The Answer is Digital…
…but what's the Question?

Professor Keith McNeil
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Chief Clinical Information Officer
Queensland Health

Our Challenge…

How do we move from data,

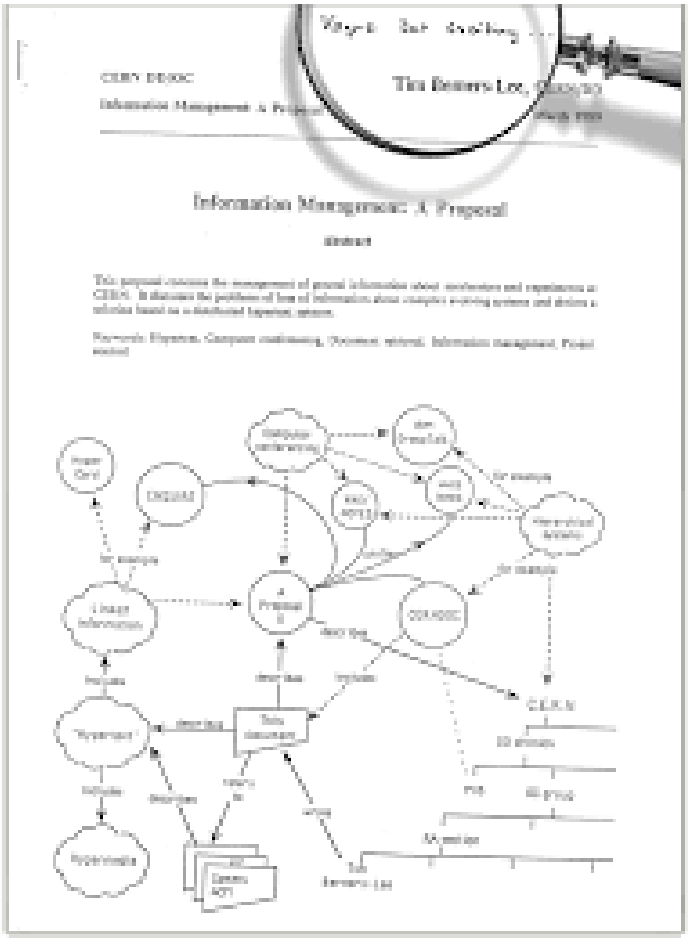
to highly effective decision making?

The path to…

"Vague but exciting"

Mike Sindall ***1989***

Information Management: a proposal



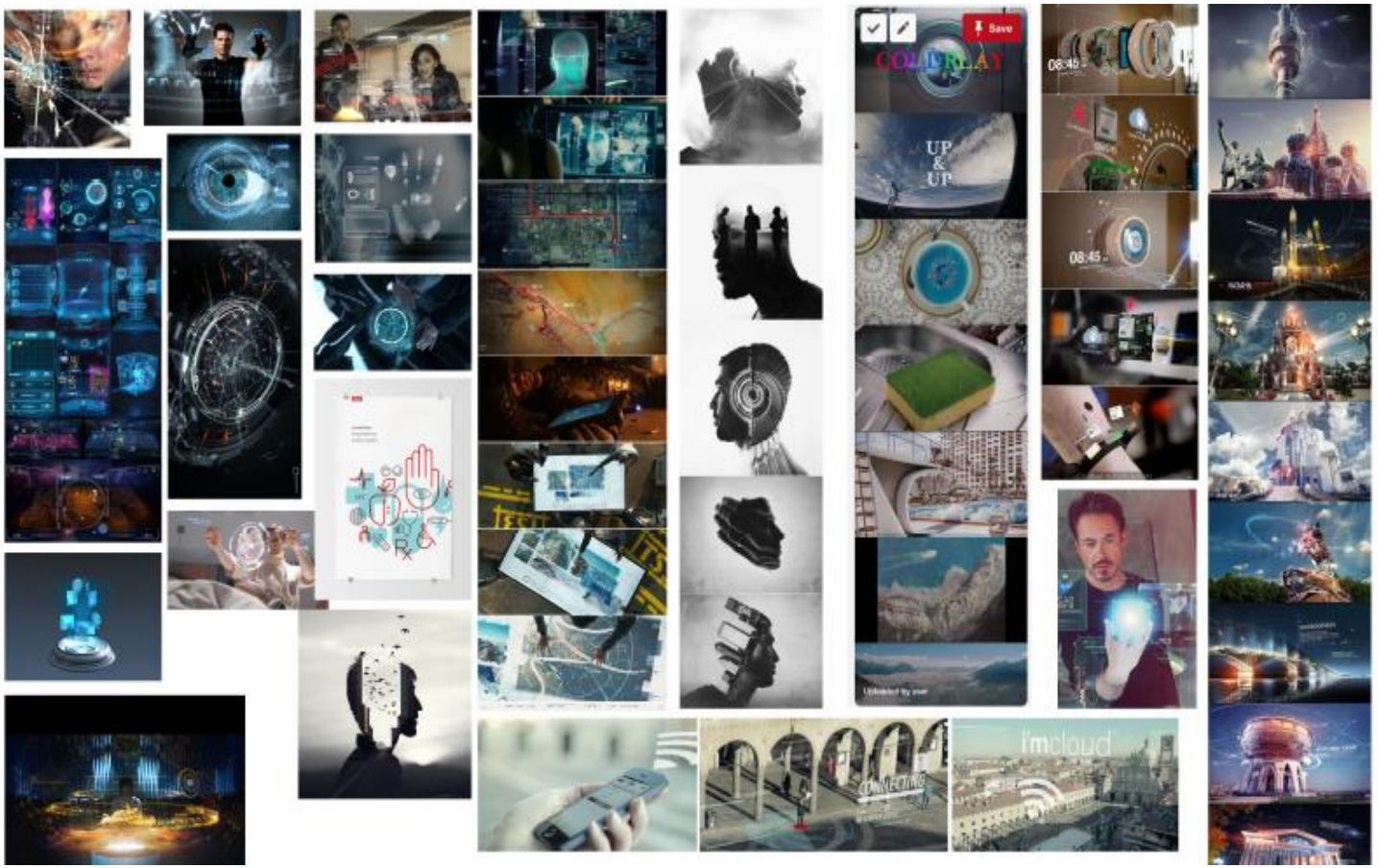
- www…

"In those days, there was different information on different computers, but you had to log on to different computers to get at it.

Also, sometimes you had to learn a different program on each computer.

Often it was just easier to go and ask people when they were having coffee…",

…the here & now



…the here & now…in healthcare!

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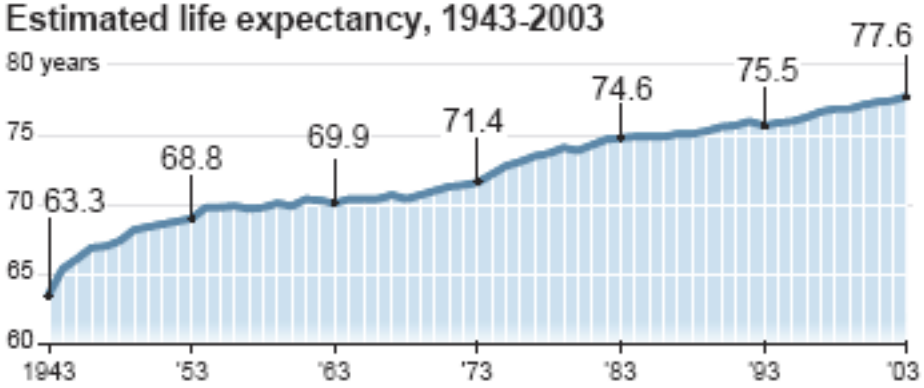
This is all about patient outcomes …not just technology!

Great news!

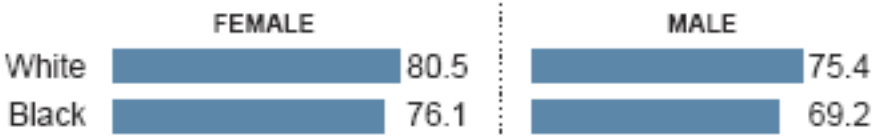
Life expectancy reaches all-time high

Declines in death rates from most major causes have pushed Americans' life expectancy to a record 77.6 years.

Estimated life expectancy, 1943-2003



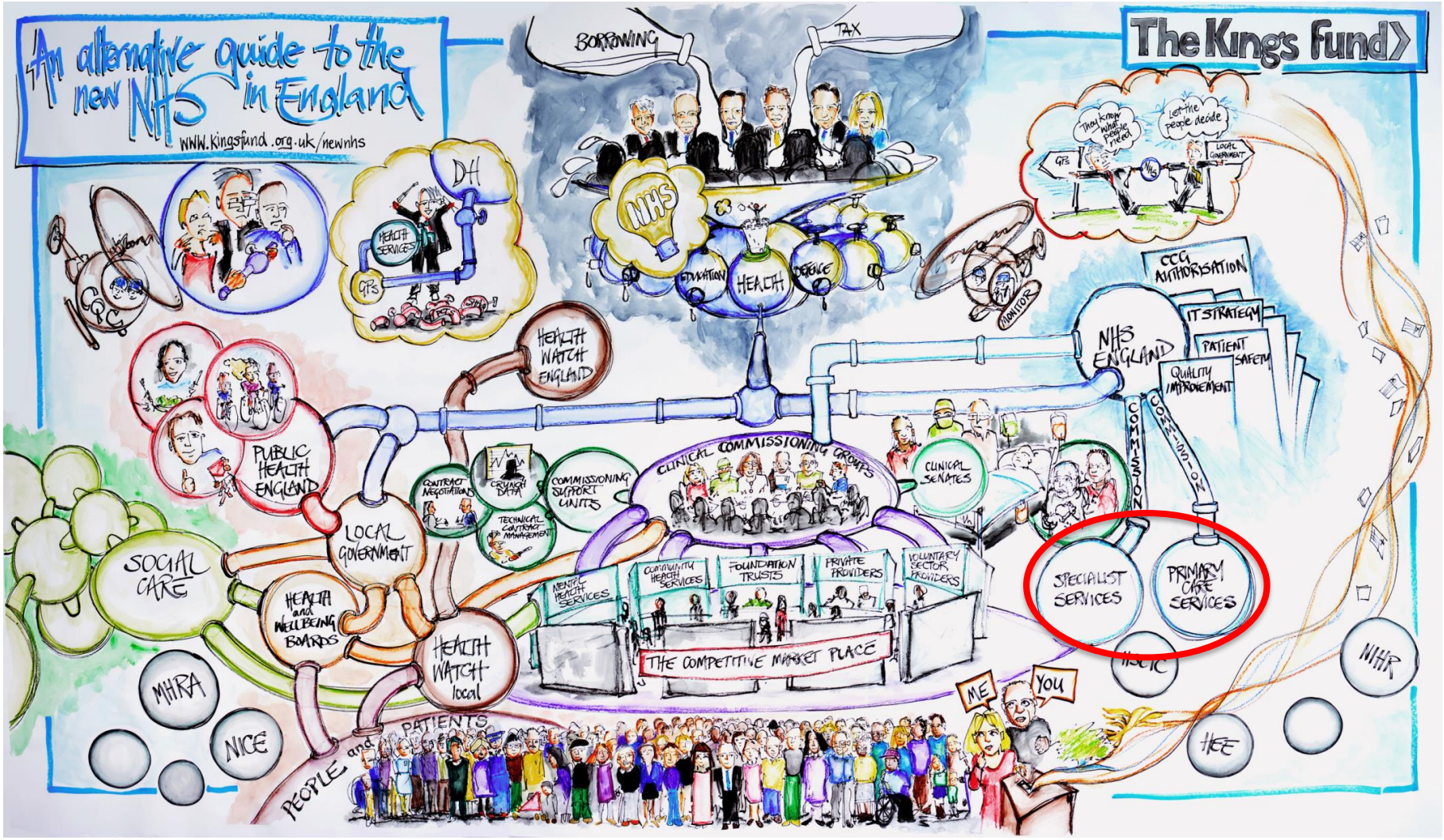
By race and gender, 2003



SOURCE: Centers for Disease Control and Prevention AP

Healthcare in the 21st century

And, we have made an unholy mess of it !



Information & Chaos

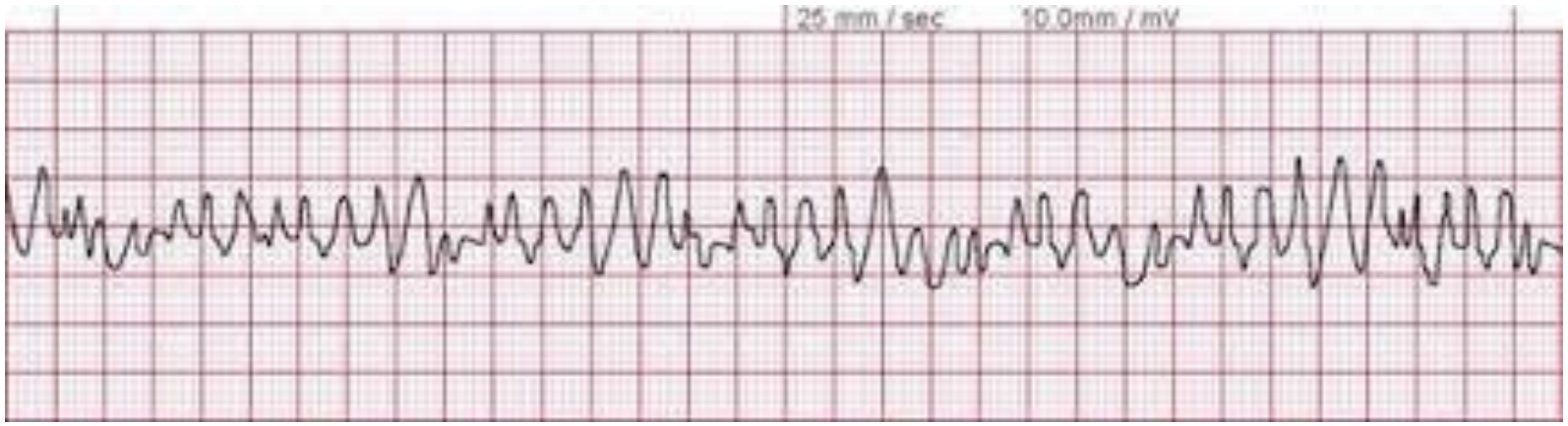
- ***Information*** brings order to chaos…

  …***data enables the reduction of uncertainty***

- Our understanding of ***complexity & chaos*** is dependent on the quality of the ***information*** we have available

- **Chaos is not random**
  - It only appears unpredictable because we can't measure & interpret all the variables and variation in the data
    - ventricular fibrillation…

Ventricular fibrillation – not random after all (but it is chaotic!)



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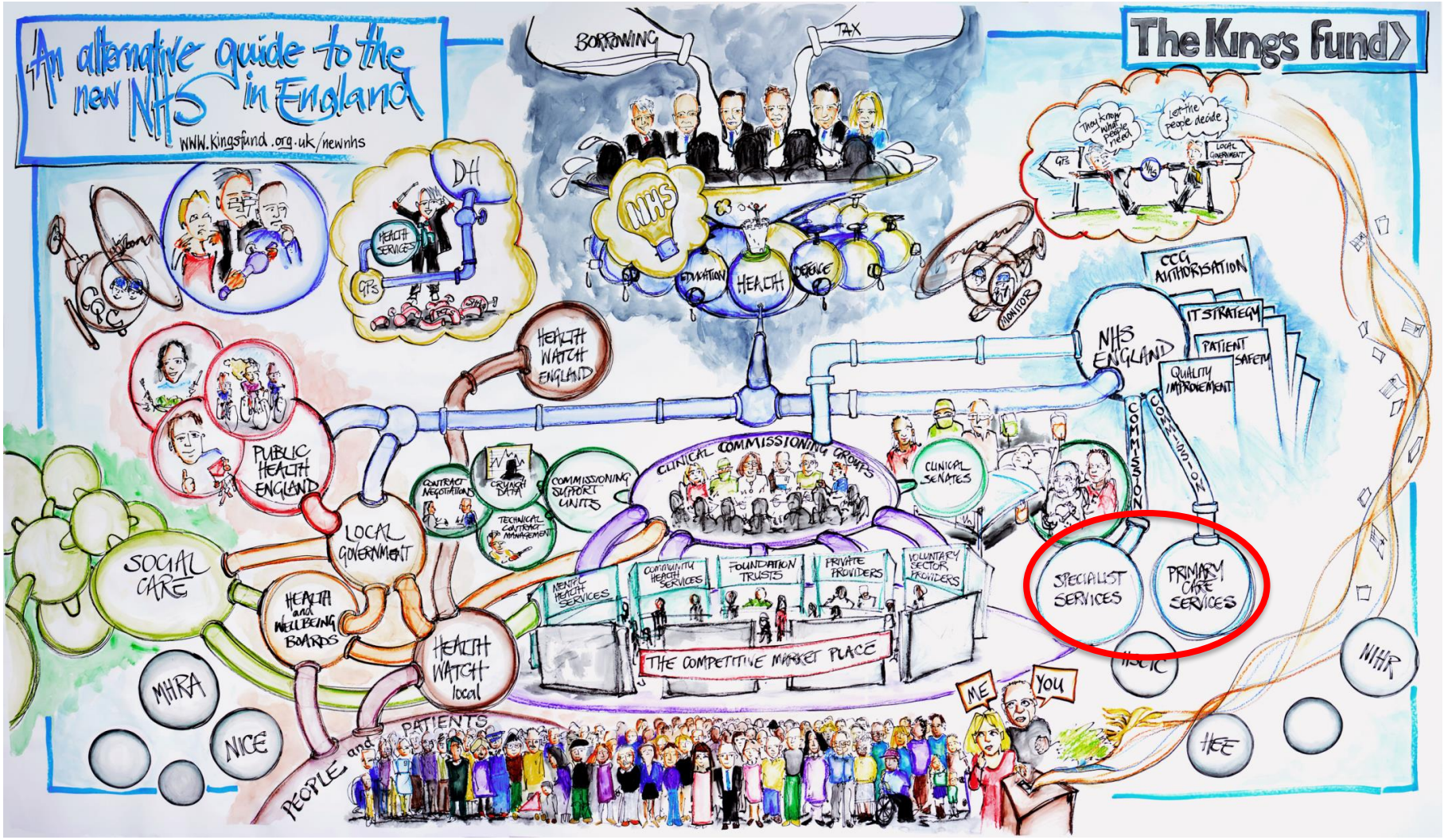
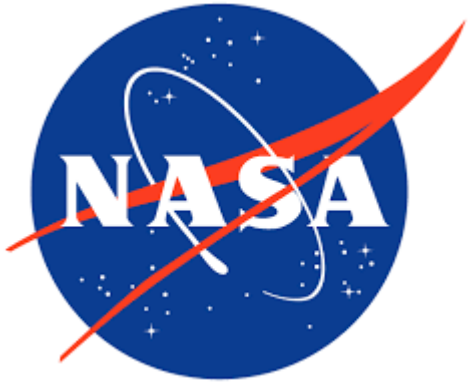




- The Moonshot
  - First US manned space mission in 1961
    - Apollo 11 just 8 years later
  - required radical re-thinking around organisational dynamics and ***information sharing***
  - critically reliant on networks and communications between these different groups
    - complex adaptive organisation

Challenger 1986

JTO in Iraq

- 2003
  - 13 missions per month
  - command & control organisation
    - information shared on a “need to know” basis
- 2007
  - 300 missions per month
    - little increase in funding or personnel
  - complex adaptive organisation – “team of teams”
    - shared intelligence
    - high quality, real time information access
    - everybody “needed to know"!

Information in the 21st century

Critical for dealing with complexity

- Allowing ecosystems to become ***self-organising***
  - fostering ***organisational resilience*** at every level
  - ***distributed decision making*** is key
    - dependent on the ***availability and flow of information***

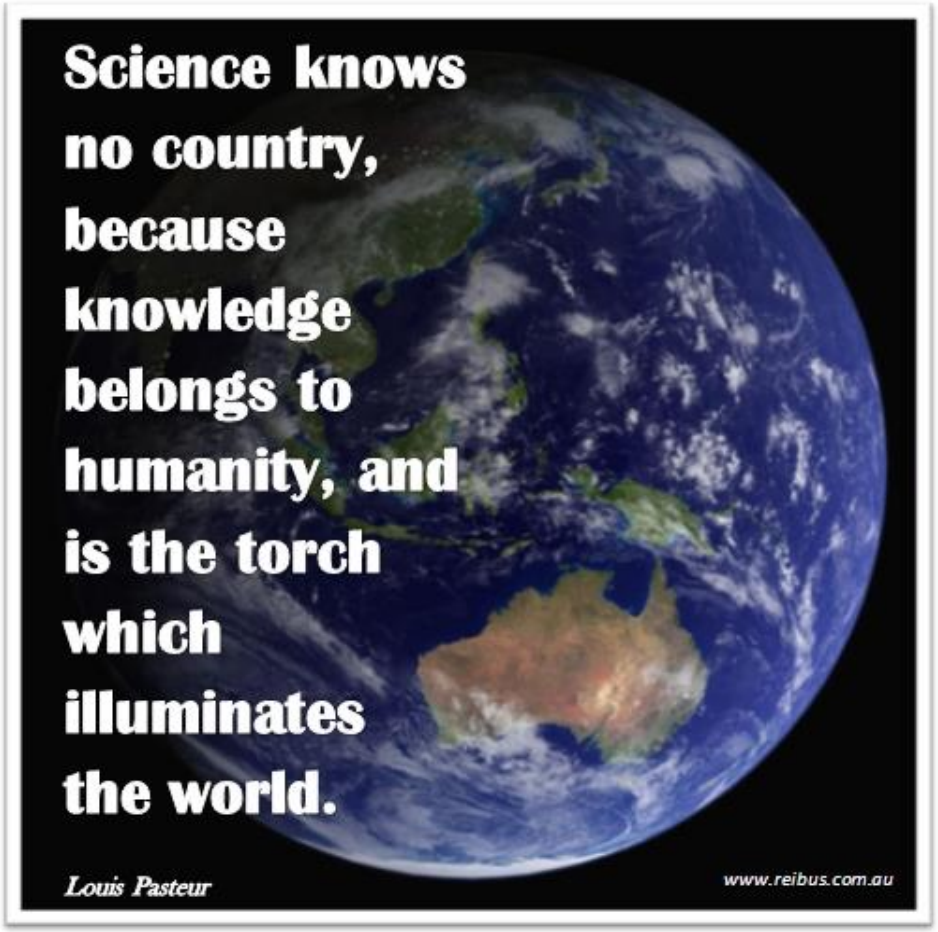
The 17 minute story

Leadership in the Digital Age

As in any age, leadership is critical to encouraging and enabling ***innovation***;

…and ***engaging and empowering*** those who actually deliver, and are recipients of, healthcare services

…democratise data



which brings us to…

Our Digital Health Agenda

Data data everywhere and not a byte to think

Why digital?

- Last 2 years
  - more data generated than in all human history
  - by 2025 - 47 zetabytes!!!
- 100,00 genomes = 21 petabytes
    - 1 Pb music – 2000 years of continuous playing!
- Opportunity for use of AI & machine learning
  - reliant on accurate longitudinal data sets

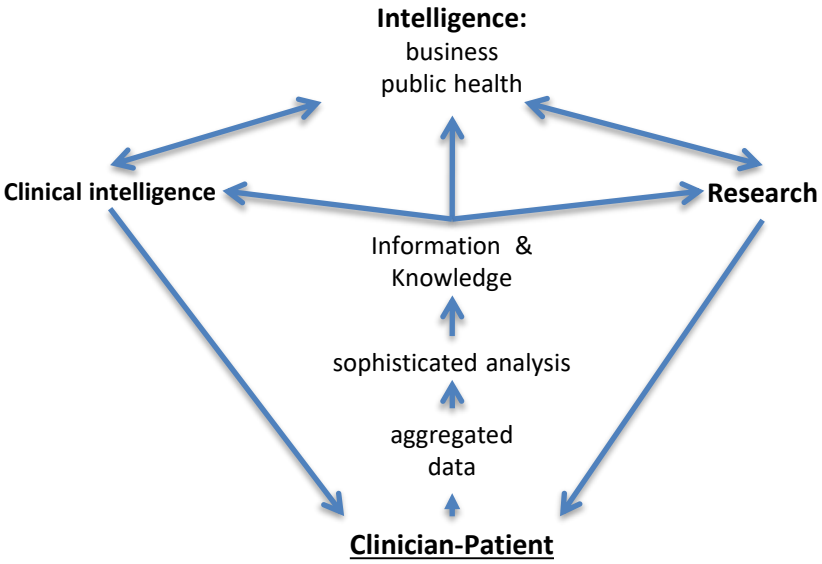
There is a better way!

RE:IMAGINE

The Aim…

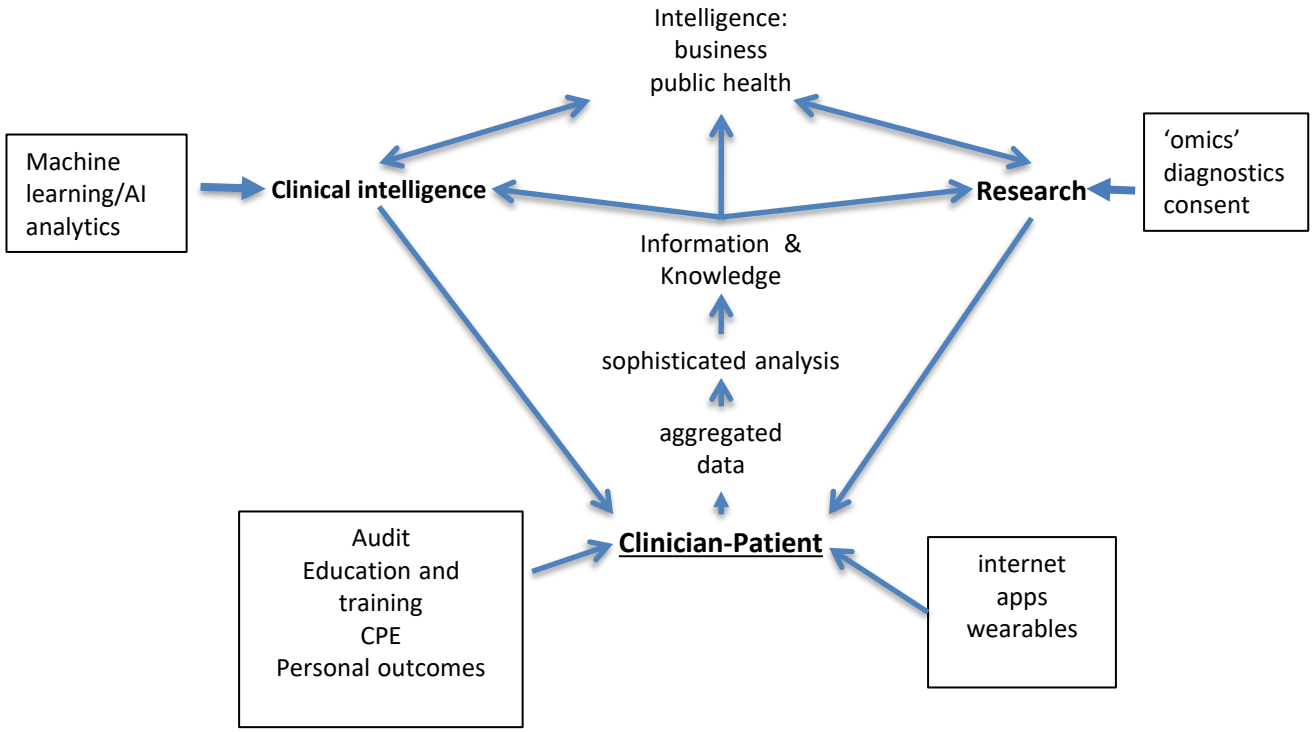
- Create ***learning/knowledge based organisations***; at all levels
  - use ***information & knowledge*** to make more informed and therefore better decisions
    - at all points of decision making

Towards a ***learning & knowledge based*** system



“Virtuous Circle”

…and on to ***precision medicine***



System Sustainability

The Two Keys to Unlocking the Productivity Paradox of Digital Transformation

Improve the technology

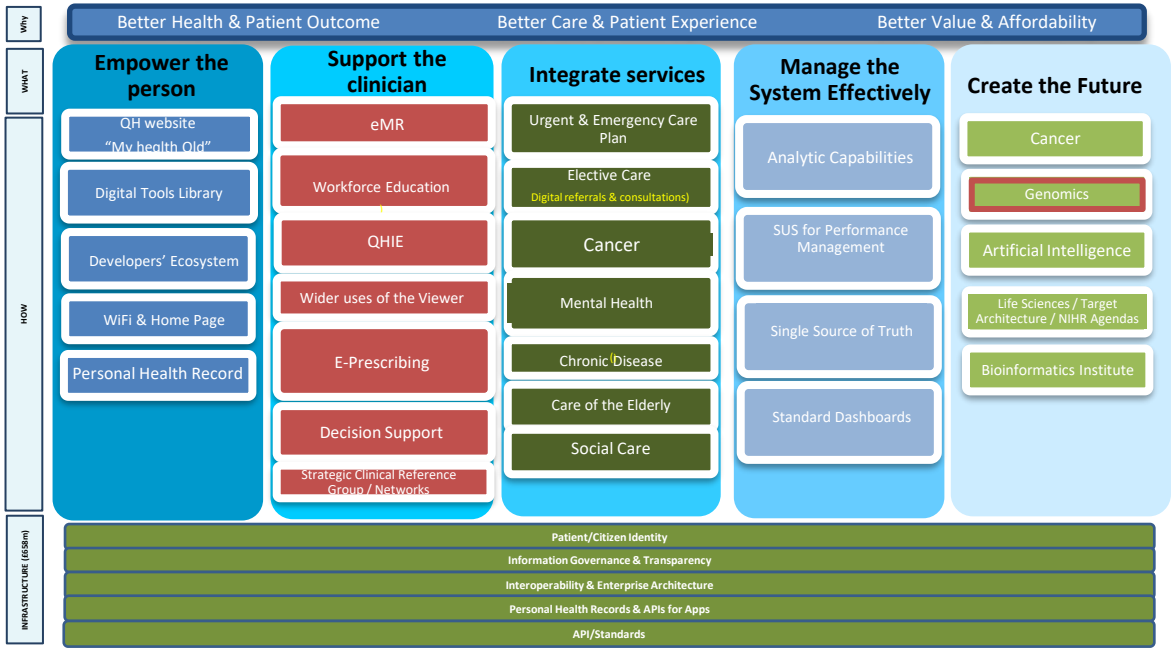
Reimagine the work itself

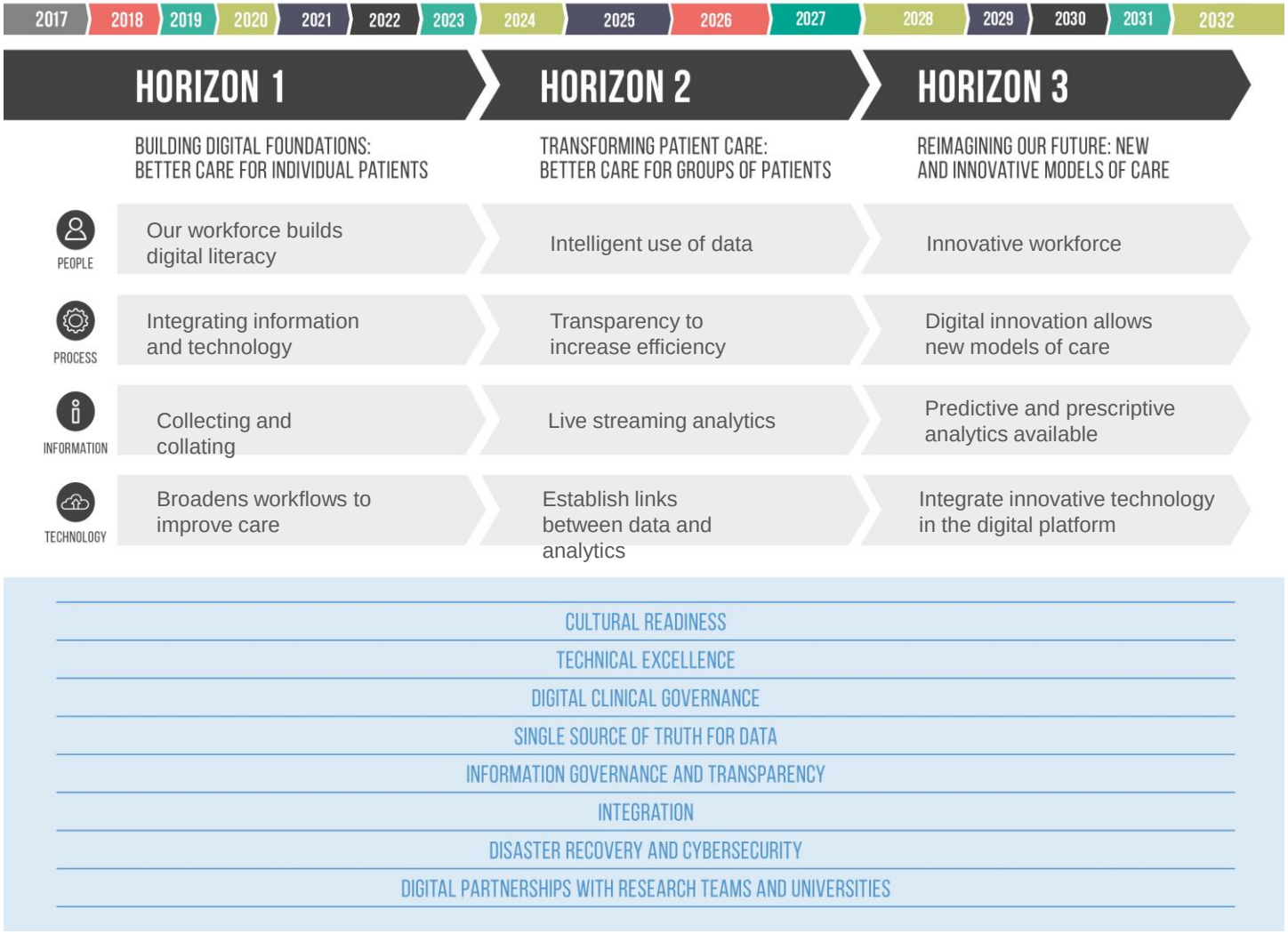
Reference: Erik Brynjolfsson, MIT

The Strategy…

- Enable structured/standardised ***data*** collection from across the system
    - We all talk the same language
- Enable that ***data*** to be distributed across the system
    - JTO productivity dividend
- Encourage innovative ways of capturing ***data***
    - wearable's, apps etc
- Facilitate analysis and application of ***data*** at multiple levels
    - local, population, cohort, metadata sets, ‘big’ datasets

Digital Transformation of Healthcare




2017
2018
2019
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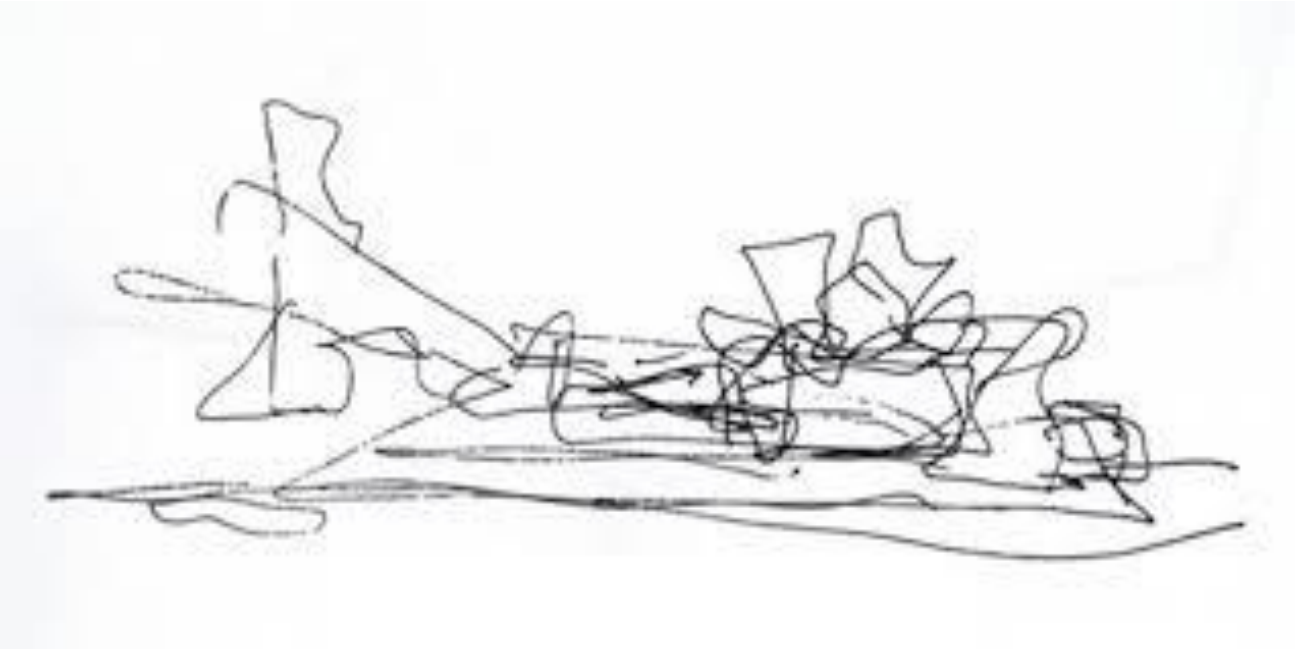
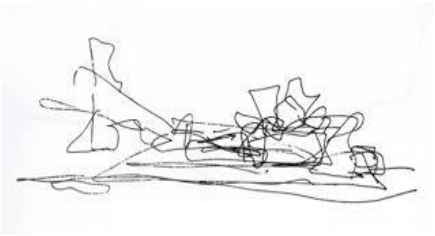
2029
2030
2031
2032
HORIZON 1
HORIZON 2
HORIZON 3
BUILDING DIGITAL FOUNDATIONS: BETTER CARE FOR INDIVIDUAL PATIENTS
TRANSFORMING PATIENT CARE: BETTER CARE FOR GROUPS OF PATIENTS
REIMAGINING OUR FUTURE: NEW AND INNOVATIVE MODELS OF CARE
PEOPLE
Our workforce builds digital literacy
Intelligent use of data
Innovative workforce
PROCESS
Integrating information and technology
Transparency to increase efficiency
Digital innovation allows new models of care
INFORMATION
Collecting and collating
Live streaming analytics
Predictive and prescriptive analytics available
TECHNOLOGY
Broadens workflows to improve care
Establish links between data and analytics
Integrate innovative technology in the digital platform
CULTURAL READINESS
TECHNICAL EXCELLENCE
DIGITAL CLINICAL GOVERNANCE
SINGLE SOURCE OF TRUTH FOR DATA
INFORMATION GOVERNANCE AND TRANSPARENCY
INTEGRATION
DISASTER RECOVERY AND CYBERSECURITY
DIGITAL PARTNERSHIPS WITH RESEARCH TEAMS AND UNIVERSITIES

Where we are we now…





Where we want to be…

- A learning & knowledge based organization at all levels, at the cutting edge of digital medicine, where:
  - individuals use data to drive their own Q
    - » improving patient and organizational outcomes
  - learning and benefits are shared across the system
  - system sustainability and enhanced effectiveness is embedded

From Data to Decisions…

Decisions

Prescriptive
Tell us what to do before it happens!

Predictive
Tells us what's going to happen

Data

Diagnostic
Tells us why it happened

Descriptive - the rear view mirror
Tells us what's happened

…and this is how we will transform healthcare