



*The only way to make sense out of change is to plunge into it, move with it, and join the dance. ~ Alan W. Watts*

Alan Wilson Watts (6 January 1915 – 16 November 1973) was a British philosopher, writer, and speaker.

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 **How Did “This” All Start?**

Basics



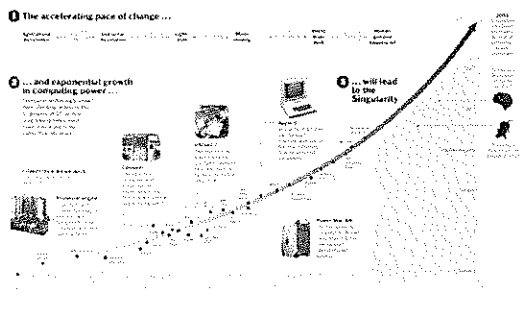
© The Children's Mercy Hospital 2015

**Moore's Law**

1 The accelerating pace of change ...

2 ... and exponential growth in computing power ...

3 ... will lead to the Singularity



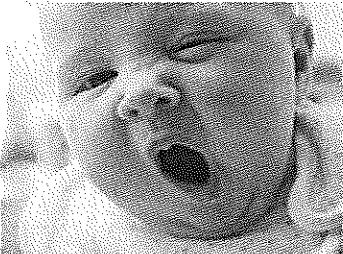
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- **Gordon Moore**, Intel cofounder
- 1965 noted transistors were shrinking
- 1975 capacity of transistors fitting on chips doubles every two years
- 2016 transistors have features 10 nanometers
- Next... machine learning “deep learning” and reconfigurable chips for AI

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- **Buckminster Fuller**, 20<sup>th</sup> century inventor dedicated to making the world work for all humanity
- Created the Knowledge Doubling Curve
- Amount of knowledge doubled every century up to ~1900
- End of WWII every 25 years
- 2017 every 13 months
- IBM say IOT will make it every 12 hrs

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**“Lady, you said one of the objectives was to enjoy myself. You’re killing me here.”**

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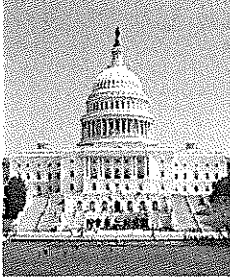
**“You know, Moore’s Law and Buckminster’s Knowledge Curve...duh.”**

Revel in how impressed Your Colleagues Will Be when you tell them the reason they have use an EHR is because computing power and human knowledge is growing exponentially.



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**Who’s Really To Blame?**



- Dept. of Health & Human Services
  - 2004 Office of the National Coordinator (ONC) for Health Information Technology
  - 2009 Health Information Technology for Economic and Clinical Health Act (HITECH)

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**HITECH**


Billions of dollars towards adoption of Electronic Health Records

HIPAA on Steroids

Meaningful Use

HIT Policy Committee

HIT Standards Committee



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**Meaningful Use**

- “providers need to show they’re using certified EHR technology in ways that can be measured significantly in quality and in quantity.”
- Defined stages coupled with CMS EHR Incentive Programs

<https://www.hitechanswers.net/ehr-adoption-2/meaningful-use/>

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**Meaningful Use Stages**

2011-2012	2014	2016
Stage 1	Stage 2	Stage 3
Available 1/1/2011	Available 1/1/2014	Available 1/1/2016

Meaningful use is using certified electronic health record (EHR) technology to:

- Improve quality, safety, efficiency, and reduce health disparities
- Engage patients and family
- Improve care coordination, and population and public health
- Maintain privacy and security of patient health information

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**Meaningful Use Is Health Technology**



- Better clinical outcomes
- Improved population health outcomes
- Increased transparency and efficiency
- Empowered individuals
- More robust research data on health systems

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## Simplify Please



1. Build, Design, Implement Electronic Health Records
2. Train Healthcare Professionals & Educate Consumers
3. Use Health Information Exchanges (HIE) To Securely Share Health Records
4. Use The Data To Improve Treatments & Systems


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## Let's Recap

- This is a high level overview of huge concepts and hundreds of single-spaced pages of text
- Objectives: Enjoy our time, increase knowledge of what is healthcare tech, increase confidence discussing healthcare tech and empowerment to lead the use

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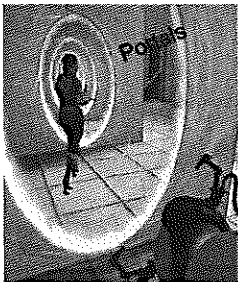
## Yes, Maybe NO!



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## You Are Becoming An Expert

- Moore & Buckminster
- ONC & HITECH
- Meaningful Use
- Stages
- EHR/EMR Electronic Health Records
- HIE Health Information Exchange



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## More Meaningful Use



I don't like having 6 of them!

- Mine
  - Primary
  - Specialist
  - Dentist
- My kids'
- My dog's


Patient Portals Stages 1 & 2  
E-prescribing & Lab results in Patient Portal and shared between organizations... Stage 2

Decision Support for high priority conditions & Population Health Stage 3

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## HIPAA and PHI (Protected not Private)

- Health Insurance Portability and Accountability Act
- The Guide has CHAPTERS
- It's called a Suite of Regulations
  - Privacy Rule
  - Security Rule (Encryption, BAs, Firewalls, Passwords and it goes on & on)
  - Breach Notification Rule



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## Telemedicine

- Telemedicine is playing a major role in healthcare delivery
  - Revenue in U.S. expected to reach \$1.9 billion by 2018, up from \$240 million in 2013.<sup>1</sup>
  - Projected growth rate of 56%.<sup>2</sup>
- Healthcare consumers are engaged, cost-conscious, tech savvy, and convenience driven.

<sup>1</sup> According to information and analytics firm IDC (Information Technology Services, Make Use)  
<sup>2</sup> Figure quoted by MDLIVE

## Niche Technology to Standard of Care

Over 50 Years of Advancements in Telemedicine

<b>1960s</b> NASA and others undertake telehealth research initiative to remotely monitor astronaut health	<b>1973</b> The American Journal of Psychiatry publishes major article on telepsychiatry	<b>1993</b> American Telemedicine Association is founded	<b>2016</b> Kaiser Permanente conducts more than half of all lab tests encounters virtually
<b>1970</b> "Telemedicine" coined as a term	<b>Late 1980s</b> US Military implements telemedicine technology in several natural disasters and conflicts	<b>2015</b> Major telehealth vendor conducts one million virtual visit	

## Millennials Favor Mobile Healthcare

- 82% of 18-34yr olds prefer telemedicine
- 54% postpone appointments for the following reasons:
  - 30% cannot take time off work
  - 25% high costs, co-pays
  - 16% takes too long to get seen
  - 12% long waits in office
- 71% of 18-34yr olds most likely to cancel appointments

Data provided by MDLIVE

## Telemedicine 411

- Asynchronous
  - Store and forward (radiology, dermatology, EKGs, etc...)
  - E-mail/electronic communication
  - Web-based management
- Synchronous
  - Medical visits on demand
  - Remote monitoring (hospitalist, ICU, ED, Transport)
  - Remote/virtual patient visits
- Facilitated
  - Depending on available diagnostic exam devices and facilitator's level of expertise, facilitated encounters can replicate quality and outcomes of specialty in-person appointments
- Non-facilitated/Direct to Consumer/On-demand
  - Non-facilitated telemedicine encounters rely on the patient or a family member and the provider alone to ensure effective communication and assessment and often no ancillary devices are used to assist with exam.

## Employers Empower Workforce Health

### Telehealth Interest Driven By Employers' Need to Cut Costs of Healthcare & Illness

**\$226B**

Cost of absenteeism to U.S. employers\*

Embracing Telehealth to Contain Costs

70% → 90%

Large employers offering telehealth services in 2016<sup>†</sup>      Large employers planning to offer telehealth services in 2017<sup>†</sup>

\*Data measured annually. Data from the Centers for Disease Control and Prevention. TeleHealthWatch.  
†Source: Grantland C. "Workforce Health and Care: Cost US Employers \$22.6 Billion Annually." IDC Forecaster. Retrieved 24 September 2016. Available at: <http://www.idc.com/analysis/forecast/2016-09-24-workforce-health-and-care-cost-us-employers-226-billion-annually>. Accessed 4 September 2016.  
†Source: "Employers Favor Telehealth: New Research Shows Interest in Telehealth is on the Rise in 2017." National Business Group on Health. Survey Finds: Telehealth Interest on the Rise. 2016. <http://www.nbg.org/2016/09/22/telehealth-interest-on-the-rise/>. Accessed 4 September 2016.

## mHealth, RPM & Wearables

- There are roughly 200,000 healthcare APPs
- There are THOUSANDS of devices and gadgets in the healthcare wearable market
- Remote Patient Monitoring market grew 44% in 2016

<http://www.healthcareitnews.com/content/remote-patient-monitoring-market-grew-44-percent-2016-report-says>

## Cool Tools

<https://www.youtube.com/watch?v=iOgt85cPU8Q>

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## Objectives

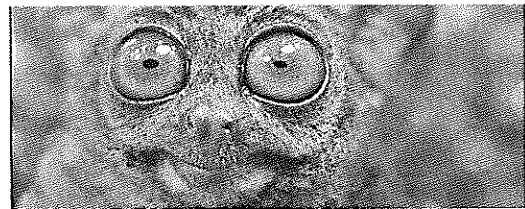
- To enjoy the next 45 mins or so while ...
- Increasing our knowledge of what healthcare technology encompasses
- Improving our confidence with healthcare technology and some of the many ways it can help to improve outcomes.
- Becoming empowered to lead the use of healthcare technology

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## Yes, Maybe NO!



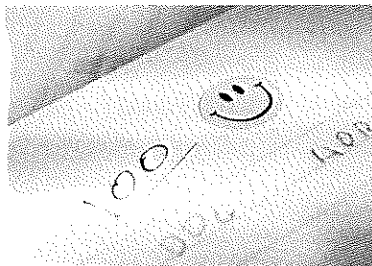
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**"This morning, instead of water, I put RedBull in my coffee.  
Now, I can SEE noises."**

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## Any Questions!?!



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