Re-imagining Healthcare
from an ecosystemic perspective

IDEA SPARKERS

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Our Context

18th, 19th, 20th C
infrastructure

50 yrs

The era(s) of
relative stability

S-curve
stable over decades.

20th Century Era Captured by Alfred Chandler
Push Economy

20th century infrastructure
roads/cars/trucks/trains/ships/airplanes

Infrastructure capabilities drive organization architecture

And *Scalable Efficiency* becomes the goal.

S-curve
stable over decades.
(Few real changes in 60 years)

• predictable
• hierarchy
• control
• organizational routines
• minimize variance

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then

The Big Shift Happened

21st C infrastructure: no stability in sight
driven by continual exponential
advances in computation

18th, 19th, 20th C
infrastructure
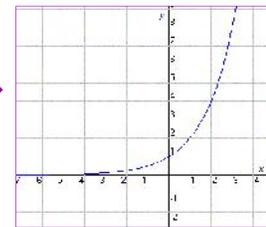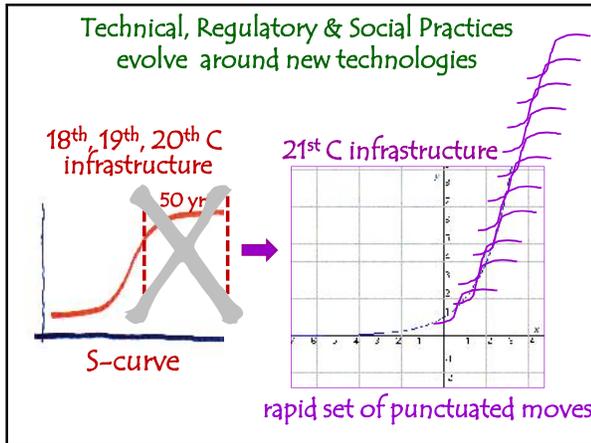
50 yrs

S-curve
stable over decades.

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Technical, Regulatory & Social Practices
evolve around new technologies

18th, 19th, 20th C
infrastructure

21st C infrastructure

50 yr

S-curve

rapid set of punctuated moves

We have moved from
an era of equilibrium to
a new normal-
an era of constant dis-equilibrium.

Our business models and
our ways of working,
organizing, innovating, etc
needs to be reframed.

here is what is happening in the corporate
world when we got stuck with yesterday's lenses
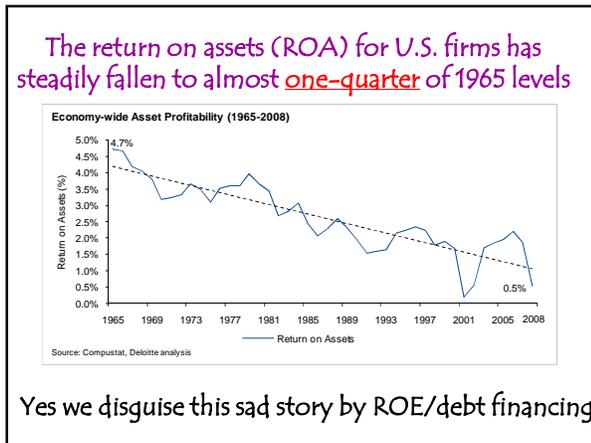
The return on assets (ROA) for U.S. firms has
steadily fallen to almost one-quarter of 1965 levels

Economy-wide Asset Profitability (1965-2008)

4.7%

Return on Assets (%)

5.0%
4.5%
4.0%
3.5%
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%

0.5%

1965 1969 1973 1977 1981 1985 1989 1993 1997 2001 2005 2008

—— Return on Assets

Source: Compustat, Deloitte analysis

Yes we disguise this sad story by ROE/debt financing

We have moved from
an era of equilibrium to
a new normal-
an era of constant dis-equilibrium.

Our approach to healthcare also
needs to be reframed.

we now have 4 great IT pillars
Cloud + Mobile + Social + Big Data (nosql)
Each advancing at exponential rate that together
could be a real game changer!

Potential Shifts of Focus

Sickness ===========> Wellness
from thinking disease as a thing
to wellness as dependent on context

Quantified self to the extreme
from physician as driver to physician as consultant

Content ===========> Context
Shaping context to change behavior

1st Shift of Focus

Sickness =======> Wellness
from thinking disease as a thing
to wellness as dependent on context

This shift means:
we need to think about
health and
personalized healthcare
not like a watch
but like an
emergent, complex
ecosystem

ecosystems are alive

"A mechanical system—a watch for instance—is divisible, while an ecosystem is indivisible because of well developed interdependences."

Because ecosystems are indivisible, they are environments where all work feeds back into the system, affecting the entire system.

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combining deep science
(genetics &integrated systems biology)
with participatory platforms (PHR, Games)

P4 medicine is the beginning of
thinking ecosystemically

P4 Medicine – a novel approach
to individualized medical care

P4 PREDICT shift from waiting for disease to develop to understanding propensities.

P4 PREVENT applying treatments or behavioral changes to delay the onset of disease.

P4 PERSONALIZE develop a life strategy wellness plan for each individual.

P4 PARTICIPATE empowering patients to create precise strategies to promote wellness & using social networks and gamification to get consumer to take ownership of their health.

EHR ---> PHR

Cancer as a _thing_ to
Cancering as an ecosystemic _process_
i.e. radically contingent on context

Danny
Hillis

David
Agus

BUT
if one cannot solve or model
complex systems, then what?

Three things you can work on:
boundaries
probes
modulators

listen to feedback, augment and amplify the good, quickly remove the bad, look for patterns and centers of gravity, nodes of efficacy.

Boundaries
determine what agents constitute the ecosystem

External: age related, disease related, geographic, socio economic, combination of these etc.
Internal: genetic and epigenetic

Probes
things you put in the system to read the system

biochemical: genetic and epigenetic testing

behavioral:
    medical data from devices – e.g. fitbit
    reality mining –digital breadcrumbs
            (real time/place with gps),
    behavior tracking with smart phones
    social network monitoring;
    micro-narratives;

Modulators
things you put in the system to read the systems affect change in the system

Biochemical: genetically targeted drugs

Behavioral:
games and gamification;
texting for health;
psychology;
coaching

Gamification
use of game play mechanics for non-game applications.

motivation through accomplishment, peer approval, status building, fun

leveling up may be one of the most important drivers of incremental change.

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mcgonigal social chocolate
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Slide 1

World of Workcraft

Slide 2
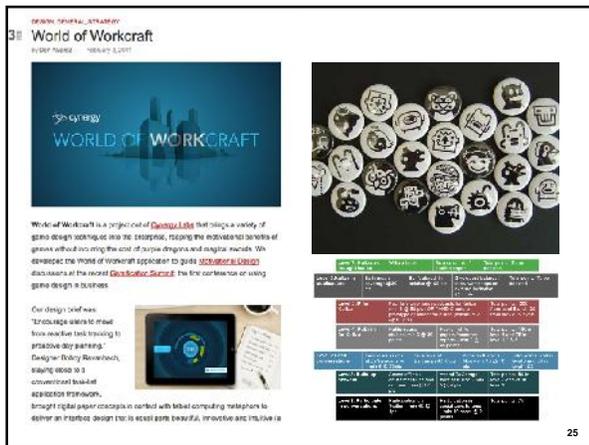
Texting 4 Health

using smart phones as prompts,
coaches,
aggregating information for
early disease detection . . .

Slide 3

2nd Shifts of Focus
The (extreme) Quantified Self

I know about QS but extreme????

Slide 4

Larry Smarr

Slide 5

Slide 6

Larry Smarr' Approach
comprehensive
integrated
data collection over time!!

Externals: diet, exercise, sleep, stress reduction

Internals: Genomic analysis
100 blood variables monthly
Stool samples for microbiome analysis including metagenomic analysis
MRI imaging turned into 3D models

but are there elements of the ecosystem for health – wellness – Larry is missing?

what about the social dimension?

We are affected by our social networks in ways I never thought!

and shape (topology) matters, too.

Christakis and Fowler – how people's networks affect health

good summary: your friends' friends' friends affect everything you feel, think and do.
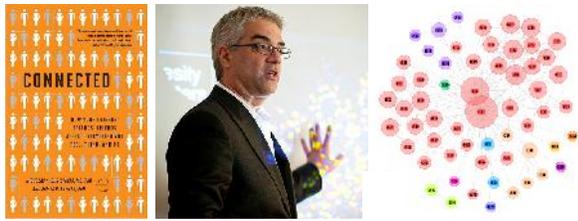
The Human Superorganism

Networks of cooperation can lead to self-sustaining "organisms," whether it be cells in a human body or human bodies in a neighborhood!

Friendship ties on Facebook

— Friendship Tie
● Obese
● Overweight
● Underweight
● Normal
■ Male
■ Female

Overweight Cluster of Women

Overweight Cluster of Men

Source: connectedthebook.com
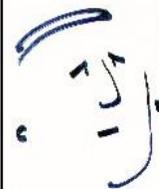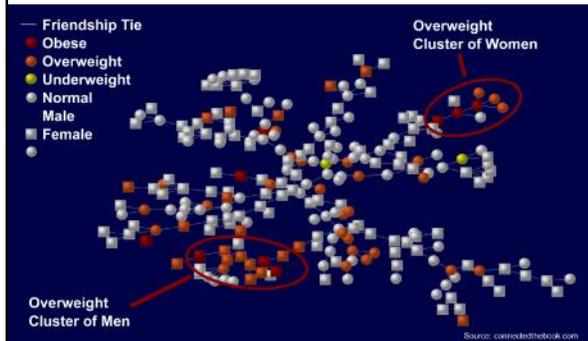
and what if the social network is not robust enough to scaffold?

"our social network can fray at the edges, like a yarn that comes loose at the end of a sweater. If we are concerned about combatting the feeling of loneliness in our society, we should aggressively target the people on the periphery with interventions to repair the social networks" (Christakis and Fowler)

Useful But A Bit Scary

Social bots can be designed to augment the shape and topology of a social network.

Web Ecology project
Socialbot competition 2011

Hmmm, sounds like Eliza has gone social on twitter

Socialbots — Day One

Socialbots: The End-Game

tim hwang   38
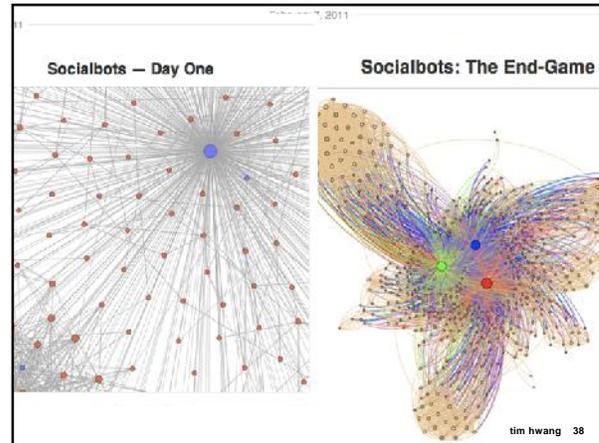
but are there elements of the ecosystem for health – wellness – Larry is missing?

Will data really change behavior as Larry suggests?

More generally
How do we really affect behavior especially at scale?

Might transmedia be a new tool here?

what is transmedia?

Transmedia storytelling is the technique of telling a single story experience across multiple platforms and formats . . .

…it involves creating content that engages the audience using various techniques to permeate their daily lives – multiple forms of media delivering unique pieces of content in each channel.

Movie   Book   Game   Typical Media Franchise

Whole is less than the sum of its parts: dissatisfying conclusion to consuming all media

Movie   Book   Game

Transmedia

Whole is more satisfying than the sum of the parts: euphoria in collecting and connecting the pieces
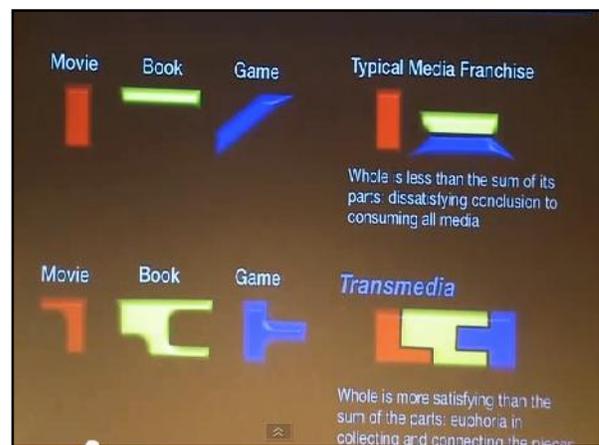
Harry Potter Worldwide Movement

Are we prepared for students used to creating their own global collective, intertwined with a networked imagination?

Fanfiction.com

65,000 stories & podcasts

forums
wikis
videos
podcasts
contests

HARRYPOTTERFANFICTION — THE STORY CONTINUES

6,314 communities of interest;   1,774 discussion forums;   386,000 stories archived

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most recently:
The Hunger Games

How does this work?

In transmedia stories are told as facts – and more than told only, they are enacted as well – pervasively, and extended over time for sustained emotional impact.
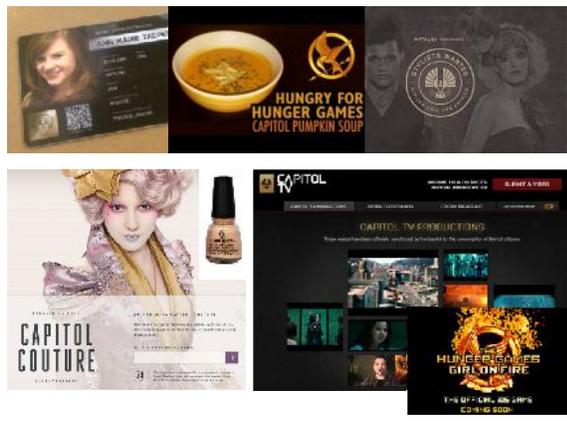
How does this work for health?

For providing information in context
For behavior role models and all the things one needs to do to 'be like'
For triggering
Support for sustaining

The Bigger Picture

The emerging era of long tail science

Powerful networked tools now allow small groups
of folks do amazing things in science
Some big science can now go small & distributed.

But what is missing is
a language of data
that captures context
to enhance share-ability.

Ah – honoring diversity of approaches
yet making the whole more
than the sum of the parts..

A Cambrian Moment

Reimagining Healthcare
Using emerging capabilities of
Science, IT and the Social
to move from sickness to wellbeing

Efflorescence to Flourishing

Thank You

THE POWER OF

P U L L
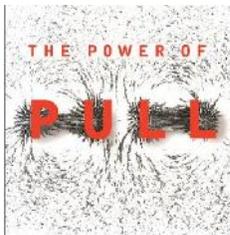
How *Small* Moves, *Smartly* Made,
Can Set *Big* Things in Motion

John Hagel III, John Seely Brown, and Lang Davison
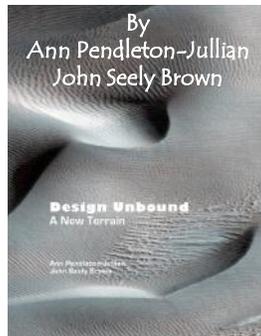
By
Ann Pendleton-Jullian
John Seely Brown

Design Unbound
A New Terrain

Ann Pendleton-Jullian
John Seely Brown