Rise of the Industrial Internet

The machines are talking
The Industrial Internet combines intelligent machines, advanced analytics, and people at work in ways that dramatically improve productivity and efficiency. For the first time in history, remotely distributed machines across the globe – from MRIs to wind turbines to aircraft engines – can be monitored in real time, unlocking the language of machines and opening tremendous benefits. With better health outcomes at a lower cost, boosted energy production, substantial savings in fuel, and better performing and longer-lived physical assets, the Industrial Internet will allow us to promote sustainability and savings around the world. With a deep industrial experience and our investment in technology, predictive analytics, and data science, GE is positioned to deliver solutions that help our customers harness the potential of the Industrial Internet.

Follow the revolution: @GESoftware and #IndustrialInternet

Introducing GE Software

- Igniting the next Industrial Revolution by connecting minds and machines
- Launched in 2011 with $1 billion invested across GE over three years
- Hiring the best and brightest talent in software development, architecture, data science, design and experiences, cyber security, and more
- Silicon Valley headquarters with regional Software Centers of Excellence in India, Europe, and China
- Building an ecosystem of industry-leading partnerships and strategic investments to share our expertise, catalyze complementary development, and extend our reach

GE Software provides integrated solutions
GE Software works with more than 10,000 software engineers across GE’s business divisions to ensure that our customers in all sectors can tap into the power of the Industrial Internet. Our approach is built around a common software platform, agile development, and shared services.

Predix™

Predix™ is GE’s software platform for the Industrial Internet. Predix enables asset and operations optimization by providing a standard way to run industrial-scale analytics and connect machines, data, and people. Deployed on machines, on-premise, or in the cloud, Predix combines an industry-leading stack of technologies for distributed computing and big data analytics, asset data management, machine-to-machine communication, and mobility.

Predix powers Predictivity
GE Predictivity™ solutions provide advanced technology for asset and operations optimization across a wide range of industrial sectors. Forward-thinking business leaders embrace Predix to run their Predictivity solutions to minimize unplanned downtime, maximize profits, and manage risk.

Learn more at GESoftware.com/Predix
Healthcare
Improving the patient experience while controlling operating costs is a primary driver for health care providers today. Predictivity solutions for healthcare accomplish these goals with mobile assets management, patient flow solutions, and improvements in the care facility hygiene and workforce management.

Aviation
In the competitive world of aviation, Predictivity drives down the single greatest cost component for airlines by increasing fuel efficiency up to 2%. More efficient operations, predictive maintenance, and improvements in customer satisfaction and safety are all addressed by big data analytics in the Predictivity aviation suite of solutions.

Manufacturing
Manufacturers today face challenges around consumer safety, regulatory controls, operating costs, and production schedules. Predictivity solutions address these needs with analytics that drive faster product production, reduce rework (material) costs, reduce lab/sampling costs, improve compliance and HACCP HARPC management, and minimize the impact of a recall.

Mining
Mining leaders today have a new mandate: improve margins by reducing operating costs and increase productivity. Predictivity solutions for mining reduce unplanned downtime by anticipating equipment issues; optimizing operations such as grinding, flotation, and refining; shifting to efficient proactive processes; and reducing energy costs.

GE Predictivity™
GE Predictivity Industrial Internet solutions use big data from intelligent machines and predictive analytics to optimize assets and operations, resulting in powerful business outcomes for customers. Through GE’s unique industry knowledge, combined with innovations in analytic development, customers benefit from greater reliability, reduced operating costs, improvement in environmental controls, and increased profitability.
Wind
In a world of changing subsidies, the wind energy industry is continually investing to improve project economics and achieve the lowest cost of energy. Predictivity solutions for wind drive up to 5% improvement in power output by using analytics to drive a set of performance dials and levers to fine tune a wind turbine's operation and help enhance its energy production.

Power Distribution
Safely and reliably meeting power demands while controlling operating costs is the guiding principle for utilities today. Predictivity solutions include analytics that monitor and manage the power grid, bring insights from advanced meter data for revenue protection and load forecasting, and help maintain public and environmental safety.

Water & Process Technologies
Heavy processing industries, manufacturers, and power generators must maintain efficient production operations to remain competitive and enjoy profitable growth. Predictivity solutions for water and chemical processing provide a comprehensive view of total operations, alerting operations staff about the exact cause of a system issue and identifying how it will likely impact downstream operations.

Power Generation
Improving reliability, generating higher output, creating efficiencies, and increasing part load capability are all objectives for today’s energy producers. Predictivity solutions help achieve these goals by extending operating hours with predictive maintenance, maximizing fuel usage, and fine tuning turbine operations for greatest efficiency. Gas, steam, and aero derivative turbines and operations are addressed with Predictivity solutions.

Rail Transportation
As reliance on freight rail continues to grow, so will the need for increased capacity and efficiency on the rail network. Predictivity solutions for rail increase network velocity by optimizing rail usage, increase fuel efficiency with automated speed controls, improve locomotive availability with predictive maintenance, and create an efficient closed loop with suppliers for rapid repairs.

Oil & Gas
Oil & gas companies are examining ways to remain competitive and position for growth in a challenging environment with increasing production costs and a dwindling workforce. Predictivity solutions deliver field, subsea, plant, and pipeline issue detection and improved reliability with predictive maintenance, collaboration tools to share industry knowledge, and analytics that drive increased productivity.

Oil & Gas

Power Distribution

Water & Process Technologies

Power Generation

Rail Transportation

Wind

Learn more at GESoftware.com/Predictivity
Shared Capabilities Portfolio

To advance the Industrial Internet and collaborate with GE’s business divisions, GE Software offers expertise and resources in the following areas:

- **Architecture**
  Defining new business and delivery models for software and services

- **Advanced Research**
  Developing and deploying scalable predictive software solutions to enable Industrial Internet programs

- **Data Science**
  Transforming raw data into insights and opportunities through descriptive, predictive, and prescriptive analytics

- **Development**
  Using agile development and lean start-up principles to develop applications and software solutions for asset optimization and operations optimization

- **User Experience (UX)**
  Augmenting human perception to help in complex decision making to drive revenue growth

- **Cyber Security**
  Focusing on security management strategies to detect and prevent risks to data, assets, and intellectual property

- **Cloud Services**
  Providing a unified, service-based solution on a protected, fully-automated network

- **Commercial Strategy**
  Optimizing the software portfolio to maximize market success
GE Software Research Capabilities

Multiple research labs have been created to focus on software and analytics and to support GE’s initiatives related to the Industrial Internet. These labs bring together employees with specific expertise and skills to collaborate with GE businesses and customers on projects advancing our software solutions and platform. Examples include:

The Advanced Computing Lab optimizes computing architectures for resiliency, scalability, and robustness; benchmarks emerging and disruptive computing hardware and software for commercial adoption; and accelerates innovation through high performance simulation and computational modeling.

The Collaboration and Mobility Lab conceives, develops, and delivers Industrial Internet-integrated collaborative environments. Research areas include interactive multi-modal communication, device-agnostic mobile information access, and related data analytics technologies.

The Distributed Intelligent Systems Lab develops systems and architectures that allow assets to be connected, intelligent, and social. Core research focus areas include machine to machine (M2M), cognitive/agent based, and robotic systems.

The Human-Systems Interaction Lab focuses on users, their needs, and emerging experience technologies to work more effectively and productively. Research areas include collaboration, decision making, knowledge engineering, analytics visualization, and natural user interface technologies.

The Industrial Internet Analytics Lab develops data-driven analytics solutions enabling prediction, modeling, and analysis of both structured and unstructured industrial data.

The Machine Learning Lab develops data-driven prognostics and predictive modeling methods derived from sensor and attribute data sources. The group’s areas of expertise include ensemble classifiers, data fusion, case-based learning, support vector machines, and deep learning.

The Modeling and Optimization Lab creates innovative technologies in statistical analytics and operations research. Areas of innovation include industrial data quality algorithms and systems, statistical analytics on large time series data, predictive modeling, and optimization algorithms.

The Sensor and Signal Analytics Lab analyzes sensor waveforms and data from assets to minimize unplanned downtime and provide intelligence to maximize profit from operations.
GE Design Center

GE Software built its industry-leading Design Center as a catalyst for innovation to enable people with different perspectives to discover the “what” and “why” and to do it faster than traditional environments permit.

The GE Design Center brings together the ingredients for the software innovation process – collaboration, vision, and creation – in an environment that helps us identify, anticipate, plan, and adapt, so we find powerful new ways to make our customers successful.

The GE Design Center provides a variety of engagement offerings such as design thinking, new product prototyping and commercial strategy, user experience, developer tools, and data science to create experiences for GE businesses and their customers to drive innovation and generate ideas that extend beyond what’s currently possible. Through research, data analysis, problem framing, immersion, insight synthesis, and observation, cross-functional teams develop creative solutions to bring a better future to our customers.

Careers at GE Software

GE Software offers opportunities for career growth, a collaborative environment, and work that has powerful, positive impacts on the world. We are actively recruiting the best and the brightest in software development, product management and marketing, user experience, data science, research, and more.

GE Software’s headquarters are based in the San Francisco Bay Area, a fast-growing region with great property values, excellent schools, and close proximity to entertainment venues and outdoor recreation areas.

Our green-certified facility and open work spaces reflect our culture of collaboration and our commitment to innovation. Convenient transit options are available, including GE shuttle buses and Bay Area Rapid Transit (BART).

Learn more at GESoftware.com/Careers

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