic digital transformation to drive internal productivity. In 2016, orders from GE's portfolio of software solutions are on track to climb 25%+ to more than $7 billion – making GE the fastest growing digital industrial company in the world. Demonstrating the strength of Predix within GE, digital thread productivity will exceed $600 million, accelerating into 2017.

"The opportunity for industry is now," said Bill Ruh, Chief Digital Officer of GE and CEO, GE Digital. "The Industrial Internet is profoundly transforming how we operate and our ability to deliver greater productivity for GE and for our customers. Connected machines, coupled with deep machine learning, are more powerful than anything we have seen. These strategic investments in both the Predix platform and our partners continue to attract industrial companies and provide them with tools they need to embark on their own digital industrial transformations."

EXTENDING PREDIX FROM THE EDGE TO THE CLOUD

More than 19,000 developers are building on Predix today, after GE opened the platform to global customers earlier this year. GE expects 20,000 developers working on the platform by year-end. To service this growing segment of the ecosystem, as well as the hundreds of industrial businesses already using Predix, GE unveiled a new suite of software and applications designed to get Predix in the hands of operators, business analysts and other users in non-technical roles.

This new release will focus on expanding the platform and scaling development of Digital Twins – virtual representations of the billions of physical assets that comprise the world's industrial infrastructure – through Predix apps and toolkits. It also aims to grow the developer community by building better tools for software engineers within GE's industrial customer base and extend the cloud to the edge – or to the machines.

The cloud plays an essential role in enabling industrial companies to cost-effectively store and process massive amounts of data to fulfill their vision for the Industrial Internet. But the cloud often offers low latency. Sending data to the cloud and bringing it back to the edge is inefficient for making real-time decisions, which limits customers' ability to optimize their assets and operations. They need the capability to put analytics at the edge, on any device or machine.

Today, GE unveiled the Predix System™ – software architecture and services designed to make any machine an intelligent asset and to bring visibility, control and analytic insights to every part of industrial infrastructure and operations. This new set of components can run on a variety of operating systems,

devices and form factors – from sensors and controllers to gateways, server appliances and the cloud – making Predix a distributed system for the Industrial Internet and a complete "edge-to-cloud" offering.

This strategy reinforces GE's approach to the edge and incorporates other GE devices, such as Field Agent, a component of GE's Industrial Internet Control System (IICS). IICS quickly, reliably and securely connects thousands of machines to the cloud, bringing computing to the edge with 100 times the computing power of a standard control system.

In addition to updates to the platform, GE also launched new Predix-based solutions, designed to help customers harness the power of the Industrial Internet:

- **Current, powered by GE** introduced a new solution for digital energy management, designed to analyze and optimize energy use and operational efficiency use across lighting, HVAC and other systems. Restaurant, retail and commercial businesses are using the solution to see exactly where and when energy is being used in real time. The powerful software allows them to do not only historic, but also predictive and prescriptive analytics. Customers already using this tool include McDonald's and Simon Property Group.

- **GE Energy Connections** unveiled Digital Substation, which extends the maintenance optimization benefits of GE's Asset Performance Management software to the electricity grid. Eight percent of all generated electricity never reaches its intended customer due to grid outages. GE's Digital Substation is designed to enhance the reliability of a critical element of electrical grids and optimize the total use of assets.

- **GE Healthcare** expanded partnerships in its Health Cloud, including important partnerships in deep learning, collaboration and analytics. Cloud-enabled patient outcomes are linking clinical feedback to transformative radiology pathways. The GE Health Cloud will improve clinical outcomes and productivity, while opening new revenue streams.

- **GE Oil & Gas** launched Predictive Corrosion Management, a new Asset Performance Management (APM) solution that provides continuous inspection data and cloud-based analytics of pipe conditions to help operators manage corrosion-related risk, improve uptime, and minimize the total cost of operations. Predictive Corrosion Management couples GE's Rightrax PM ultrasonic sensors with the Predix operating system to enable "digital inspection."

- **GE Power** introduced a new release of its Digital Power Plant software for gas, steam and nuclear plants, which features new tools to help customers reduce unplanned downtime by up to 5%, reduce false positive alerts by up to 75%, and reduce operations and maintenance costs by up to 25%. It also includes software that provides power producers with accurate and timely plant operating capacity information, which energy traders can use to generate incremental revenues.

- **GE Renewable Energy** introduced the Digital Hydro Plant, a suite of apps combining both software and hardware solutions designed to support Hydro customers globally, helping them get the most out of assets over the lifetime of a plant. The Digital Hydro Plant complements GE's Digital Wind Farm, Digital Power Plant for Gas and Digital Power Plant for Steam, enhancing power generation reliability, efficiency, cybersecurity and profitability – targeted to reduce maintenance costs by up to 10%, increase plant availability by as much as 1% and boost revenues by up to 3%.

ACQUISITIONS OF BIT STEW SYSTEMS, WISE.IO ACCELERATE DIGITAL INDUSTRIAL TRANSFORMATION

GE Digital announced it has acquired Bit Stew Systems to bring its data intelligence capabilities to Predix and other industrial solutions. Bit Stew applies its machine learning and artificial intelligence (AI) capabilities to automate the process of data modeling, mapping and ingestion, accelerating time to value for customers, such as BC Hydro, Pacific Gas & Electric and Scottish & Southern Energy. This acquisition will help GE Digital provide a solution to organize large amounts of data through efficient data organization at the edge or at the source of the data – the asset.

Integration of Bit Stew's technologies into the Predix platform will provide improved ability to integrate data while it is in motion – from the edge to the cloud – and will allow industrial companies to gain better insight into data coming from the edge. This combined capability provides customers with a solution to efficiently organize large amounts of data at the source, enabling more rapid realization of Industrial Internet value.

GE Digital also acquired Wise.io, a leading machine learning and intelligent systems company. This acquisition will enable GE Digital to further accelerate development of advanced machine learning and data science offerings in the Predix platform. The Wise.io team deepens GE's machine learning stack and will spearhead innovative solutions in GE's vertical markets to develop its machine learning offerings. Current Wise.io customers include Pinterest, Twilio and Thumbtack.

Industrial machine learning is critical to GE's development of scalable Digital Twin solutions and data-intensive industrial computing challenges. Running on Predix, Digital Twins are virtual twins of an industrial asset – a jet engine, a wind turbine or an entire power plant. Twins continuously collect data from physical and virtual sensors and rely on advanced machine learning techniques to analyze the data to gain insights about performance and operation. Wise.io's deep machine learning expertise – combined with GE Digital's existing data science talent and massive portfolio of industrial assets – will advance GE's Digital Twin capabilities and solidify its role as a leader in industrial machine learning.

This news follow GE's recent acquisition of ServiceMax, a leader in cloud-based field service management solutions, which enables GE Digital customers to immediately gain more productivity from their assets and find greater efficiency in their field service processes. Other GE acquisitions in the digital industrial space include Meridium and Wurldtech.

GROWING THE DIGITAL INDUSTRIAL ECOSYSTEM

The expansion of products and services for the Industrial Internet mirrors the increasing number of global businesses contributing to the growth of the digital industrial ecosystem.

GE also announced a program dedicated to independent software vendors (ISVs), aimed at spurring development of industrial solutions and extending the reach of the Predix platform. Through these partnerships, GE will share its industry expertise and allow partners to use Predix as the building block for new industrial applications to enhance various components of industrial operations – such as maintenance, content development and asset management. Ultimately, customers will have greater access to these new solutions and will more quickly see outcomes, enabled by the cloud.

No platform has been successful without involvement from ISVs—they are a force multiplier and provide a new stream of revenue for GE. Inaugural launch partners include: Box, Decisyon App Composer, Entercoms, Ericsson, Mobideo, Nurego, OAG Analytics, Pitney Bowes and Splunk. The addition of ISVs enhances the growing ranks of the GE Digital Alliance Program, which launched in February. The alliance program now boasts more than 270 partners around the world, including major enterprise players such as AT&T, EY, Intel, Microsoft and Tata Consultancy Services (TCS).

To further expand the digital industrial ecosystem, GE Digital also opened two foundries in 2016 in Paris and Shanghai, in addition to its flagship foundry in San Ramon, Calif. The foundries comprise a global network of sites where GE Digital incubates Industrial Internet startup companies, collaborates with customers on new application development, and works to extend and promote GE's international developer ecosystem.

GE Digital's footprint grew in the U.S. as well, opening new IT sites in Atlanta, Miami and Providence that serve as technology hubs, global IT operations and application development centers. GE Digital will also expand its San Ramon headquarters to 350,000 square feet to accommodate the fast-growing organization. GE Digital will have a global network of 11 foundries and six additional centers by 2020.

CUSTOMER ADOPTION OF PREDIX APPLICATIONS AND SERVICES

Predix is the foundation of the industrial app economy, an ecosystem of software and services that allow businesses to use data and analytics to improve operations, increase productivity and drive new revenue streams. Industrial Internet offerings are already boosting GE's services margins and organic industrial growth. New partnerships are helping to solidify GE's position as the most promising in the $225 billion industrial software market.

GE has seen growing adoption of Industrial Internet technologies and solutions among its customers, spanning energy, healthcare and transportation, including:

- **BP** and GE Oil & Gas announced the startup of Plant Operations Advisor (POA), a new digital solution designed to improve the efficiency, reliability and safety of BP's oil and gas production

operations. Plant Operations Advisor is already helping BP manage the performance of one of its platforms in the Gulf of Mexico, and subject to a successful pilot, it will be deployed next year to other BP facilities around the world. The global deployment is expected to be the largest-scale deployment of GE's Predix-powered APM technology to date.

- **Exelon**, a Fortune 100 energy company, has chosen GE's Predix to accelerate its digital transformation. Exelon is the first GE Power customer to sign an enterprise software license, deploying GE's entire suite of Predix solutions across the company's 33GW nuclear, hydroelectric, wind, solar and natural gas facilities. Exelon and GE software engineers will also co-innovate and collaborate to build next-gen SaaS applications using the Predix platform.

- **NEC Corporation** is collaborating with GE Digital to deploy the Predix platform as part of NEC's global supply chain improvement project. Through its use of Predix, NEC will optimize its supply chain and factory operations, with the intent to achieve a substantial reduction in operational costs.

- **The Port of Los Angeles**, the largest port in the U.S., and GE Transportation are launching a pilot portal where cargo shipment data will be digitized and shared through a secured, common user portal. Critical cargo conveyance data will be digitized and shared among supply chain stakeholders to ensure that millions of shipping containers with retail inventories move efficiently through ports and into the marketplace, so customers get what they want, when they want it.

- **Teledyne Controls**, the world's leading provider of wireless data acquisition and management technology, and GE Aviation announced a strategic partnership to transform aircraft engine health monitoring by using the Predix platform and Teledyne's GroundLink® technology to apply data and analytics on continuous flight data to arm customers with more effective engine maintenance operations.

- **UC San Francisco's Center for Digital Health Innovation** and GE Healthcare announced a partnership to create a library of algorithm-based apps to address multiple diseases, disorders and clinical procedures. The apps will be deployed worldwide via the GE Health Cloud and smart GE imaging machines, expanding access to UCSF's clinical, scientific and technological expertise and the power of GE's medical technologies and services to clinicians around the world.

As adoption of Predix continues to expand, new microservices are helping to fuel a boom in applications and services built on top of the platform. More than 100 industrial apps are running on Predix today.

About Minds + Machines

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About GE

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About GE Digital

GE Digital connects streams of machine data to powerful analytics, providing Industrial companies with valuable insights to manage assets and operations more efficiently. World-class talent and software capabilities driving big gains in productivity, availability and longevity. For more information, visit the website at www.ge.com/digital.

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