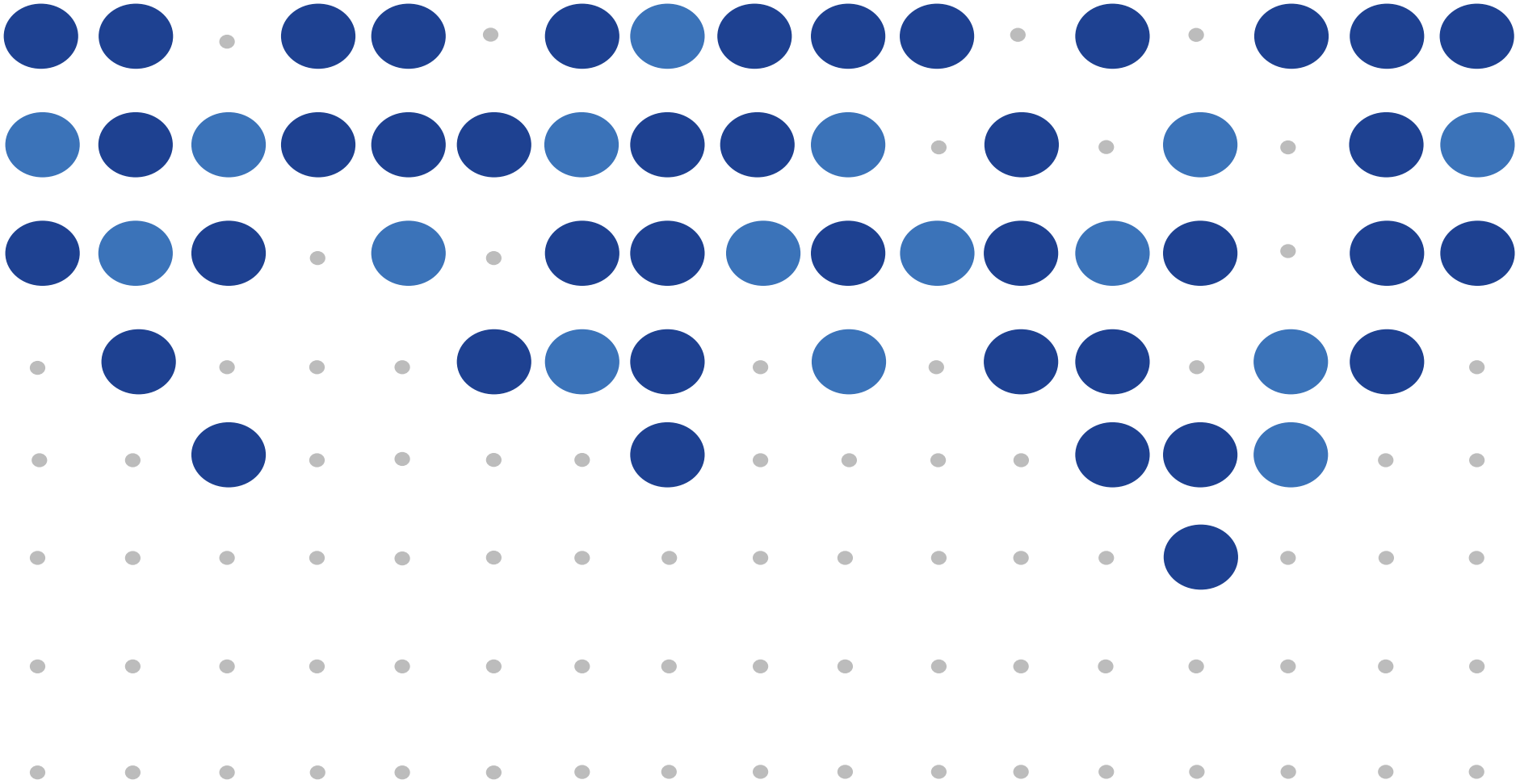

Bill Ruh

Vice President
GE Software

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Forward Looking Statements

Caution Concerning Forward-Looking Statements:
This document contains "forward-looking statements" – that is, statements related to future, not past, events. In this context, forward-looking statements often address our expected future business and financial performance and financial condition, and often contain words such as "expect," "anticipate," "intend," "plan," "believe," "seek," "see," or "will." Forward-looking statements by their nature address matters that are, to different degrees, uncertain. For us, particular uncertainties that could cause our actual results to be materially different than those expressed in our forward-looking statements include: current economic and financial conditions, including volatility in interest and exchange rates, commodity and equity prices and the value of financial assets; potential market disruptions or other impacts arising in the United States or Europe from developments in the European sovereign debt situation; the impact of conditions in the financial and credit markets on the availability and cost of General Electric Capital Corporation's (GECC) funding and on our ability to reduce GECC's asset levels as planned; the impact of conditions in the housing market and unemployment rates on the level of commercial and consumer credit defaults; changes in Japanese consumer behavior that may affect our estimates of liability for excess interest refund claims
(GE Money Japan); pending and future mortgage securitization claims and litigation in connection with WMC, which may affect our estimates of liability, including possible loss estimates; our ability to maintain our current credit rating and the impact on our funding costs and competitive position if we do not do so; the adequacy of our cash flow and earnings and other conditions which may affect our ability to pay our quarterly dividend at the planned level; GECC's ability to pay dividends to GE at the planned level; our ability to convert pre-order commitments into orders; the level of demand and financial performance of the major industries we serve, including, without limitation, air and rail transportation, energy generation, real estate and healthcare; the impact of regulation and regulatory, investigative and legal proceedings and legal compliance risks, including the impact of financial services regulation; our capital allocation plans, as such plans may change and affect planned share repurchases and strategic actions, including acquisitions, joint ventures and dispositions; our success in completing announced transactions and integrating acquired businesses; the impact of potential information technology or data security breaches; and numerous other matters of national, regional and global scale, including those of a political, economic, business and competitive nature. These uncertainties may cause our actual future results to be materially different than those expressed in our forward-looking statements. We do not undertake to update our forward-looking statements.
"This document may also contain non-GAAP financial information. Management uses this information in its internal analysis of results and believes that this information may be informative to investors in gauging the quality of our financial performance, identifying trends in our results and providing meaningful period-to-period comparisons. For a reconciliation of non-GAAP measures presented in this document, see the accompanying supplemental information posted to the investor relations section of our website at www.ge.com."
"In this document, "GE" refers to the Industrial businesses of the Company including GECC on an equity basis. "GE (ex. GECC)" and/or "Industrial" refer to GE excluding Financial Services."
GE's Investor Relations website at www.ge.com/investor and our corporate blog at www.gereports.com, as well as GE's Facebook page and Twitter accounts, contain a significant amount of information about GE, including financial and other information for investors. GE encourages investors to visit these websites from time to time, as information is updated and new information is posted.

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GE Software

GE Software relies on a sustained effort in technological innovations and extensive experience in sensors & instrumentation, modeling, advanced analytics and software development to deliver outcomes to customers that drive the Industrial Internet.

Building a Silicon Valley presence

Focused on software & analytics

Workforce of 500+ people hired in 2 years

Targeting workforce of 1000 people

Award winning facility

Gold LEED

Open architecture & state of the art design

Shared services

Innovation driven approaches such as lean start up, agile development and extreme programming

GE digital architecture for industrial solutions

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Big Industry Trends

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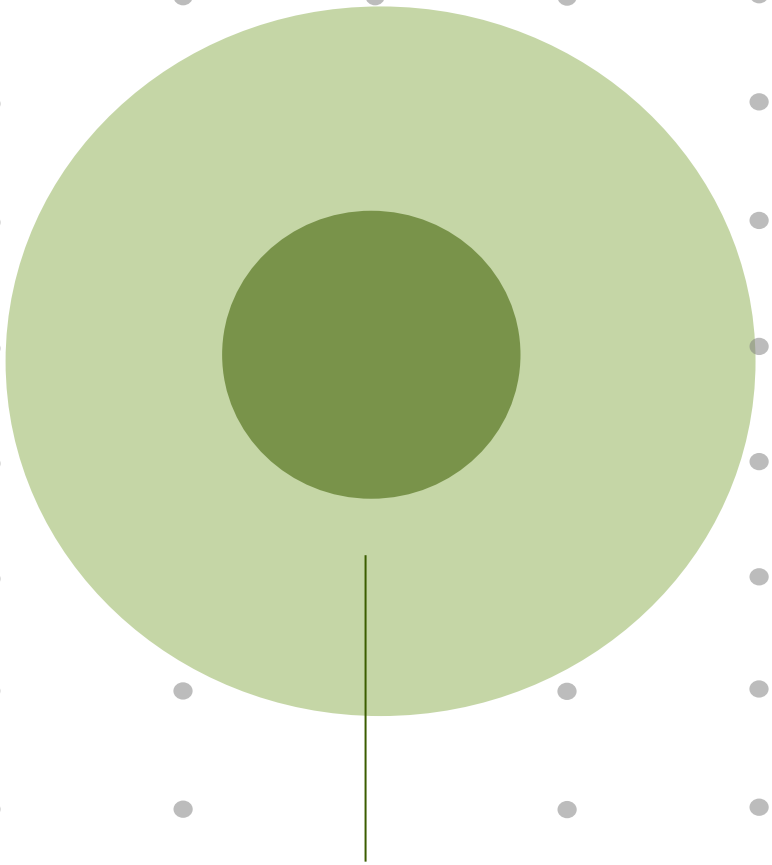
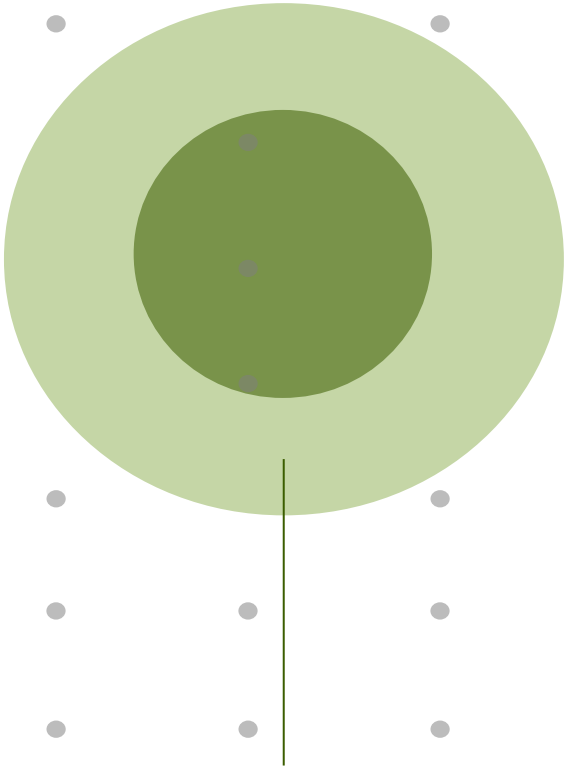
#1. More Big Data





Industrial data will grow **2X** rate of any other big data segment

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We Used to Get…

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Now Let's Use It…

Air Speed Calibrated
Altitude
Carrier Name
Core Compartment Cooling Valve Position
Core Speed
Date GE Received
Departure Station
Destination Station
EGT Exhaust Gas Temperature
EGT1
EGT2
EGT3
EGT4
EGT5
EGT6
EGT7
EGT8
Engine Serial Number
FMV Position
FMV Position Demand
Fuel Filter Delta Pressure
Fuel Flow
Ground Speed
Mach Number
Message Type
N1 Fan Speed without modifier
N1 Indicated Fan Speed
N1 Maximum Fan Speed
N1 Modifier
Oil Filter Delta Pressure
Oil Pressure
PS3 Compressor Discharge Pressure
T25 Compressor Inlet Temperature
T3 Compressor Discharge Temperature
Time GE Received
Total Air Temperature Aircraft
Total Air Temperature Engine
VBV Position
Vibration N1 Phase Angle #1 Bearing
Vibration N1 Phase Angle Turbine Frame
VSV Position
Aircraft ID
Aircraft Pitch Angle
Aircraft Roll Angle
Control System Status Word 1
Control System Status Word 2
DMS Cumulative Chip Count
DMS Per Flight Chip Count
EMU Status Word 1
ENGINE_RATING
Engine Bump
Engine Position
FADEC AS Software Version Id
FADEC Hardware P/N
FSV Demand
FSV Main Demand
FSV Position
Fuel Boost Strainer Delta Pressure
Fuel Density Center Tank
Fuel Flow Demand
Fuel Manifold Pressure
Fuel Manifold Temperature
HPTACC Demand
HPTACC Position
LPTACC Demand
LPTACC Position
MSV Demand
MSV Position
Minor Airframe Model Word
Oil Quantity Aircraft
Oil Supply Temperature
P0 Ambient Pressure
PS25 Compressor Inlet Pressure
PT2 Inlet Total Pressure
Report Code
T12 Inlet temperature
TBV Demand
Aircraft Corrected Angle of Attack

Aircraft Gross Weight
AVM High Wins Select Vibration
Bleed flow engine
EEC Temperature
FLAP Position
Flight Number ACMS
Flight Phase ACMS
IDG Load
RADIO_ALTITUDE
Software ID ACMS
Temperature Static Air
APU Bleed Isolation Valve Close Switch
APU Bleed Isolation TBV Position
TCORE Nacelle Temperature
TOIL Oil Scavenge Temperature
Throttle Resolver Angle
VBV Demand
VSV Demand
Vib Broadband #1 Bearing - Engr Units
Vib Broadband TF - Engr Units
Vibration N1 #1 Bearing - Engr Units
Vibration N1 Turbine Frame - Engr Units
Vibration N2 #1 Bearing - Engr Units
Vibration N2 Turbine Frame - Engr Units
A/I valve position Wing
Valve Duct Switch
AVM Broadband Cockpit units
AVM Fan Vibration Cockpit units
AVM N1 Vibration Cockpit units
AVM N2 vibrations Cockpit units
Air Speed Calibrated - SS
Altitude - SS
Bleed Flow Engine
Control System Status Word 1
Control System Status Word 2
Copy Number EMU
Core Speed - SS
EAI Switch Position - SS
EAI Switch Position Open/Closed
ECS Pack 1 Flow
ECS Pack 1 High/Low
ECS Pack 2 Flow
ECS Pack 2 High/Low
ECS Pack 3 Flow
ECS Pack 3 High/Low
EEC Subsystem Status Word 2
EGT Exhaust Gas Temp Unshunted - SS
EGT Exhaust Gas Temperature -SS
EGT Exhaust Gas Temperature Display
EGT1 - SS
EGT2 - SS
EGT3 - SS
EGT4 - SS
EGT5 - SS
EGT6 - SS
EGT7 - SS
EGT8 - SS
FICAS Message #3
FICAS Message #4
EMU Status Word 2
Engine Rating Word
Engine Vibration display discrete bits
FADEC Channel Discretes
FADEC N1 Max Takeoff - SS
FSV Position - SS
Fan Air Valve Position Open/Closed
Flight Leg Number ACMS
Fuel Density 1
Fuel Density 2
Fuel Density 3
Fuel Density 4
Fuel Flow - SS
Fuel Temperature
HP ShutOff Valve Position Open/Closed
IDG OIL TEMP IN
IDG OIL TEMP OUT
Isolated Fault Maint. Word 01

Isolated Fault Maint. Word 02
Isolated Fault Maint. Word 03
Isolated Fault Maint. Word 04
Isolated Fault Maint. Word 05
Isolated Fault Maint. Word 06
Isolated Fault Maint. Word 07
Isolated Fault Maint. Word 08
Isolated Fault Maint. Word 09
Isolated Fault Maint. Word 10
Isolated Fault Maint. Word 11
Isolated Fault Maint. Word 12
Isolated Fault Maint. Word 13
Isolated Fault Maint. Word 14
Isolated Fault Maint. Word 15
Isolated Fault Maint. Word 16
Isolated Fault Maint. Word 17
Isolated Fault Maint. Word 18
Isolated Fault Maint. Word 19
Isolated Fault Maint. Word 20
Isolated Fault Maint. Word 21
Isolated Fault Maint. Word 22
Left Bleed Iso Valve Close Switch F/D
Left Bleed Isolation Valve Position
Left Bleed Pressure
Left Bleed Temperature
N1 Fan Speed without modifier - SS
N1 Indicated Fan Speed - SS
Nacelle Anti-Ice Valve Pos Open/Closed
P38 Bleed Port Pressure
R Inbd or Outbd WAI Valve Close Switch F/D
R Inbd or Outbd WAI Valve Disagree
R Inbd or Outbd WAI Valve Open
Right Bleed Iso Valve Close Switch F/D
Right Bleed Isolation Valve Position
Right Bleed Pressure
Right Bleed Temperature
Selection Status Word
T25 Compensated
T3 Compensated
Total Air Temperature Aircraft - SS
Vib Broadband #1 Brng - Engr Units - SS
Vib Broadband TF - Engr Units - SS
Vib N1 #1 Bearing - Engr Units - SS
Vib N1 Phase Angle #1 Bearing - SS
Vib N1 Phase Angle Turbine Frame - SS
Vib N1 Turbine Frame - Engr Units - SS
Vib N2 #1 Bearing - Engr Units - SS
Vib N2 Turbine Frame - Engr Units - SS
WAI Valve Position
VBV Position Selection Status
Actual Calculated HPT Clearance
Aircraft CAI Multiplier
Aircraft ECS Multiplier
Aircraft WAI Multiplier
Calculated Ambient Temp
Calculated FMV Fuel Flow
Center System Hydraulic Pressure
Center Tank Fuel Temperature
Core Comp Cooling Valve Pos Sel Status
Core Speed Selection Status
Cumulative Engine Run Time
ECU On Time
EGT Exhaust Gas Temperature Sel Status
EGT Probe Hard Soft Fault Word
EMU Hardware Part Number
EMU Health Word
EMU Level C AS Part Number
EMU Level E AS Part Number
EMU Level E User Modifiable SW P/N
EMU Maintenance Word 01

EMU Maintenance Word 02
EMU Software Version Code
Engine Configuration Value
Engine Health Monitor Config Value
Engine Oil Level
Engine Oil Level Validation Status
FADEC Channel Discretes
FADEC NVM Software Version Id
FADEC OS Software Version Id
FMV Error
FMV Position Selection Status
FMV Servo Stabilizer Term
FSV Acoustic Max Main
FSV LBO Max Main
FSV Max Regulator
FSV Min Open Main
FSV Min Pit Phi Main
FSV Min Regulator
FSV TM Current Demand
Flight Leg Number EMU
Flight Number EMU
Flight Phase EMU
Fuel Boost Strainer Delta P Sel Status
Fuel Density Left Tank
Fuel Density Right Tank
Fuel Filter Delta Pressure Sel Status
Fuel Flow Demand Sel Status
Fuel Manifold Pressure Sel Status
GCU1 Generator Load
GCU2 Generator Load
HPTACC Error
HPTACC Selection Status
HSSB Aircraft Discrete Word 1
HSSB Aircraft Discrete Word 2
HSSB Aircraft Discrete Word 3
HSSB FADEC Fault Discrete Word
Isolated Fault Maint. Word 01 Ch A
Isolated Fault Maint. Word 01 Ch B
Isolated Fault Maint. Word 02 Ch A
Isolated Fault Maint. Word 02 Ch B
Isolated Fault Maint. Word 03 Ch A
Isolated Fault Maint. Word 03 Ch B
Isolated Fault Maint. Word 04 Ch A
Isolated Fault Maint. Word 04 Ch B
Isolated Fault Maint. Word 05 Ch A
Isolated Fault Maint. Word 05 Ch B
Isolated Fault Maint. Word 06 Ch A
Isolated Fault Maint. Word 06 Ch B
Isolated Fault Maint. Word 07 Ch A
Isolated Fault Maint. Word 07 Ch B
Isolated Fault Maint. Word 08 Ch A
Isolated Fault Maint. Word 08 Ch B
Isolated Fault Maint. Word 09 Ch A
Isolated Fault Maint. Word 09 Ch B
Isolated Fault Maint. Word 10 Ch A
Isolated Fault Maint. Word 10 Ch B
Isolated Fault Maint. Word 11 Ch A
Isolated Fault Maint. Word 11 Ch B
Isolated Fault Maint. Word 12 Ch A
Isolated Fault Maint. Word 12 Ch B
Isolated Fault Maint. Word 13 Ch A
Isolated Fault Maint. Word 13 Ch B
Isolated Fault Maint. Word 14 Ch A
Isolated Fault Maint. Word 14 Ch B
Isolated Fault Maint. Word 15 Ch A
Isolated Fault Maint. Word 15 Ch B
Isolated Fault Maint. Word 16 Ch A
Isolated Fault Maint. Word 16 Ch B
Isolated Fault Maint. Word 17 Ch A
Isolated Fault Maint. Word 17 Ch B
Isolated Fault Maint. Word 18 Ch A
Isolated Fault Maint. Word 18 Ch B
Isolated Fault Maint. Word 19 Ch A
Isolated Fault Maint. Word 19 Ch B
Isolated Fault Maint. Word 20 Ch A

Isolated Fault Maint. Word 20 Ch B
Isolated Fault Maint. Word 21 Ch A
Isolated Fault Maint. Word 21 Ch B
Isolated Fault Maint. Word 22 Ch A
Isolated Fault Maint. Word 22 Ch B
LPTACC Error
LPTACC Selection Status
LPTACC Servo Stabilizer Term
Left Tank Fuel Temperature
MSV Position Selection Status
MSV TM Current Demand
Mach Number Selection Status
N1 Fan Speed Selection Status
N1 Trim
Oil Filter Delta Pressure Sel Status
Oil Pressure Selection Status
Oil Quantity Aircraft Validation Status
Oil Supply Temperature Sel Status
P0 Ambient Pressure Selection Status
PS13 Calculated by FADEC CLM
PS25 Compressor Inlet Press Val Status
PS3 Compressor Disch Press Sel Status
PT2 Inlet Total Pressure Sel Status
Right Tank Fuel Temperature
Selected Fuel Tank Source
T12 Inlet Temperature Selection Status
T13 Calculated by FADEC CLM
T25 Compressor Inlet Temp Sel Status
T3 Compressor Discharge Temp Sel Status
TBV Error
TBV Position Selection Status
TBV Servo Stabilizer Term
TCORE Nacelle Temperature Sel Status
TM#1 Current Demand
TM#1 Wrap Current
TM#2 Current Demand
TM#2 Wrap Current
TM#3 Current Demand
TM#3 Wrap Current
TM#4 Current Demand
TM#4 Wrap Current
TM#5 Current Demand
TM#5 Wrap Current
TM#6 Current Demand
TM#6 Wrap Current
TM#7 Current Demand
TM#7 Wrap Current
TM#8 Current Demand
TM#8 Wrap Current
TOIL Oil Scavenge Temp Sel Status
Throttle Resolver Angle Sel Status
Total Air Temperature Engine Sel Status
Trigger Discretes
VBV Error
VBV Servo Stabilizer Term
VFSG HP Extraction
VFSG1 Oil Inlet Temperature
VFSG1 Oil Inlet Temperature Val Status
VFSG1 Oil Outlet Temperature
VFSG1 Oil Outlet Temperature Val Status
VFSG2 Oil Inlet Temperature
VFSG2 Oil Inlet Temperature Val Status
VFSG2 Oil Outlet Temperature
VFSG2 Oil Outlet Temperature Val Status
VSV Error
VSV Position Selection Status
VSV Servo Stabilizer Term
Ambient Temperature Subidle
Core Speed Subidle
EGT Subidle
Engine Shutdown Time Subidle
FADEC N1 Derate Takeoff
Oil Supply Temperature Subidle
TOIL Oil Scavenge Temperature Subidle

Dark Data:
IDC estimates that only 0.5% of the world's data is being analyzed.[1]

[1]IDC Digital Universe Study, sponsored by EMC, December 2012

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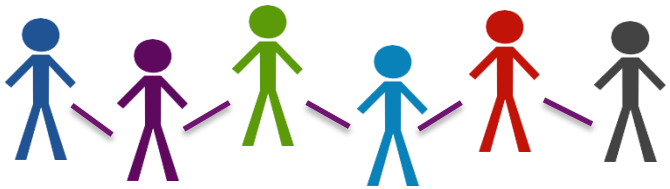
#2. Rise of the Machines

What Happened When 1B People Became Connected?



Entertainment is Digitized

Social Marketing Emerged

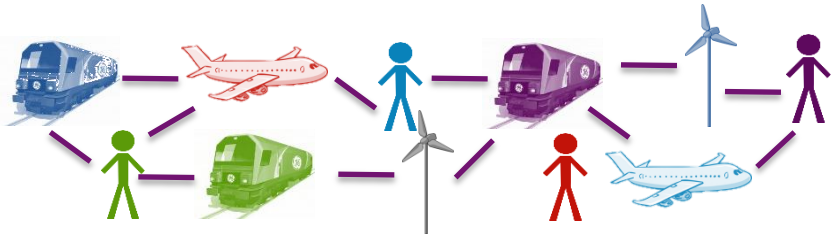
Communications Mobilized

IT Architecture Virtualized

Retail & Ad Transformed

Consumer Internet

What Happens When 50B Machines Become Connected?



Remote monitoring

Predictive Analytics

Virtualized OT

Machine Learning & Automation

Employee Productivity

Industrial Internet

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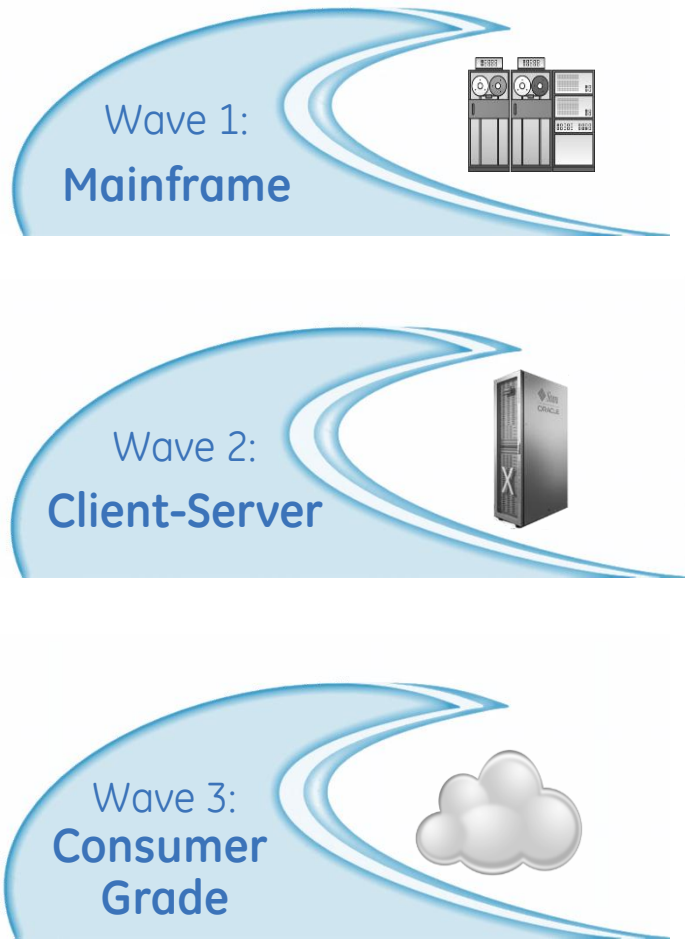
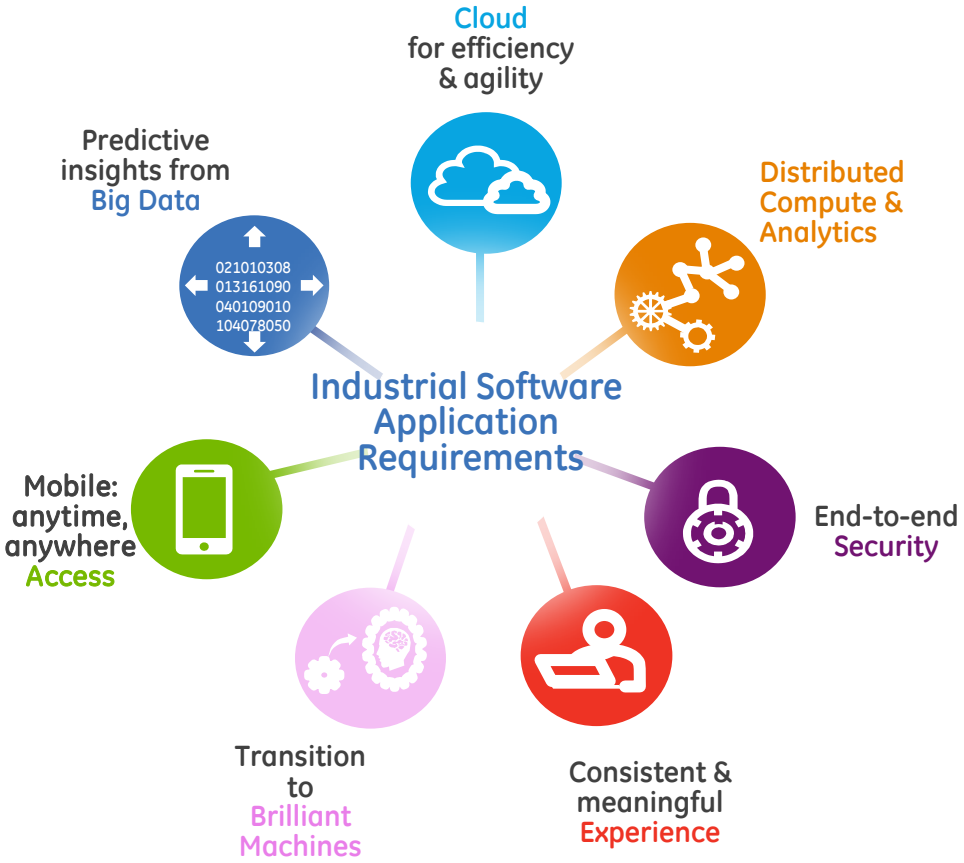
#3. Changing Architecture





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Driving Growth with Software-Based Services

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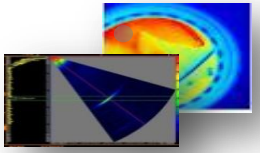
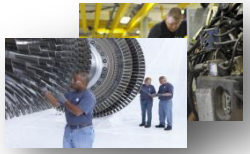
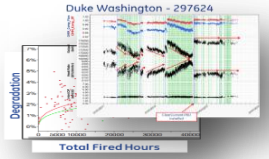
Lifecycle of a GE Machine

M&D	Sensors	Inspection	Repair	Performance	Machine Life
					
How is it doing.	What is it telling me.	What does it looks like.	Fix it at site or shop.	How does it perform.	How long will it last Without failure

Data and Analytics

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GE Predictivity™

Common Platform

Platform Capabilities

- Analytics
- Big data
- Asset mgmt.
- Mobility
- Cloud mgmt.

Infrastructure Capabilities

- Devices
- Data storage
- Controls
- Security
- Network

+

Predictivity Services

Asset Optimization

(Striving for zero unscheduled downtime!)

- Condition Based Maintenance
- Parts inventory management
- Monitoring & diagnostics

+

Operations Optimization

(Air traffic control for your industry!)

- Higher network throughput
- Controls & plant management
- Fuel use minimization

=

Outcomes that matter

- Lower inventory costs
- Lower maintenance costs
- Lower asset capex costs
- Striving for zero unscheduled downtime

=

- Lower fuel cost
- Lower opex cost
- Increased revenue

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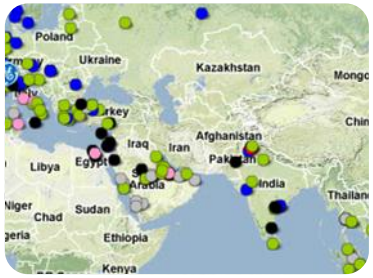
Value of Big Data Analytics

1 gas turbine compressor blade monitoring potential: 500 gigabytes per day



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How Do You Define Brilliance?

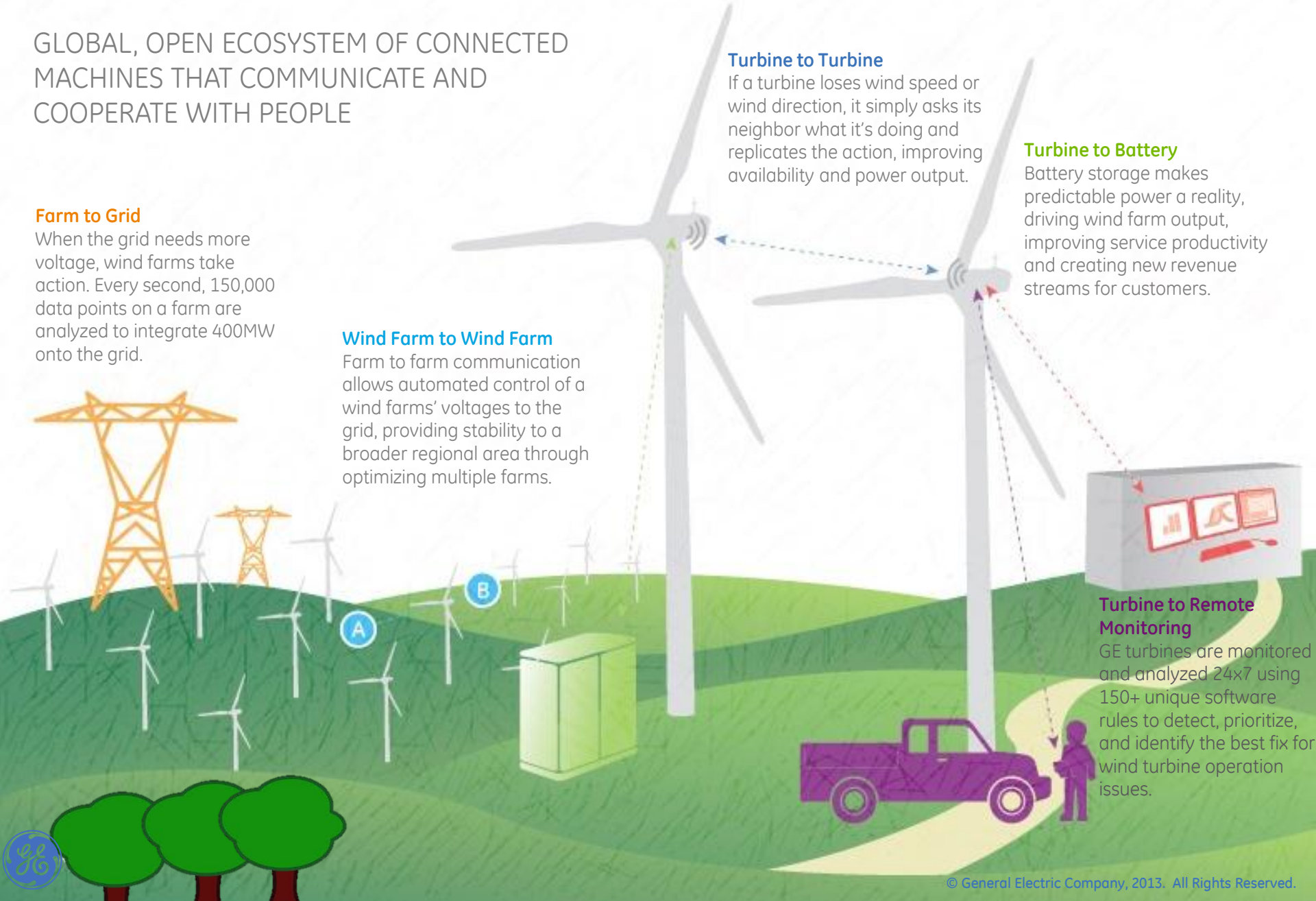
GLOBAL, OPEN ECOSYSTEM OF CONNECTED MACHINES THAT COMMUNICATE AND COOPERATE WITH PEOPLE

Farm to Grid
When the grid needs more voltage, wind farms take action. Every second, 150,000 data points on a farm are analyzed to integrate 400MW onto the grid.

Wind Farm to Wind Farm
Farm to farm communication allows automated control of a wind farms' voltages to the grid, providing stability to a broader regional area through optimizing multiple farms.

Turbine to Turbine
If a turbine loses wind speed or wind direction, it simply asks its neighbor what it's doing and replicates the action, improving availability and power output.

Turbine to Battery
Battery storage makes predictable power a reality, driving wind farm output, improving service productivity and creating new revenue streams for customers.



Turbine to Remote Monitoring
GE turbines are monitored and analyzed 24x7 using 150+ unique software rules to detect, prioritize, and identify the best fix for wind turbine operation issues.

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Why GE?

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Our Approach

- Building a Silicon Valley presence
- Defining and developing Industrial Internet services
- Centers of Excellence: data science & design experience
- Stamping lean and agile best practices on global development hubs
- Creating leadership program

- New techniques & advances in analytics, esp. machine learning & statistics
- Hybrid cloud platform for services development & delivery
- Next-generation M2M & control technology
- GE user experience tool set
- Analytics centered applications

- Strategic partnerships for key infrastructure
- Strategic investment for innovative and emerging technologies
- Partner to pursue new markets
- Enable customers to create new solutions

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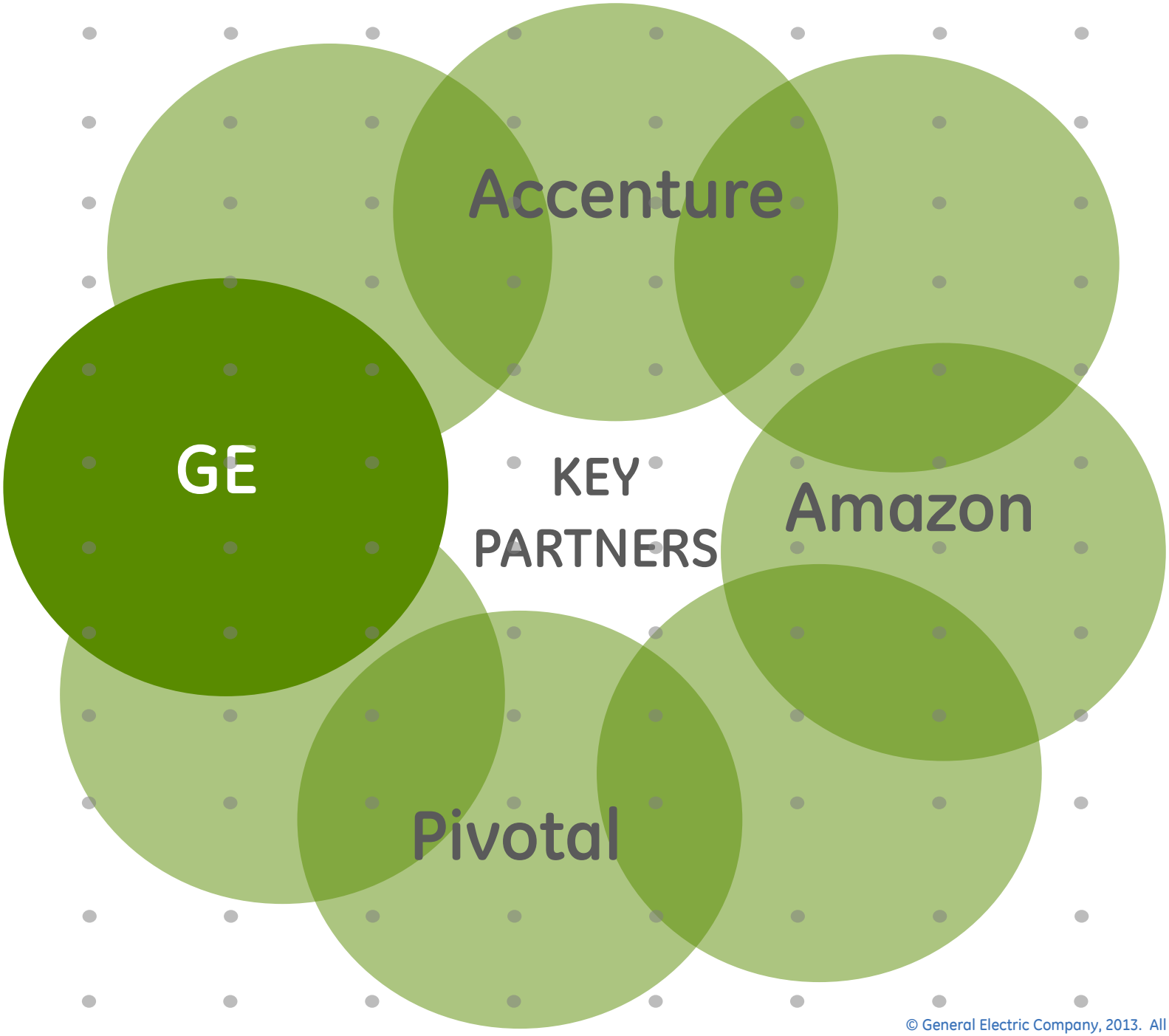

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What does this all mean?

- Disruption is occurring in every industry – Analog to Digital
- The benefits of intelligent systems are vast & the synergistic effects of widespread machine instrumentation can be realized across fleets & networks
- Software coupled with new processing architectures are the enabler for these digital industries
- R&D is critical to lead the change: not just new products but new solutions, systems & architectures

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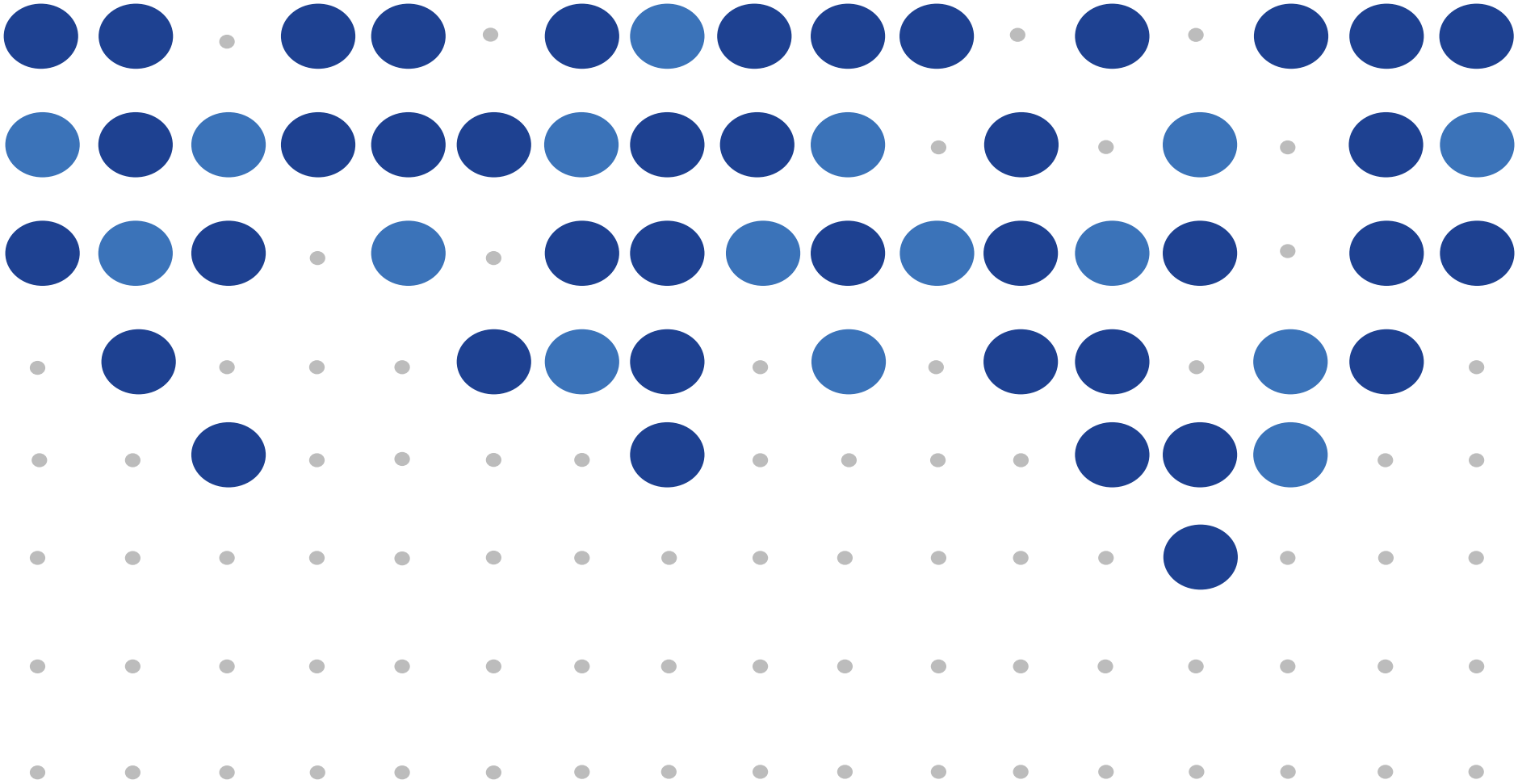

Thank you.

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GE imagination at work