

Cloud Computing and Health Care Facing the Future

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Objectives

- Describe what cloud computing is and what cloud computing is not
- Separate fact from fiction when talking about “the cloud”
- Discuss the advantages and disadvantages of cloud computing
- Identify who’s using cloud computing and why
- Discuss why cloud computing is a good idea for healthcare

Myths about “the cloud”

- It's just a fad
- It's only remote storage
- It's just centralized computing
- It's only for consumers and small businesses
- It's just another word for computing over the internet

NIST Definition of Cloud Computing

Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

This cloud model promotes availability and is composed of five essential **characteristics**, three **service models**, and four **deployment models**



Essential Characteristics

Measured Service

Rapid Elasticity

On-Demand
Self Service

Broad Network
Access

Resource Pooling

Service Models

Software as a
Service (SaaS)

Platform as a
Service (PaaS)

Infrastructure as a
Service (IaaS)

Deployment Models

Public

Private

Hybrid

Community

intuit.

Intuit QuickBase: Online Sharable Database

Google™ Docs



SaaS = Front End

Back End



Software-as-a-Service (SaaS)

- The face of “the cloud”
- A model of software deployment
- Hosted by a service provider
- Evolution of the ASP model
- Pricing typically based on usage

Model	Traditional	SaaS
Deployment	Installed	Hosted
Location	On premise (internalized) Centralized	In “the cloud” (externalized) Decentralized
Pricing	Large up front cost + maintenance	Small or no up front cost + pay as you go
Development	Longer cycle	Short, continuous cycle
Updates	Large, infrequent	Smaller, frequent

Potential advantages of SaaS

- Lower cost
 - Software infrastructure
 - Third party tools
 - Hardware
 - Re-implementation / Replacement
 - Labor

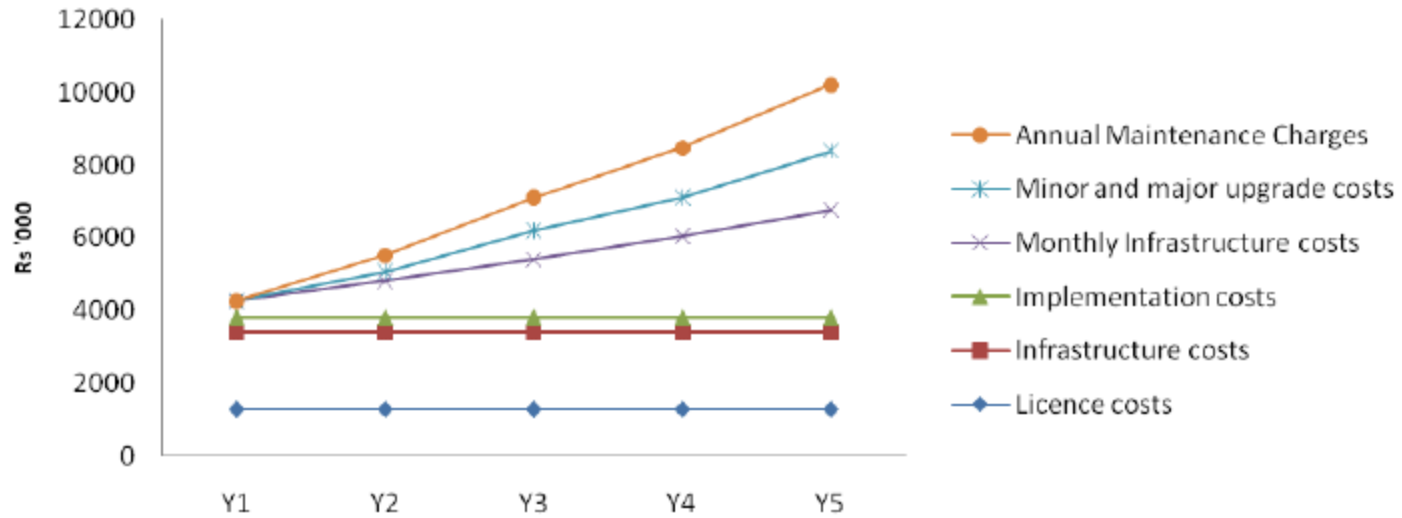
Cost of resources

- 75% of IT budgets are spent maintaining and running existing systems
- The initial purchase cost of software is only 5% of the TCO
- Hidden personnel costs can be as high as 70% the cost of on-premise software
- IT labor costs can be 18 times that of equipment cost

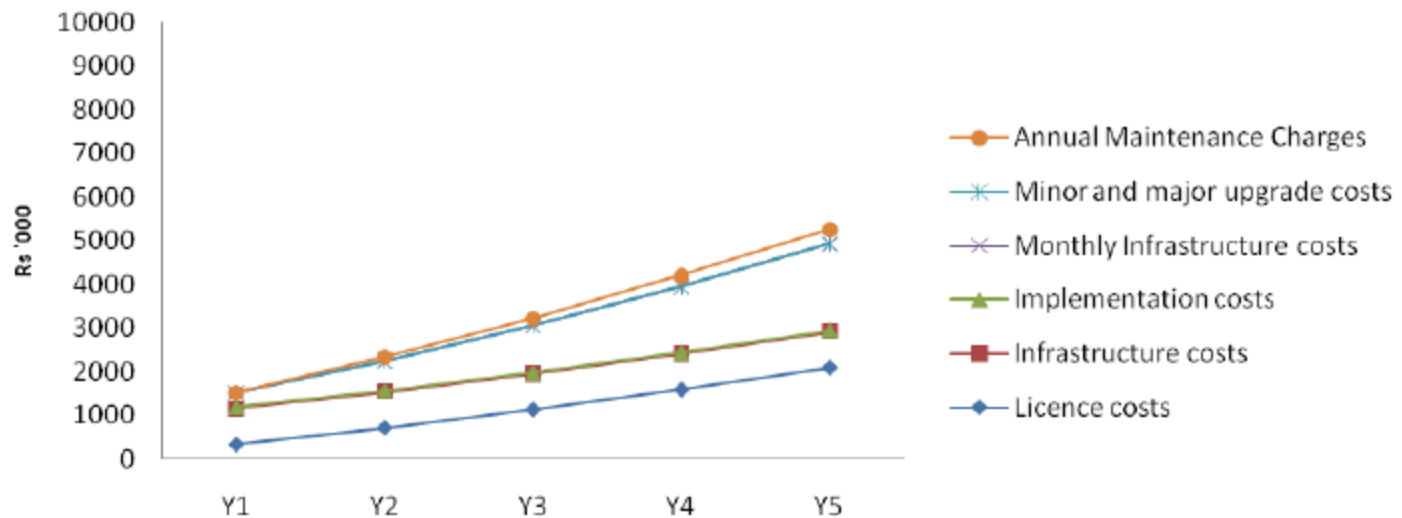
Cost – Cloud vs. Traditional Model

Costs/Economic Metrics	Status Quo: 1,000 Server (Non-Virtualized) Environment	Scenario 1: Public Cloud	Scenario 2: Hybrid Cloud	Scenario 3: Private Cloud
Investment Phase Costs FY10–12 (BY09 M\$)	\$0	\$3.0	\$6.1	\$7.0
O&S Phase Costs FY10–22 (BY09 M\$)	\$77.3	\$22.5	\$28.9	\$31.1
Total LCCs (BY09 M\$)	\$77.3	\$25.5	\$35.0	\$38.1
Economic Metrics:				
NPV (BY09 M\$)	N/A	\$41.8	\$33.7	\$31.1
BCR	N/A	15.4	6.8	5.7
DPP (Years)	N/A	2.7	3.5	3.7


Cost Build Up - Traditional Applications



CostBuildup - SaaS Applications



Other advantages of SaaS

- Decreased resources for IT operations and support
 - Lower risk
 - Increased flexibility and scalability
 - Superior operations
 - Practical
- 

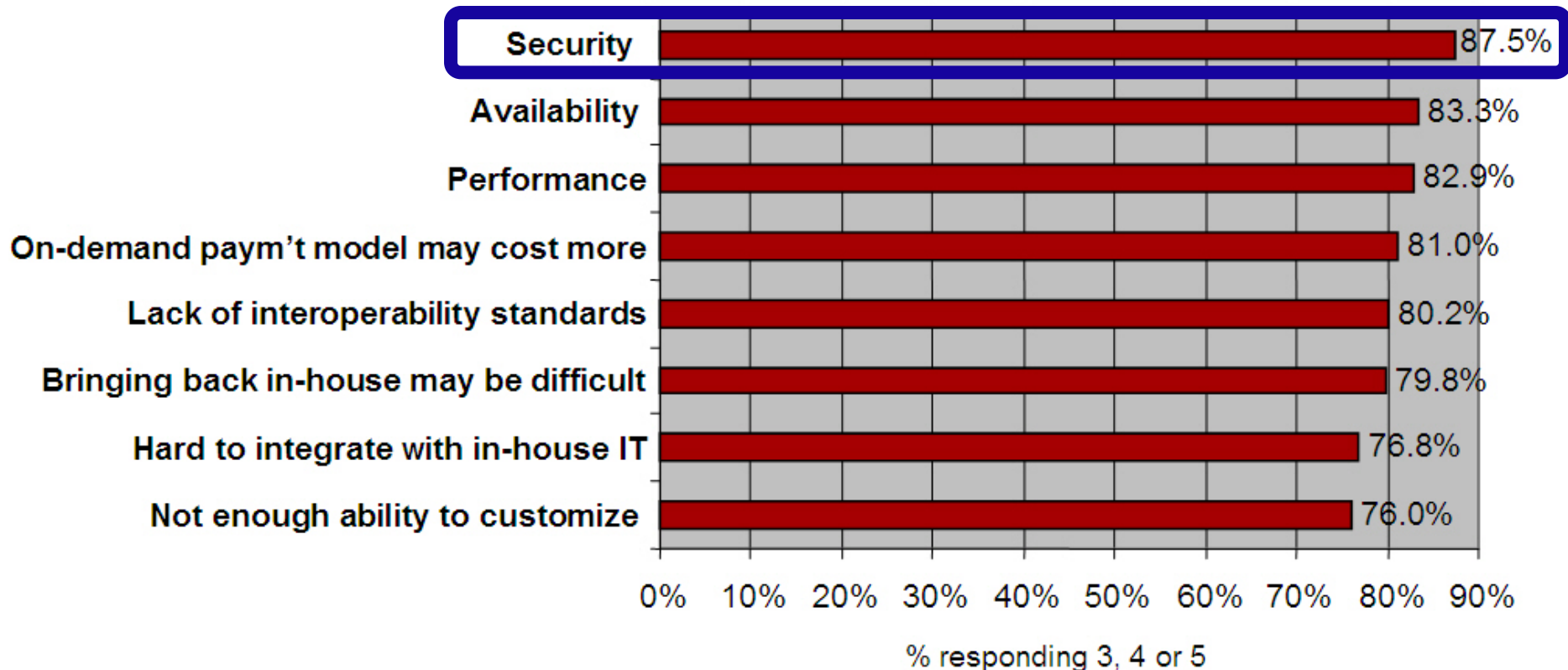
Serendipitous advantages

- Facilitate information exchange
- Track chronic medical conditions across providers
- Make aggregate data available for study
- Eliminate transcription in favor of direct access
- Reduced need to “pull a chart”
- Reduce duplicate diagnostic tests

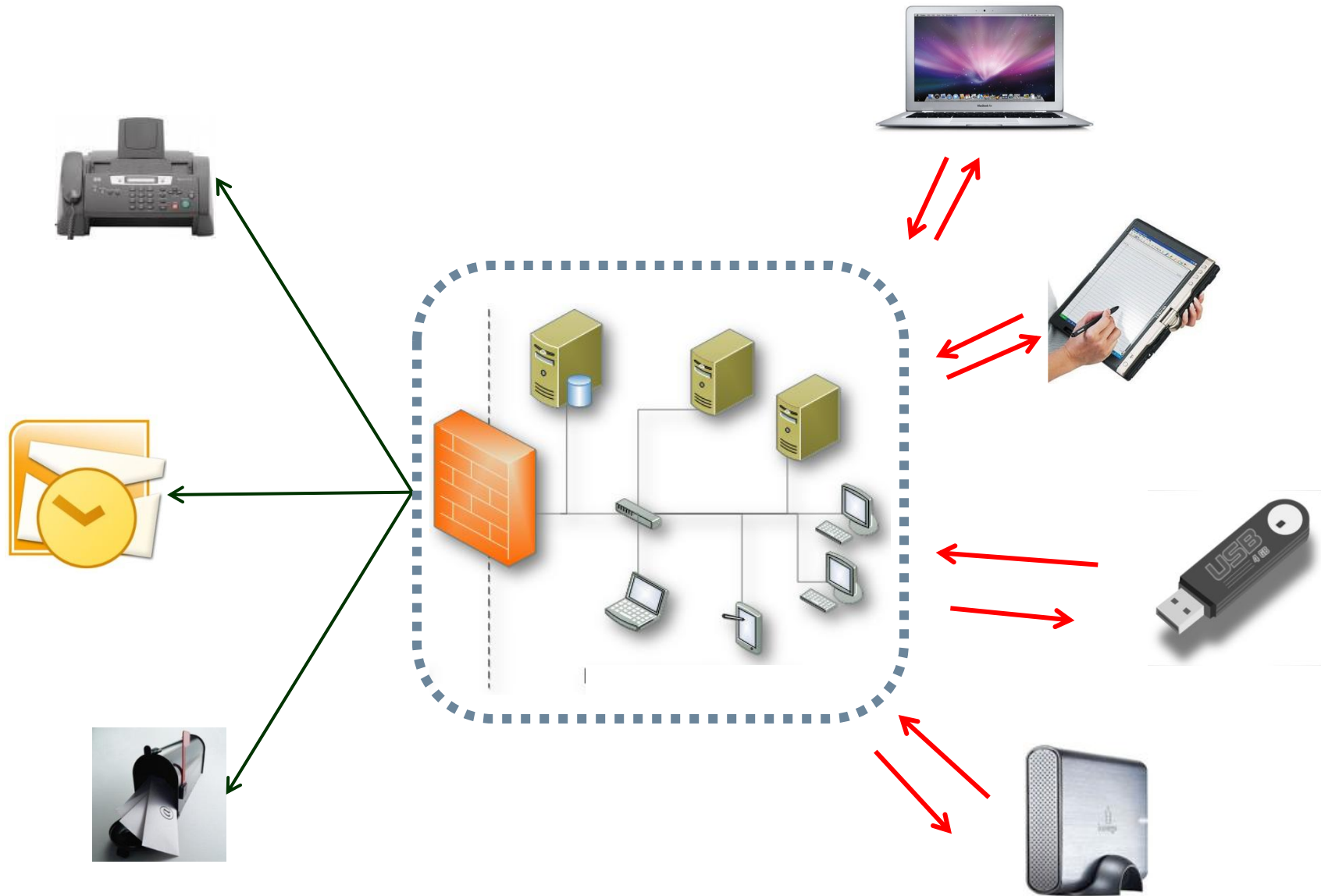
Concerns: SaaS and the cloud

Q: Rate the *challenges/issues* of the 'cloud'/on-demand model

(Scale: 1 = Not at all concerned 5 = Very concerned)







Illusion of data security

Security and mobility – Laptops



- 10,000 laptops lost in airports each week
- Average cost of a lost or stolen laptop is \$49,246
- For a healthcare laptop the average is \$67,873

Trulife
7,000

MARA
29,800

Cardiolog
Consultants Inc
8,000

Shands
Healthcare
12,500



Aurora Medical
Ctr 6,400

Halifax Health
33,000

Cloud / SaaS Computing Model

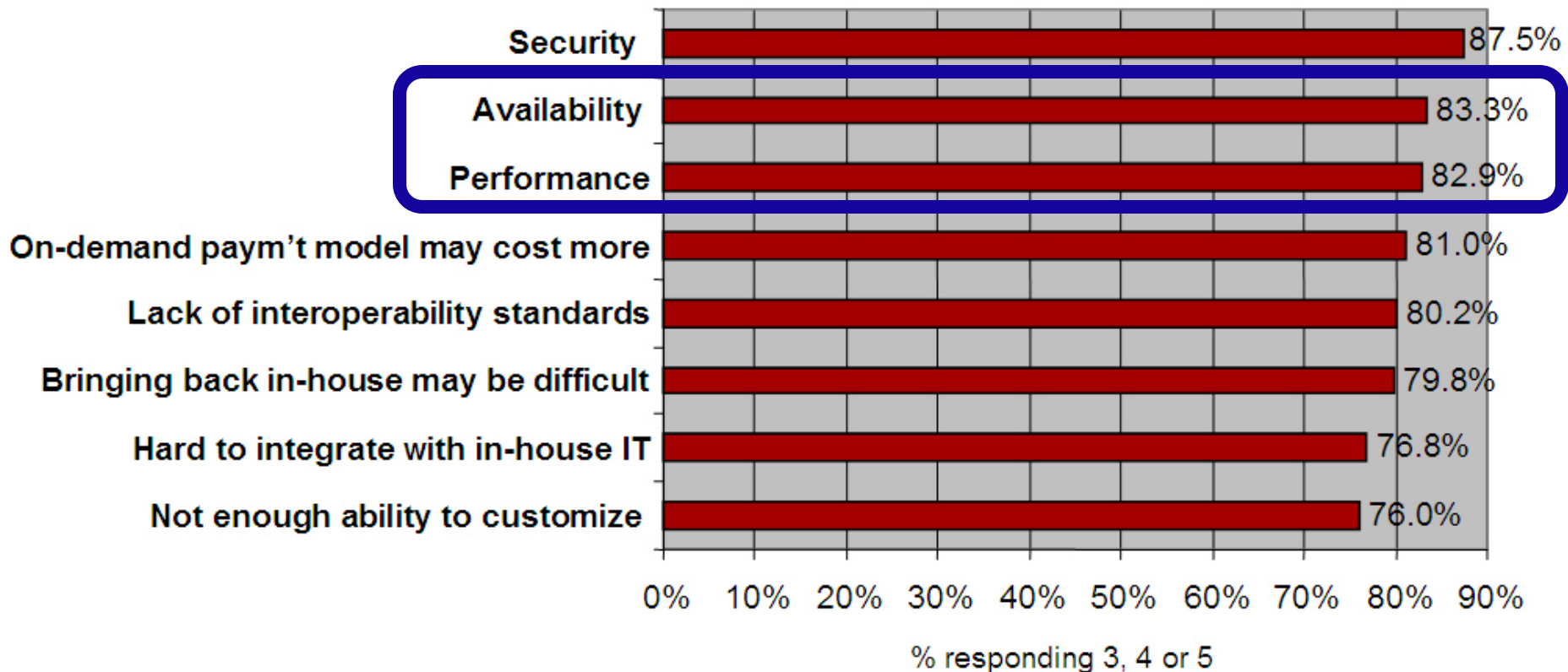


“The scale and flexibility of cloud computing gives the providers a security edge”

Concerns: SaaS and the cloud

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	Rackspace	Amazon
Uptime	100%	99.95%
Timespan	Current period	“service year”
Time-to-resolve	1 hour	Not specified
Availability	99.9%	99.9%

....why should we care?



Work. Online



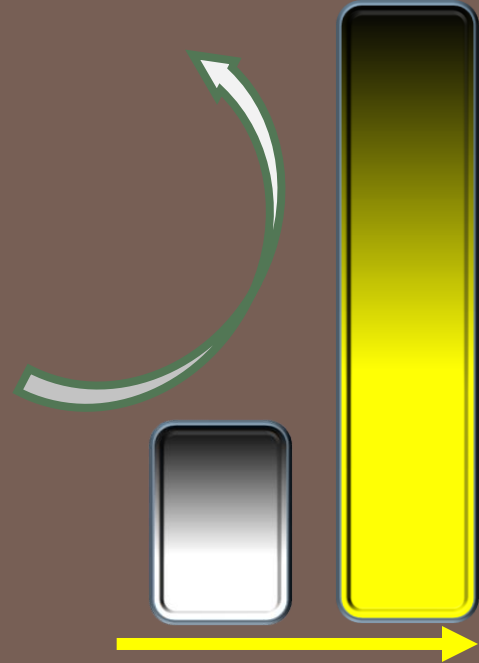
“..about 70 percent of our folks are doing things that are entirely cloud-based, or cloud inspired. And by a year from now that will be 90 percent.”

“In three years time, desktops will be irrelevant.”

“The implication that has not been expressed here or in the industry is Mobile First – the principal of everything being developed for mobile first.”

Expected Growth of SaaS

- 21% of enterprises are piloting or using SaaS
- Another 26% are interested or considering it
- 17% growth for “the cloud”/SaaS vs. 4.8% for on-premise for 2010
- China’s SaaS industry is expected to exceed its traditional IT industry



Popularity of SaaS / “the cloud” in healthcare

- Fujitsu tsClinical
- Humedica
- Google Health
- Microsoft Healthvault
- SharEHR
- Pharmacy OneSource
- IBM Infosphere
- Oracle Clinical Development Analytics
- Practice Fusion EHR



Beth Israel Deaconess (BID)

- Large scale migration to EHR.
- EHR and practice management system from eClinicalWorks to approximately 175 practices
- Access via PC with thin-client connector that provides encryption, authentication and connectivity to the cloud
- Additional software and hardware upgrades approximately \$20,000 in virtualized model vs. \$325,000 for traditional model
- Using virtual servers saved BID \$300,000

"We could have gone with a classic environment - server clusters and building arrays for storage; the problem was that we'd have to build it for the largest load we'd ever need and we had no guarantee anyone would use it."

Microsoft and Cleveland Clinic

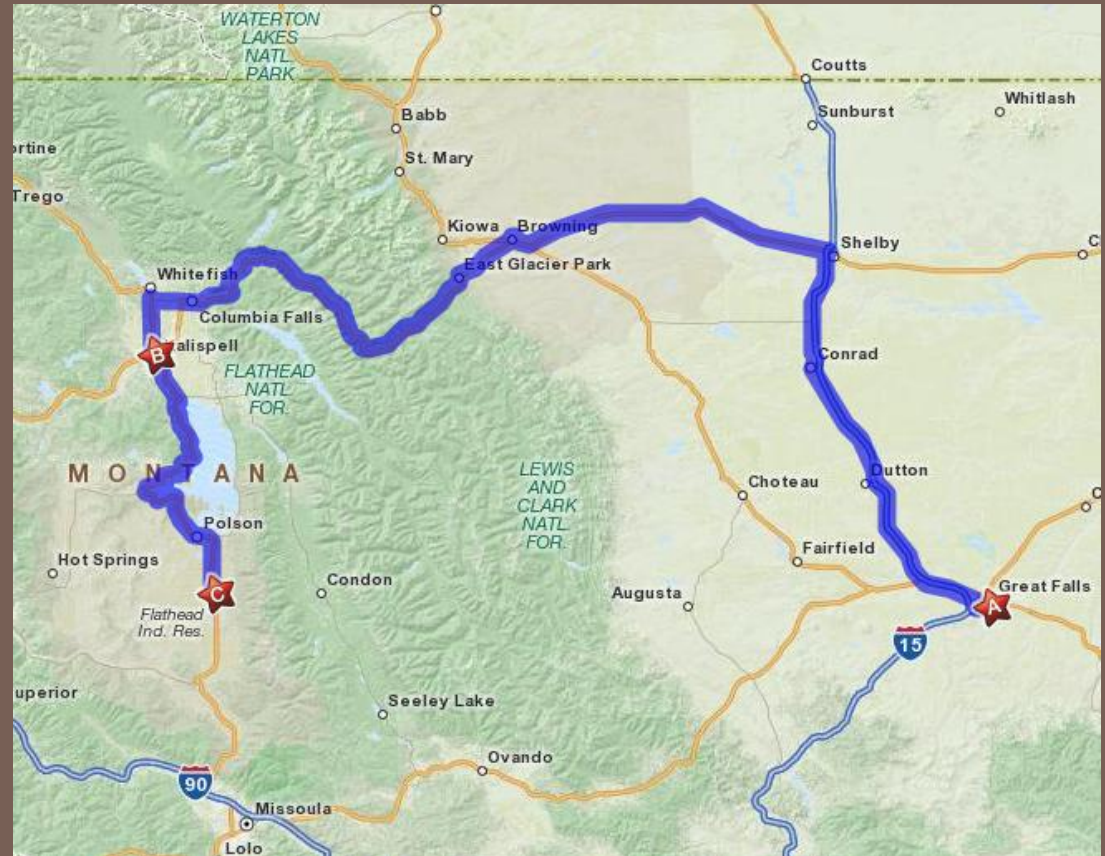
- HealthVault Community Connect
- Pilot for 250 patients
- Chronic disease management
- Data collected and routed to hospital system (Epic) via HealthVault
- Physician review/monitor patient data
- Positive benefits



“The ability to monitor weight, blood pressure and activity levels of heart failure patients on a regular basis ensures more timely doctor visits and avoidance of more expensive interventions.”

Image Movement of Montana (IMOM)

- 3 IMOM hospitals
- Image sharing (PACS)
- eMix from DR Systems
- Cloud-based storage
- Email notification
- Real-time access
- Patient access



“Smaller practices and health information exchanges are often using applications that are based in a cloud computing model, or software-as-a-service model. Large hospitals...are increasingly looking to provide a repository for the massive amounts of data that they need to store and access, on an as-needed basis—more of a utility service.”

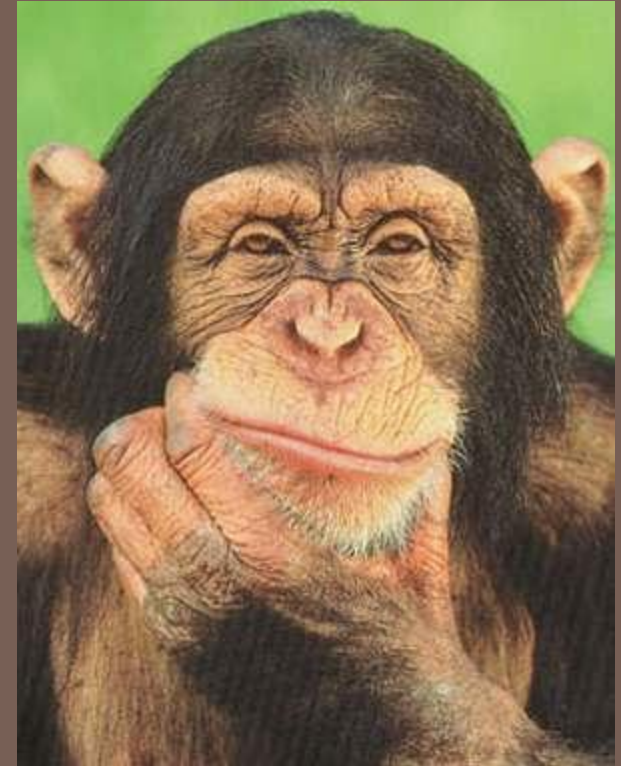
Reasons for the paradigm shift

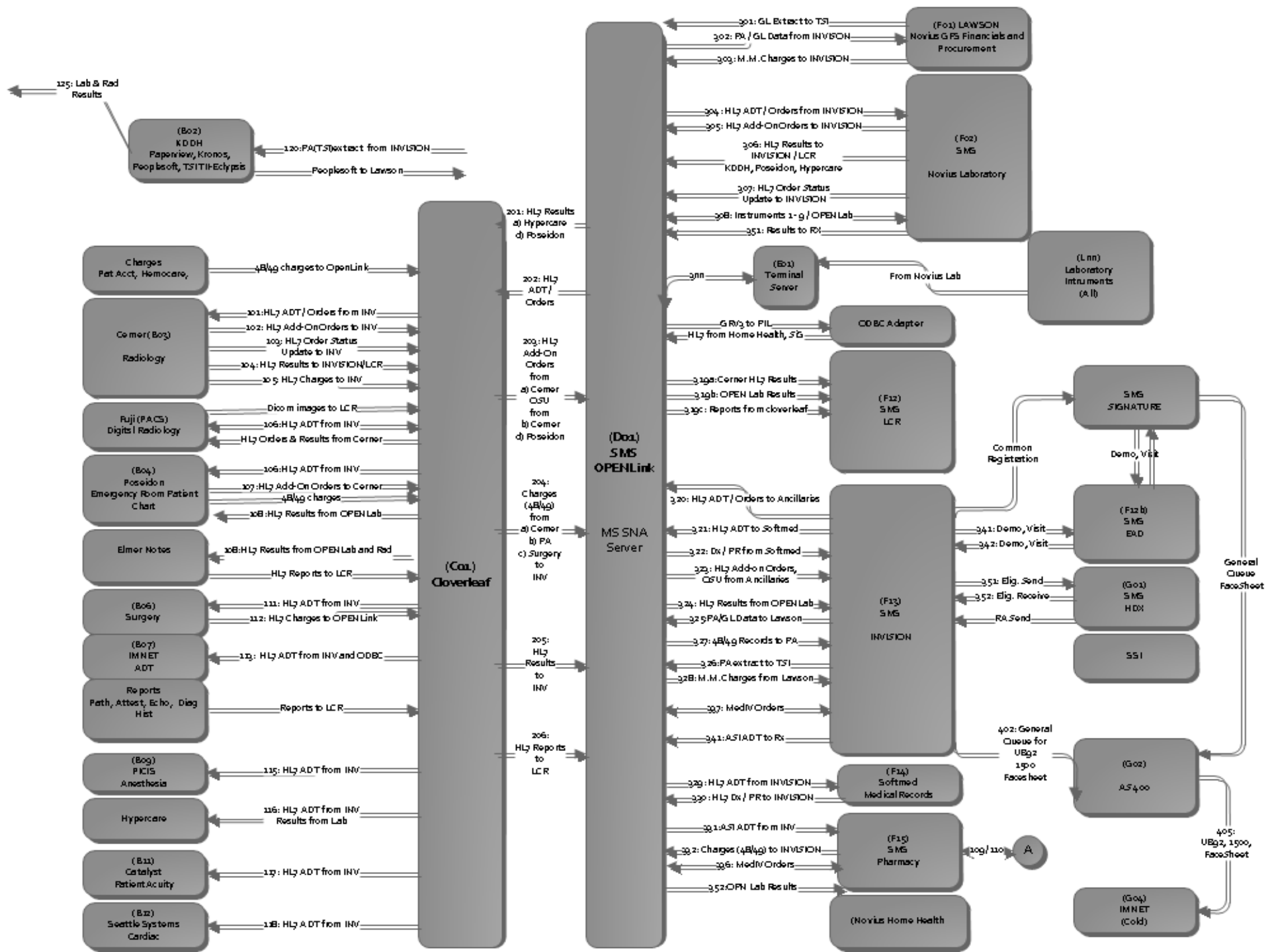
- The economy
- IT Departments
- Faster Internet
- Mobility
- Expanded platforms
- Viable platform for HIT
- Platform for clinics and small medical practices to meet needs
- We need these new technologies in healthcare



Final thoughts: what can “the cloud” ultimately do for me?

- Handle eHealth data
- Improved patient care
- Provide complete, accurate, and searchable health information
- Make information available at the point of care
- Remove the wait associated with the exchange information
- Provide earlier diagnosis and characterization of disease
- Reduce adverse drug events, drug-drug interactions, duplicate tests





Questions?

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