

The **DIGITAL UNIVERSE**  
DRIVING DATA GROWTH in **HEALTHCARE**

CHALLENGES &  
OPPORTUNITIES  
FOR IT

EMC DIGITAL  
**UNIVERSE**

With Research  
& Analysis by



**GET STARTED**

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HEALTHCARE

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With Research & Analysis by IDC

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# Executive Summary: **Data Is Helping Drive a New Era in Healthcare**

## The Healthcare Digital Universe Is Big – and Growing Exponentially

Healthcare represents a significant percentage of the overall Digital Universe, and is growing at 48% per year – even faster than the rest of the Digital Universe

## Key Healthcare Trends Will Increase Growth of and Dependence on Data

New healthcare applications and regulatory/compliance challenges will drive data growth

Aging populations and physician shortages mean providers will need to be more efficient and do more with less

Higher patient expectations and continued introductions of new technology will drive significant growth in data

Data is growing quickly, but the value of data to quality, cost, and outcomes has never been higher

## The Coming Future Healthcare Model

Shift from one-to-one to “mass” model:

- Will require increased efficiencies
- More collaborative/self-care
- Focus on Population Health Management

Data will enable information-driven decisions and IT will be a key enabler

## Getting Ready: What You Need to Do Now

Improve and empower IT to scale workflows and applications

Adopt analytics technologies and data environments

Manage security/compliance more effectively

Adopt strong mobile strategies

Operationalize data backup/disaster recovery strategies

Deploy cloud for coordinated and team-based care

# The Digital Universe Is Huge — and Growing Exponentially

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**40%** ANNUAL  
GROWTH

4.4  
ZETTABYTES

44  
ZETTABYTES

2013

2020

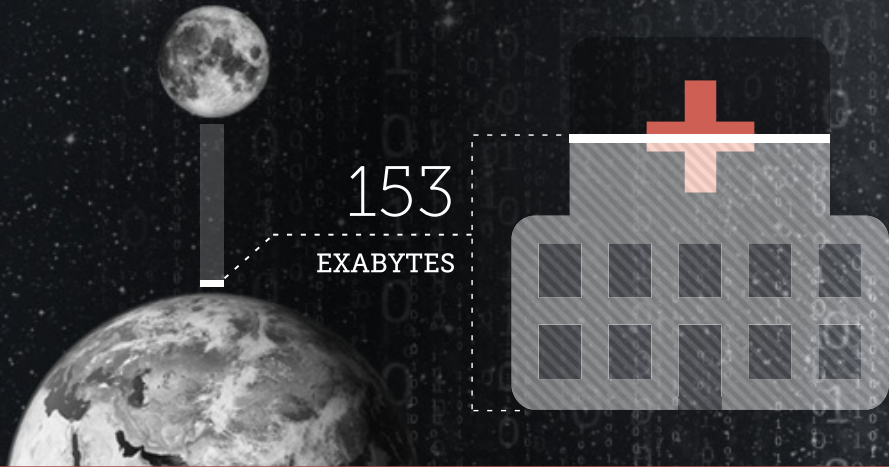
If all data on the planet in **2013** — the Digital Universe — were represented by memory in a stack of tablets, it would stretch **two-thirds** of the way to the Moon.\*

By **2020**, it would stretch **6.6 times** from the Earth to the Moon\*

Source: IDC, 2014  
\* iPad Air — 0.29" thick, 128 GB



# Healthcare Is One of the Fastest-Growing Segments of the Digital Universe



2013

If all data in the healthcare Digital Universe were loaded onto the memory in a stack of tablets...

it would be nearly **5,500 miles high**, reaching **3%** of the way to the Moon\*

EXAMPLE A

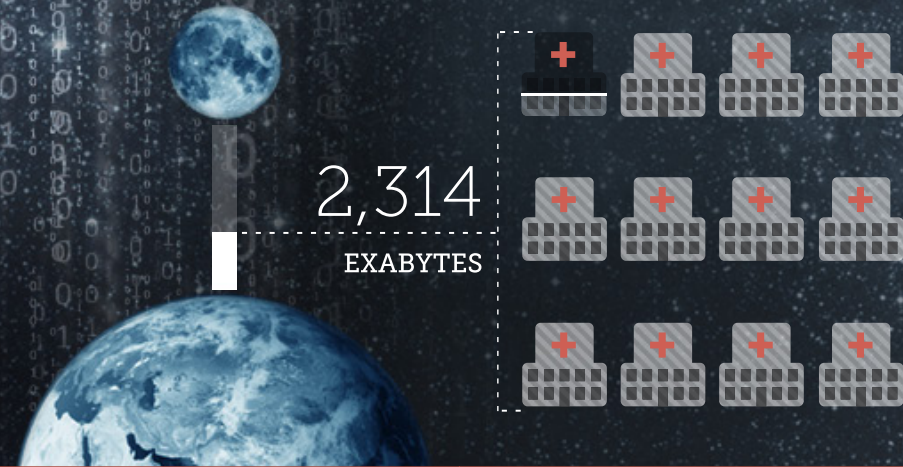
The loaded tablets would fill up **75%** of a large (1,000 bed) hospital\*

EXAMPLE B

**Healthcare** is one of the fastest-growing segments of the Digital Universe, growing at **48%** per year (compared to **40%** per year for the overall Digital Universe)

**48% ANNUAL GROWTH**

Source: IDC, 2014  
\* iPad Air - 0.29" thick, 128 GB



2020

By 2020, it would be...

over **82,000 miles high** and reach over **1/3** of the way to the Moon\*

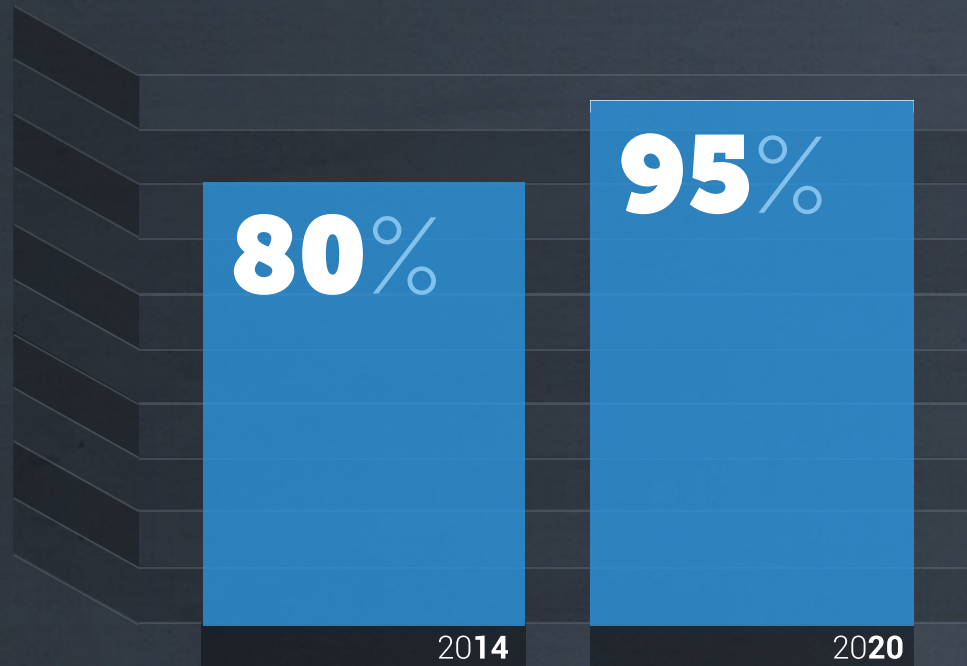
EXAMPLE A

The loaded tablets would fill that same hospital **11.3 times\***

EXAMPLE B

# Healthcare Applications Will Drive Data Growth

## HEALTH SYSTEMS WITH ELECTRONIC HEALTH RECORD (EHR) PENETRATION IN U.S.



- **EHR systems** are already in use in most U.S. hospitals
- **EHR replacement has already begun**, with 50% of health systems projected to be on second-generation technology by 2020
- **Diagnostic and other health applications** are also growing with increasing use of medical images and studies with larger image sizes
- **Adoption of clinical next generation sequencing (NGS) applications** will drive the re-evaluation of access, privacy, and data retention policies
- **Additional unstructured contextual** content such as video, audio, and text are being stored in medical records

# Regulatory Compliance Is a Key Data Growth Driver

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A patchwork of country and state regulations dictate how long healthcare providers must maintain patient data; many choose to maintain it *indefinitely*

**There's a high economic incentive to better manage the security and privacy of data**

**Healthcare providers have been charged hundreds of thousands or even millions of dollars for a single breach**

# The Compliance Challenge: **Gaining Control of Data** Across the **Health System**

## DATA DRIVERS IN A TYPICAL 500 BED HOSPITAL

### IT Controls:

- **500** Beds
- **8,000** Employees
- **400** Applications
- **500** Databases
- **1,000** Interfaces
- **10,000** Desktops
- **500** Owned/controlled Tablets
- **2,000** Owned/controlled Mobile Devices (provisioned)

**50+**  
PETABYTES OF  
DATA – AND  
**GROWING!**

### IT Does Not Control:

- Departmental applications and devices purchased without IT involvement or even knowledge
- **1,000** community physicians with their own tablets and smartphones
- **300,000** patients with their own devices
- Physician and employee-owned smartphones and tablets
- Other data
- Other applications

The sheer amount of systems and data outside of IT control can create a **“shadow IT”** compliance challenge

### CIOs options include:

- Do nothing
- Lock down all devices, including mobile
- Adopt control over all devices, but allow exceptions
- Embrace an enterprise mobile/BYOD data management strategy



# The Result Is **Too Much Healthcare Data Not Adequately Protected**

of the Healthcare Digital Universe **Does Not Need Protection**

7%

**93%**

of Healthcare Digital Universe **Needs Protection**

**EXAMPLES:**

- Medical records
- Claims histories
- Patient protected health information (PHI)

**57%**

Is **Somewhat Protected**

**43%**

Is **Not Adequately Protected**

HEALTHCARE  
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UNIVERSE

Consequences of unplanned **downtime, data loss, and breaches** include:

Financial penalties

Breach of patients' trust

Cost of remediation

Public relations consequences

Source: IDC, 2014

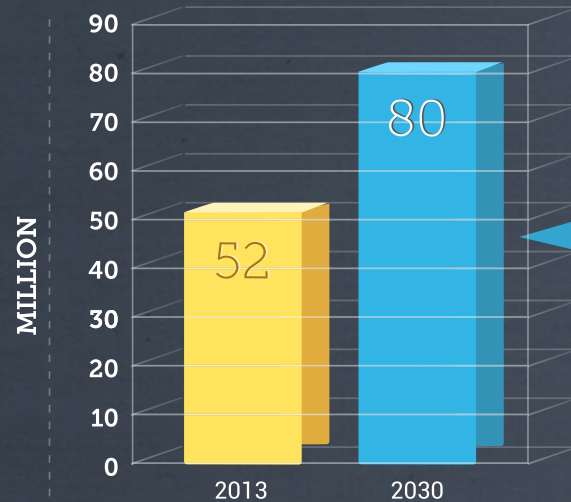
# Aging Population with Chronic Conditions Will Increase Demand for Healthcare Services

- Aging and population growth are expected to account for **81%** of growth in healthcare demand between **2010** and **2020**
- Older, sicker patients have more chronic conditions, increasing the cost of delivering healthcare
- These trends are consistent around the world

Data sources: U.S. Census Department, <http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/ReportsTrustFunds/downloads/tr2014.pdf>

The number of older healthcare recipients will grow...

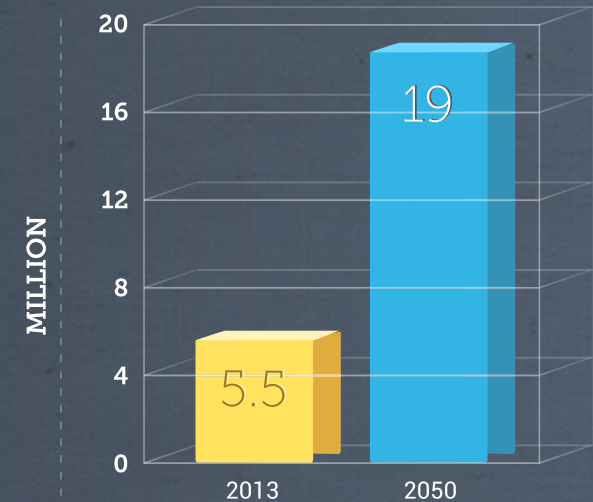
U.S. MEDICARE BENEFICIARIES



Will represent **20%** of the U.S. population

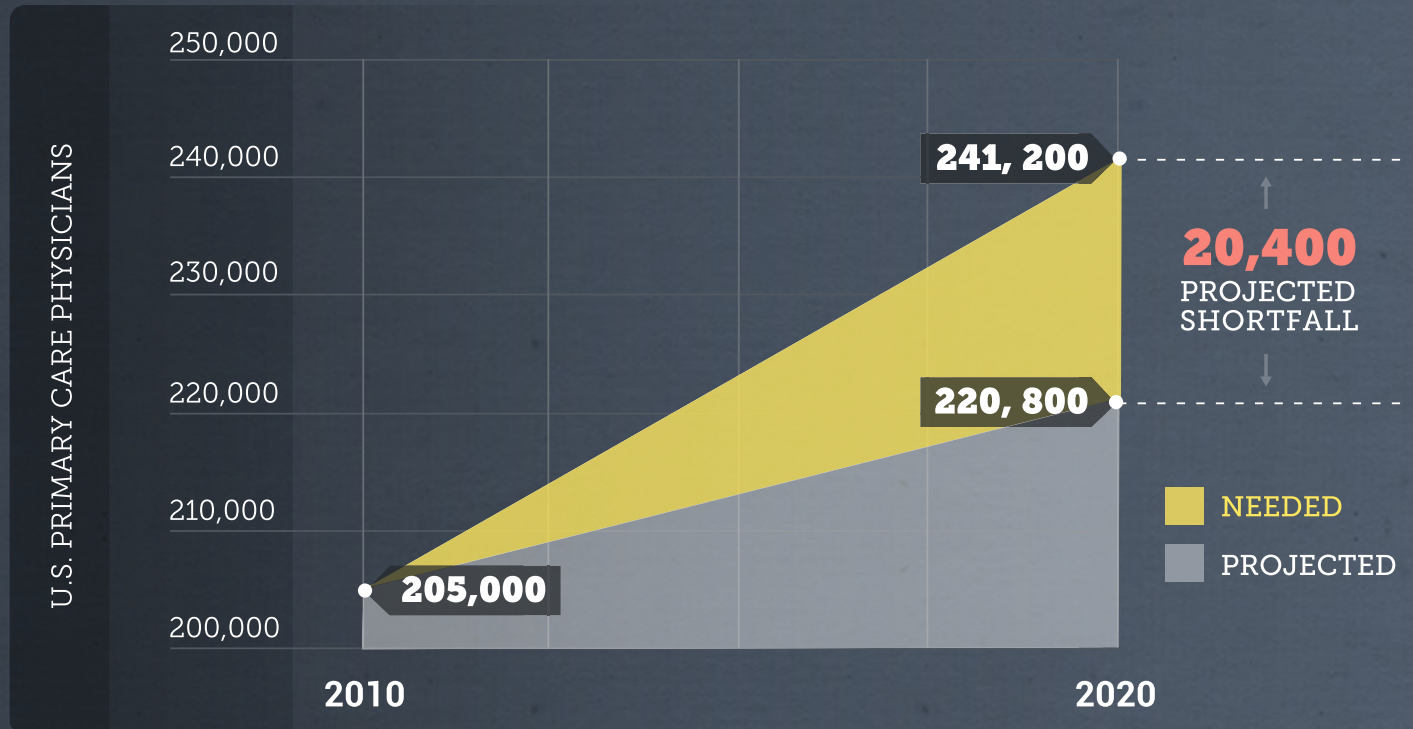
...and they will get even older

U.S. POPULATION OVER AGE 85



# Shortage in Primary Care Physicians Will Increase Need for Provider Efficiency

- Number of full-time primary care physicians in U.S. is projected to increase by **8% from 2010 to 2020**
- Demand for primary care physicians will grow by **14%, resulting in a 20,400 physician shortfall**
- This will force healthcare providers to be more efficient and do **more with less**
- Providers must increase deployment of IT to help scale

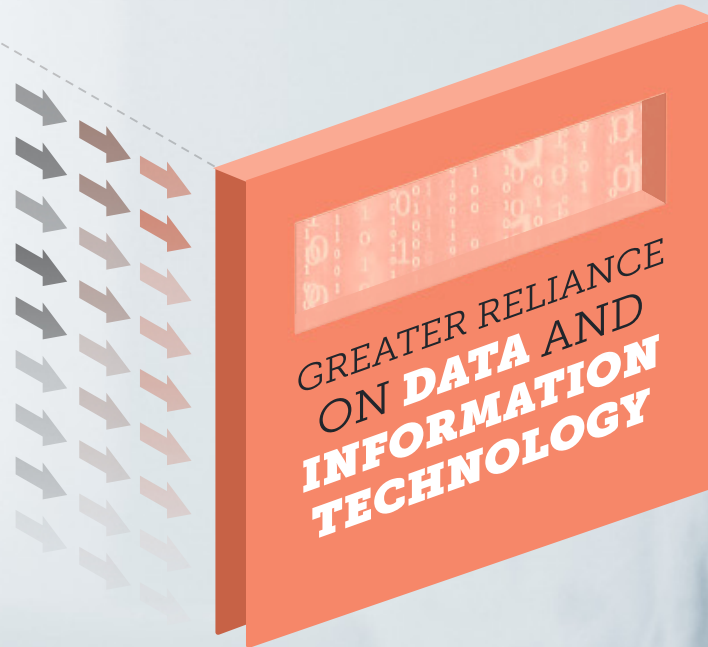


# But **Patient Expectations** Will Continue to Increase

**Patient expectations will increase** for treatment options and speed of delivery – such as mobile monitoring, remote diagnostics, aging in place, and patient-centered medical home

**Personalized medicine** will continue to drive demand for cutting edge research and technologies such as advanced medical imaging, digital pathology, and genomics

**Increased use of personalized medicine adds further to the growth of the digital universe**



# Connected Devices Will Contribute an Increasing Amount to the Healthcare Digital Universe

**Connected  
(non-computer)  
devices** are  
generating an  
increasing  
amount of data

**EXAMPLES INCLUDE:**

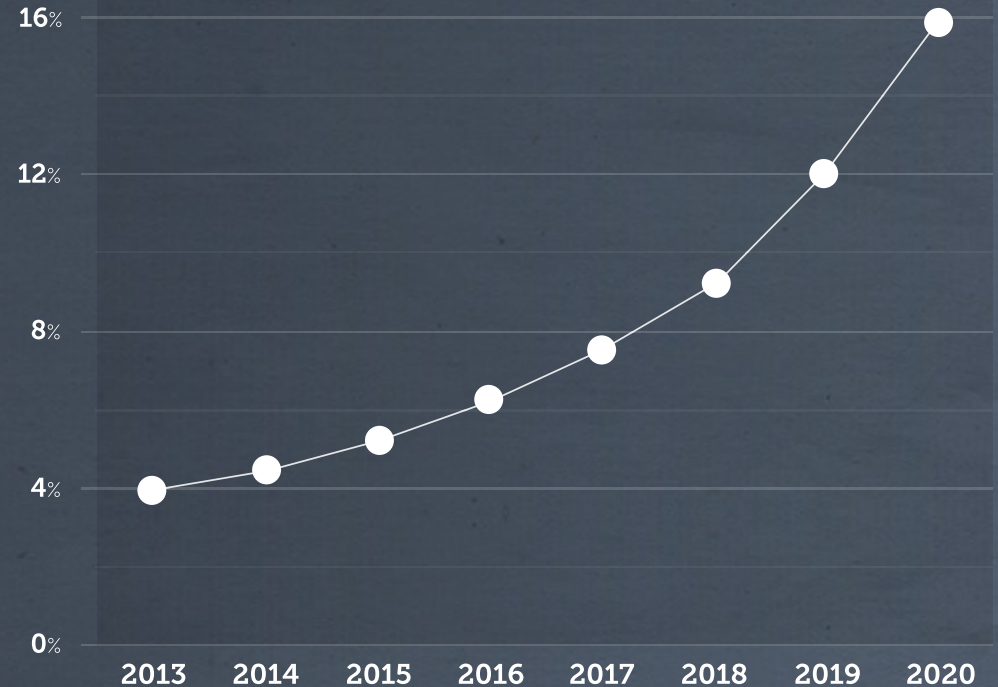
Patient monitors	RFID readers
Drug delivery systems	Tracking devices and sensors for physiological measurements
In-room monitors and controls (e.g. smart beds)	Video cameras

These connected devices are considered part of "The Internet of Things"

**EMBEDDED SYSTEMS**

AS % OF **HEALTHCARE DIGITAL UNIVERSE**

Source: IDC, 2014



# Need to Target High-Value Data to Improve Patient Care Quality

The amount of data in the healthcare Digital Universe can be daunting

The challenge of data growth and complexity is finding the right data at the right time

But with Big Data/analytics, healthcare providers can focus in on data most useful for diagnosis, treatment, and discovery

**At 3.1%, highest-value target-rich data is a much more manageable area of discovery**

More effective data analytics will improve care outcomes, population health, readmissions – and ultimately, help lower patient care costs

**57%**

of all healthcare data is useful if **tagged and analyzed** (e.g. for diagnoses, research, or analysis)

**3.1%**

of healthcare data provides the **highest value**: the challenge is identifying this needle in the haystack

Source: IDC, 2014

# Future Vision: The Industrialization of Healthcare

**TODAY'S MODEL:  
FEE FOR SERVICE**

**1:1** FEE-FOR-SERVICE  
**MEDICINE**



WILL BE REPLACED BY...



**NEW, SCALABLE  
"INDUSTRIALIZED"  
MODEL : FEE FOR  
PERFORMANCE**

- Collaborative care teams
- Region-wide economies of scale
- Results-driven payment
- Value-based medicine
- Telehealth
- Population health

Better use of data will enable information-driven decisions at lower costs

- These will improve drug discovery, diagnostics, population management, and business intelligence
- They will drive better outcomes, prevention, and lower readmissions

IT will be a critical enabler of future success, and will require an increased level of agility, flexibility, and scale

Critical data technologies will include:

- Hybrid cloud to allow better sharing and collaboration across continuum of care
- Data lakes to allow at-scale storage and data interpretation
- Enterprise-level protection and security

# What **Hospitals** Should Do **Today** to Prepare for the **Coming Trends**

Evolving to the new model will have its share of challenges. To better prepare themselves for the coming transition, healthcare providers should:

**Empower IT to more quickly provision new applications, linking to emerging technologies for cloud, big data and analytics, mobile, and social**

**Implement unstructured content repositories/VNAs to better support delivery with longitudinal care records**

**Adopt cloud to improve performance, workflows, and processes for coordinated and team-based care**

**Adopt analytics technology for performance improvement, care quality, and operational efficiency**

**Adopt strong mobile device and data management strategies for owned and third-party devices and apps**

**Test and operationalize compliance, data backup, and disaster recovery strategies**