



# Healthcare Digital Transformation

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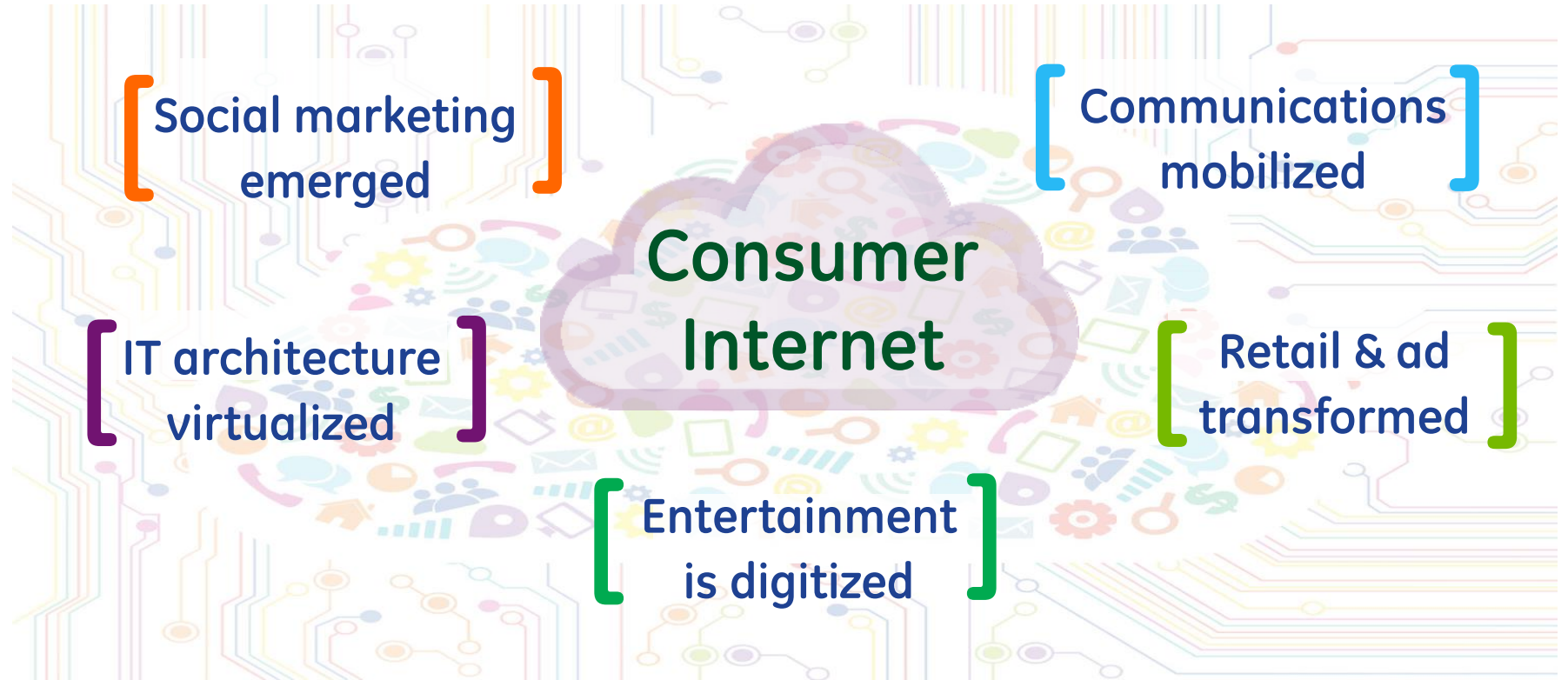


HUNGARIAN  
GOVERNMENT

NATIONAL RESEARCH,  
DEVELOPMENT AND  
INNOVATION FUND

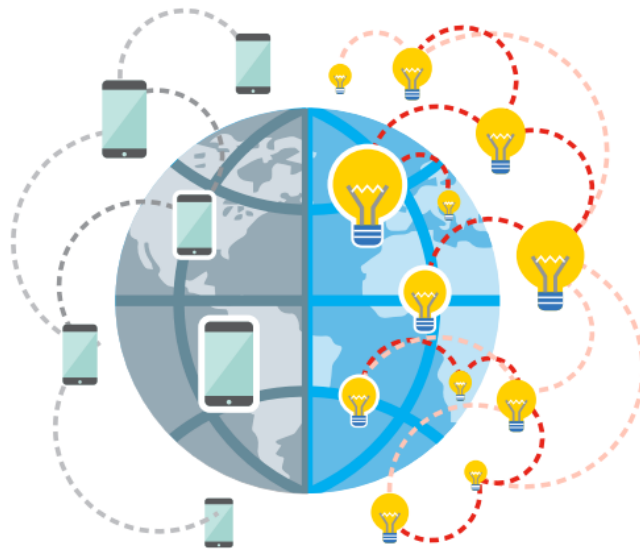
INVESTING IN YOUR FUTURE

# What happened when 1B people became connected?



# What happens when 50B machines become connected?

In 2015  
there were about  
**5 billion**  
**TOTAL**  
Internet-connected  
devices.



**While in 2020,**  
**50 billion**  
machines will be  
online.



# Digital industrial revolution is happening

## By 2020 . . .

Gas turbines  
connected

**10K**

Jet engines  
connected

**68K**

Light bulbs  
connected

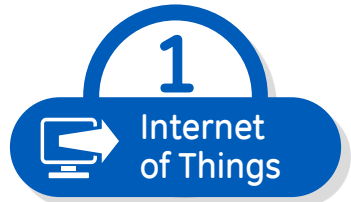
**100M**

Cars  
connected

**152M**



# A convergence of enabling technologies is setting the stage for industry transformation



“Hospital of Things” plethora of devices

Accelerating Bio-sensor market/use

Mobile healthcare explosion – \$27B by 2017<sup>1</sup>



Machines protecting and treating patients

Devices for new care givers and settings

Algorithms as updatable content



High volume of data from physiology monitoring

Care shift from population median to high-def individual



Forecasting and predicting future health

End of fee-for-service models drives data collect and analysis

<sup>1</sup> \$27B by 2017 for Mobile health services:

The market for mHealth services has now entered the commercialization phase and will reach \$26 billion globally by 2017 according to new “Global Mobile Health Market Report 2013-2017” by research2guidance. The report is one of the leading publications in the mHealth market. Companies that have purchased previous editions of the report includes: Agfa Healthcare, DTAG, Fresenius, Fujitsu, GE Healthcare, LG, Nokia, Novartis, Pfizer, Qualcomm, Roche, Roland Berger, Sanofi Aventis and many more.



# Forces Shaping Healthcare Delivery

## Healthcare delivery challenges from seismic shifts in the post-reform era

### 1. Rising Consumerism

Meet competitive and regulatory demands to measure and improve patient experience

Americans waiting in ER more hours than necessary

**1.1M**  
PATIENTS  
PER YEAR

American College of Emergency Physicians

### 2. Growth and Profitability

Address unprecedented productivity and growth imperatives, while improving profitability

Medicare/Medicaid underpayments to hospitals in 2013

**\$51B**

American Hospital Association

### 3. Expanding Care

Expand access to care with a shrinking labor force and resource constraints

75% total US health care spend towards the treatment of chronic diseases

**75%**  
TOTAL  
SPEND

Center for Medicare & Medicaid Services

### 4. Managing Risks

Assuming greater financial accountability for medical risk

Preventable adverse drug events in the US every year

**1.5M**  
PER YEAR

Institute of Medicine

### 5. Improving Outcomes

Value based reimbursement replacing fee-for-service model

One-third of US health care expenditures did not improve health outcomes

**\$700B**

Office of the Congressional Budget



# Challenges of Healthcare

Patient records not easily available when needed

Increasing cost and burden of managing data growth

Lack of systems' interoperability resulting in workflow inefficiencies

35%



of patient cases misdiagnosed, contributed by lack of collaboration and access<sup>1</sup>

153 exabytes



2013



2020<sup>2</sup>

50x

Healthcare data growth by 2020

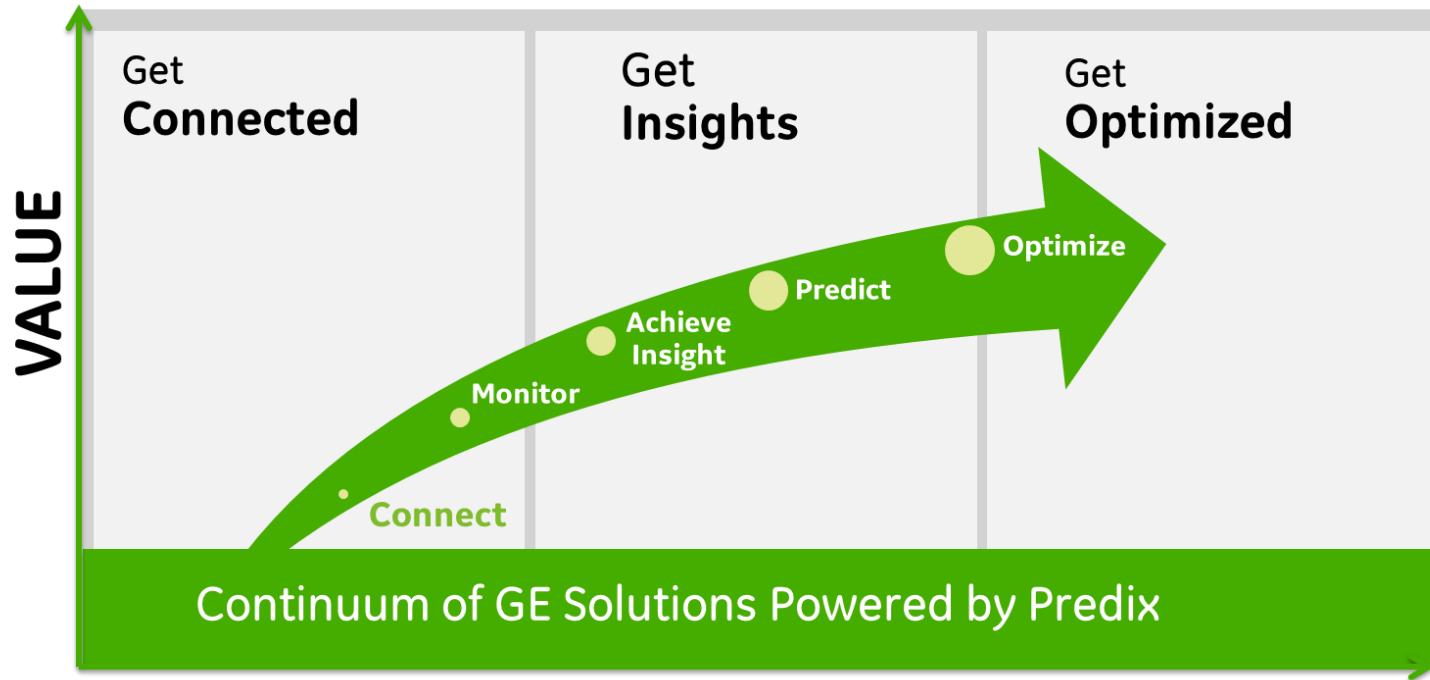


Interoperability of systems could save healthcare ecosystems



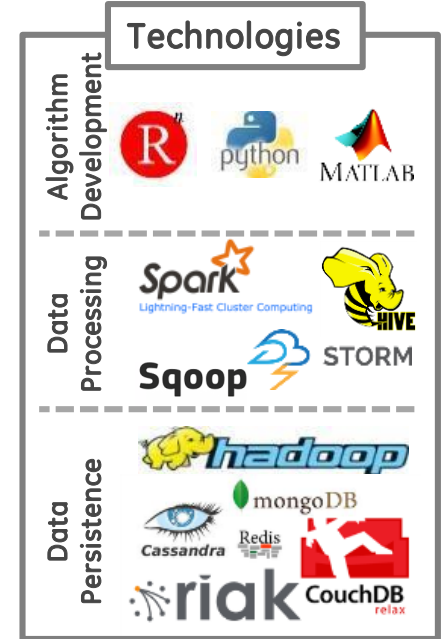
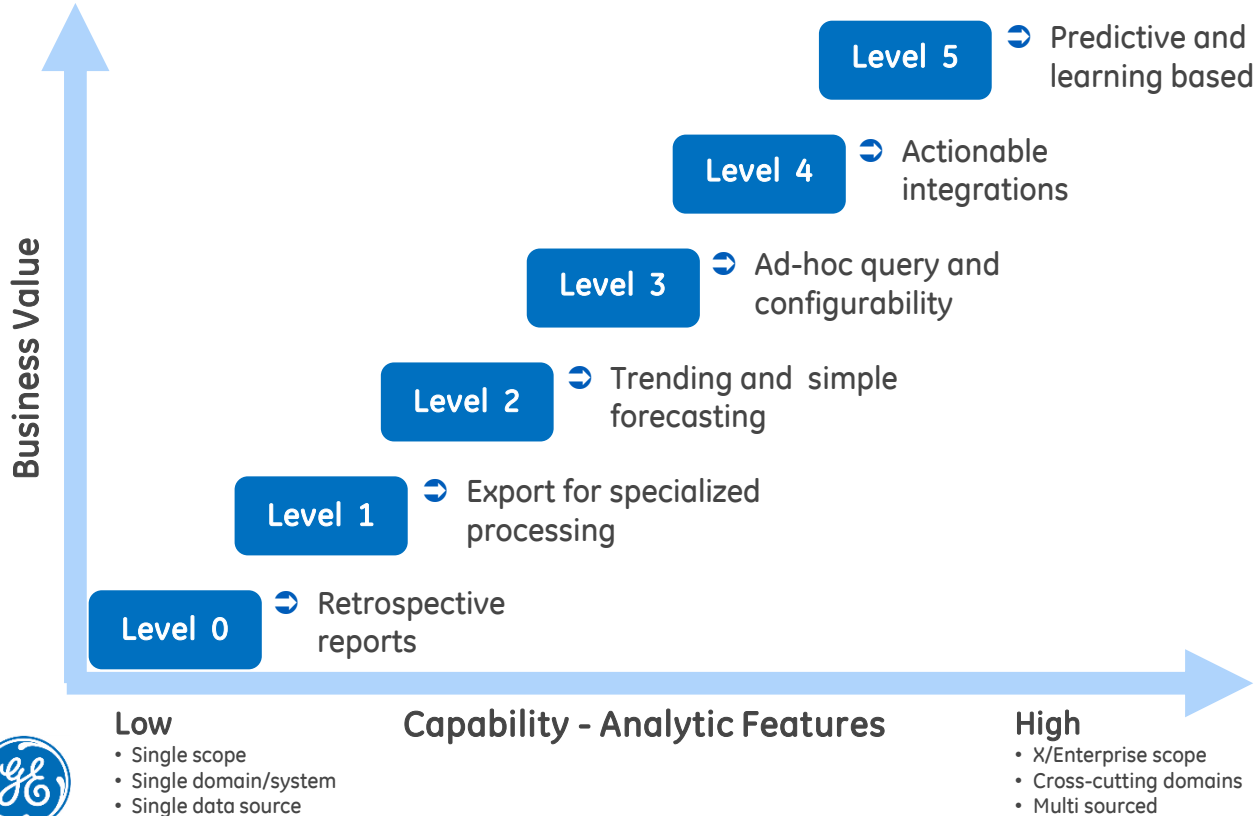
<sup>1</sup> "Types and Origins of Diagnostic Errors in Primary Care Settings," Journal of American Medicine, 2013  
<sup>2</sup> <http://www.cio.com/article/2375691/healthcare/healthcare-why-health-data-is-a-big-data-challenge.html>  
<sup>3</sup> <http://www.westhealth.org/sites/default/files/The-Value-of-Medical-Device-Interoperability.pdf>

# The Digital Industrial Platform

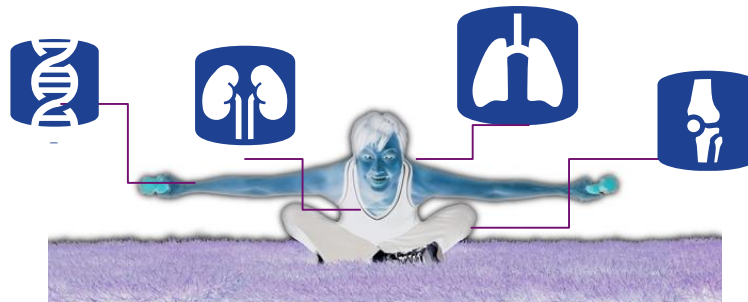
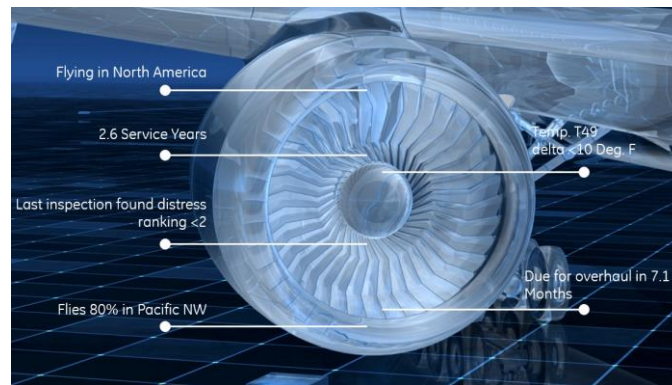


# Rise of Analytics

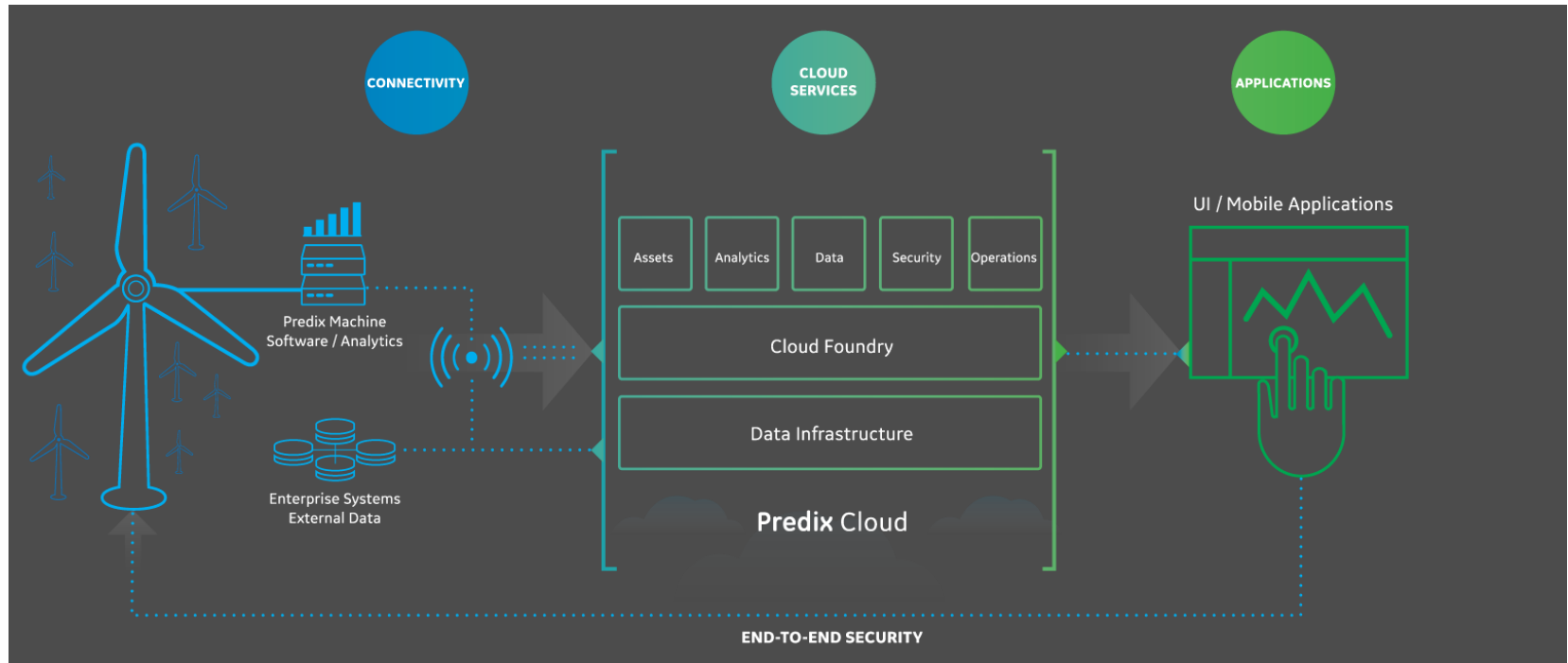
Higher order insights and new technology



# Digital Twins



# The Digital Industrial Platform



# Healthcare Digital Layer & Ecosystem Vision

Scalable, secure and connected ecosystem designed to deliver healthcare specific software functionality and applications 'as-a-service'

**On-Prem** connectivity and managed compute for data access and analytics at edge

**Cloud Apps** deliver new business use cases that can cut across care boundaries

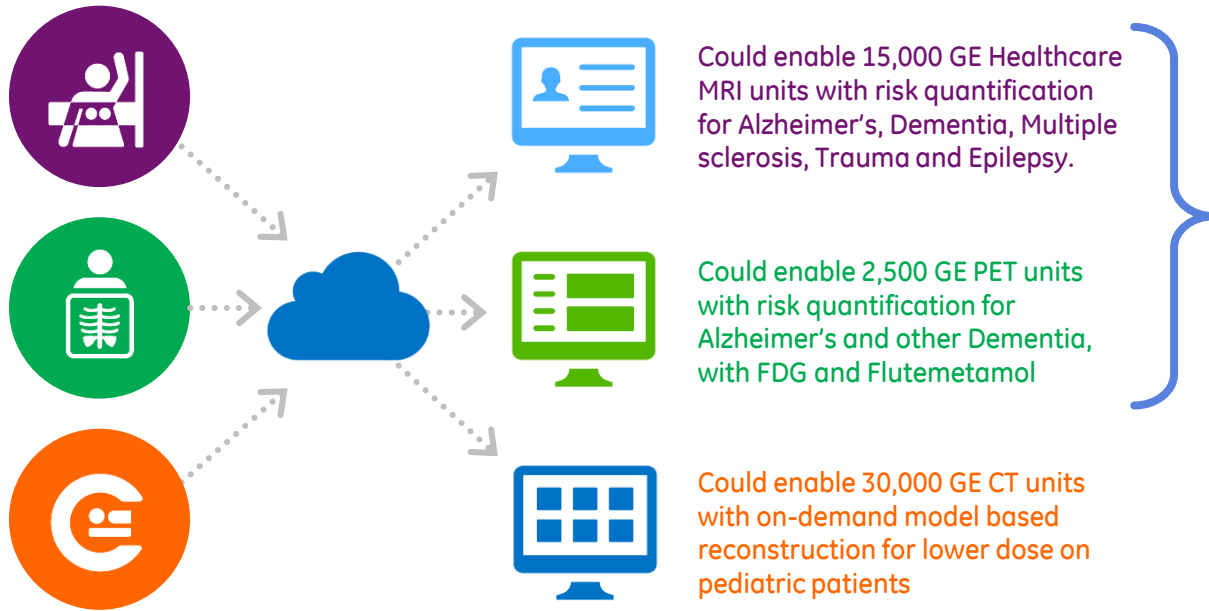
**Open ecosystem** fuels contributions and added value product adjacencies



Fuel business growth by addressing new digital opportunities and supplementing core business product lines



# Leveraging cloud elastic processing for ubiquitous access to reconstruction and latest clinical insights algorithms



  
From 5 million today to **13.8 M** Alzheimer's patients in the US by 2050<sup>1</sup>



<sup>1</sup> Alz. Org., 2015 ALZHEIMER'S DISEASE FACTS AND FIGURES, <http://www.alz.org/facts>  
Any descriptions of future functionality reflect current product direction, are for informational purposes only and do not constitute a commitment to provide specific functionality. Timing and availability are subject to change and applicable regulatory approvals./

# Take away messages

- Digital transformation is happening in every industry
- Cloud based storage, access and analysis provides potential benefits for healthcare
- Open ecosystem fuels collaboration

