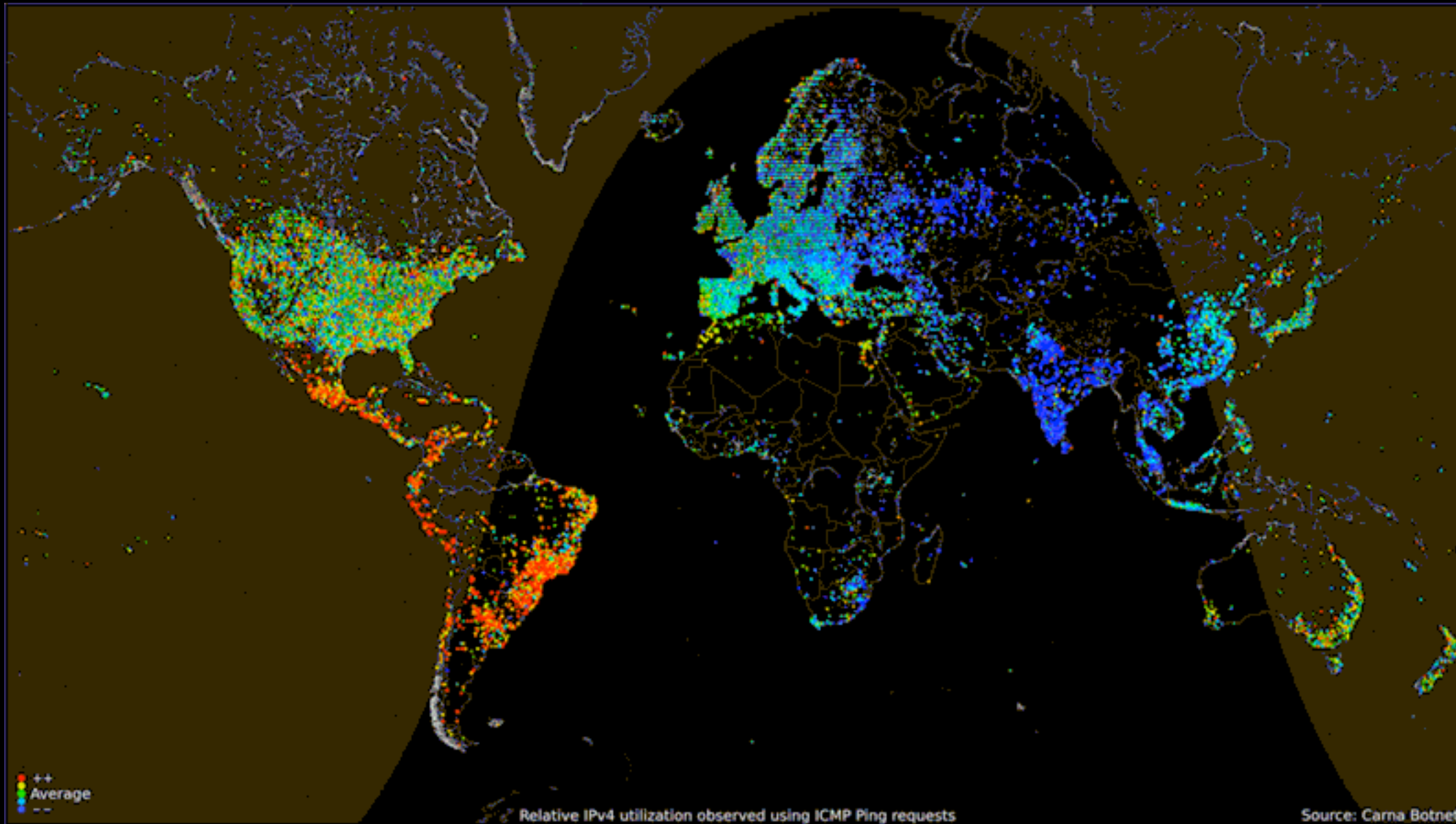


New Technology Architecture Opportunity

Graham McLeod
Founder/Chief Architect

inspired!

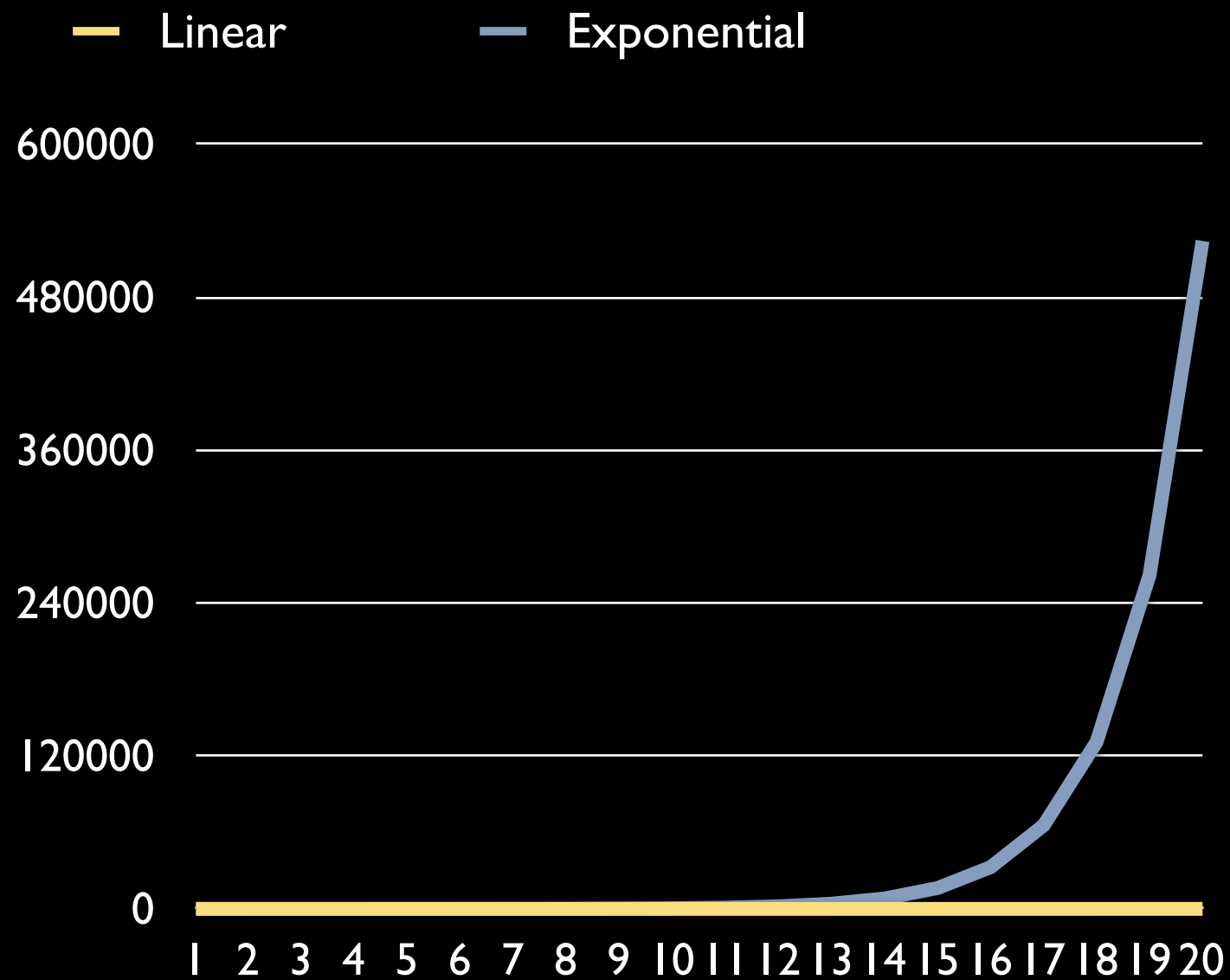
World Changers



Communications
Big Data
Analytics/Visualization
Digitization
Nano Technology
Social Networks
Semantic Technology
3D Printing
Energy
Medical Advances

http://twistedifter.files.wordpress.com/2013/08/internet-usage-of-the-world-based-on-time-of-day_2.gif

The Exponential Technologies



Computing

Storage

Communications
(Bandwidth)

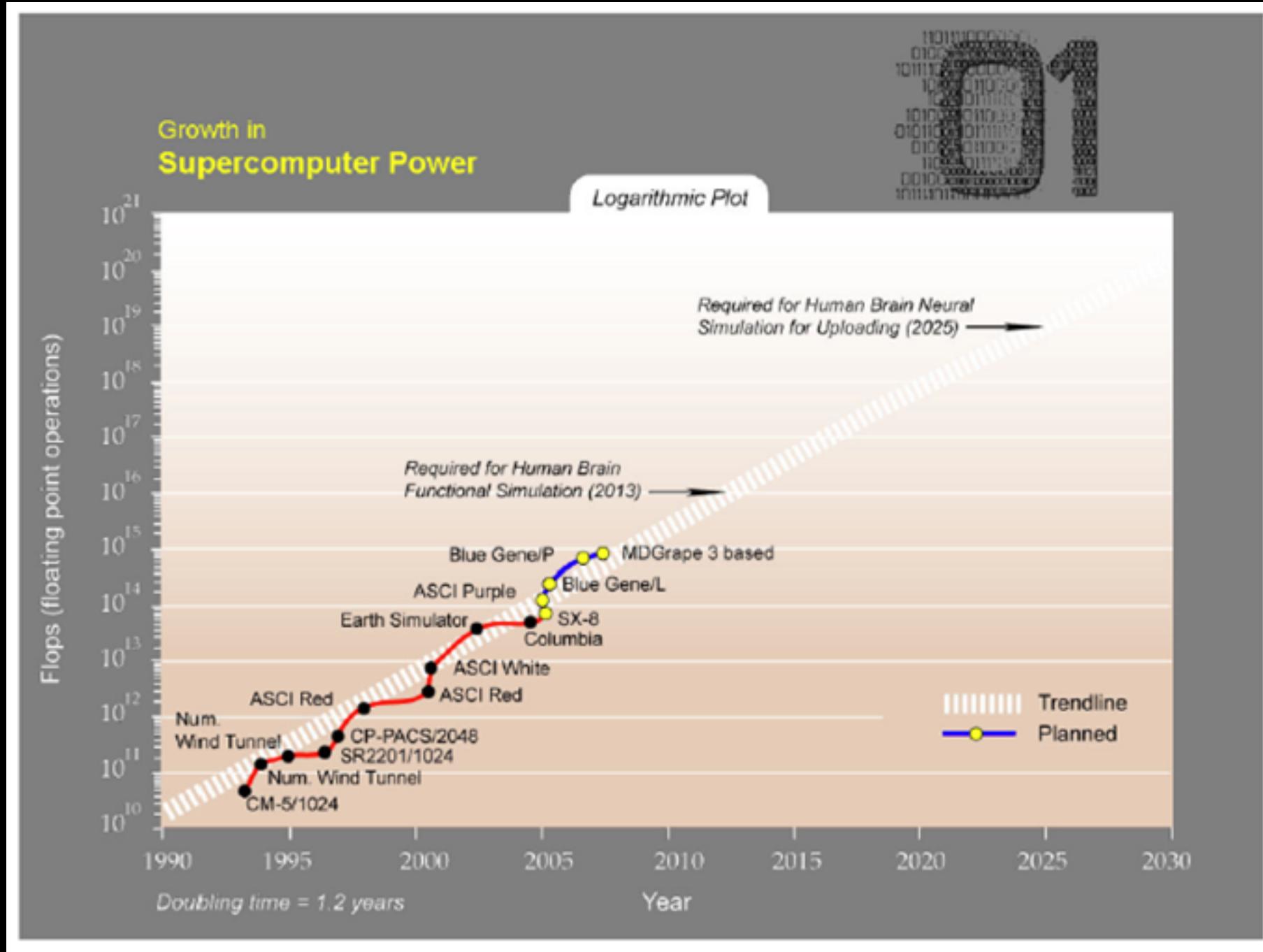
Sequencing

Network (Connections)

anything that gets
digitized...

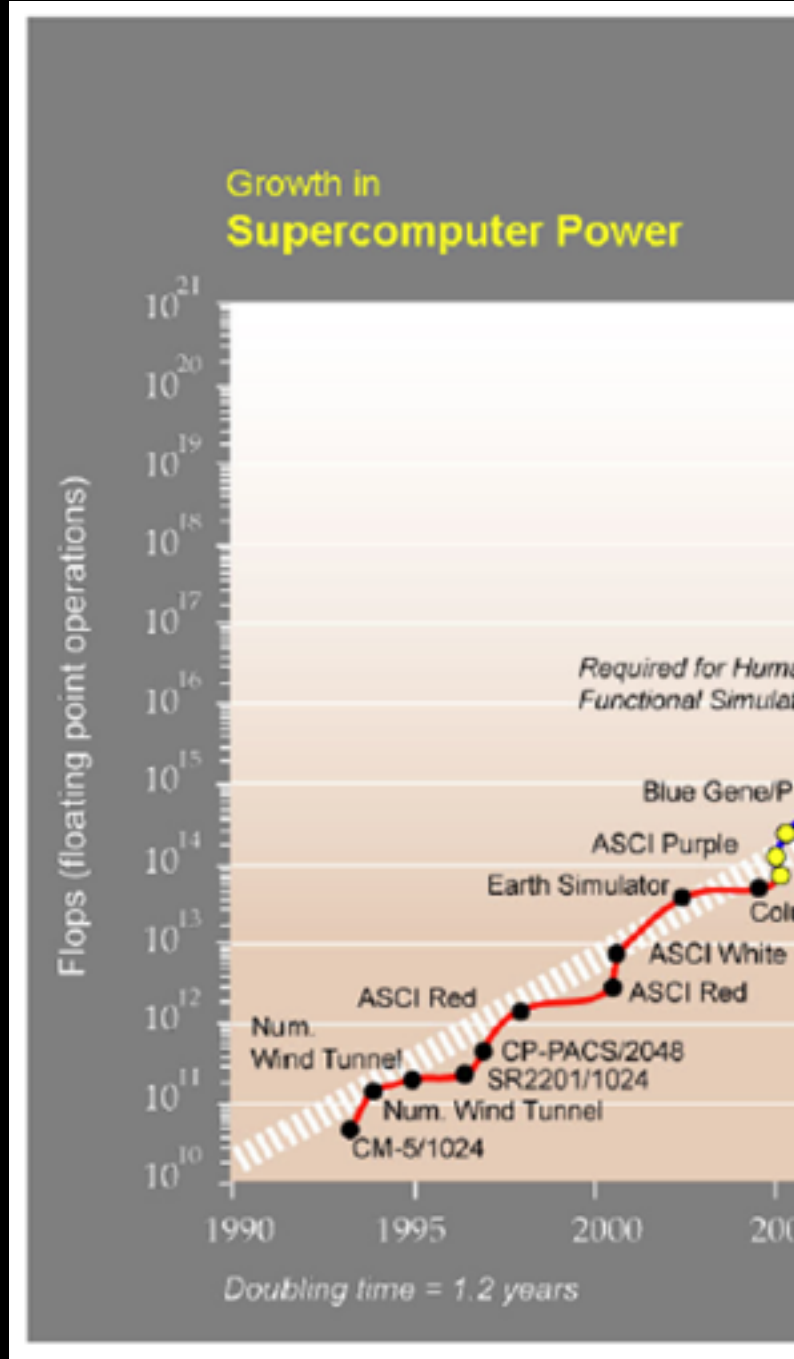
Technology Capability

Technology Capability

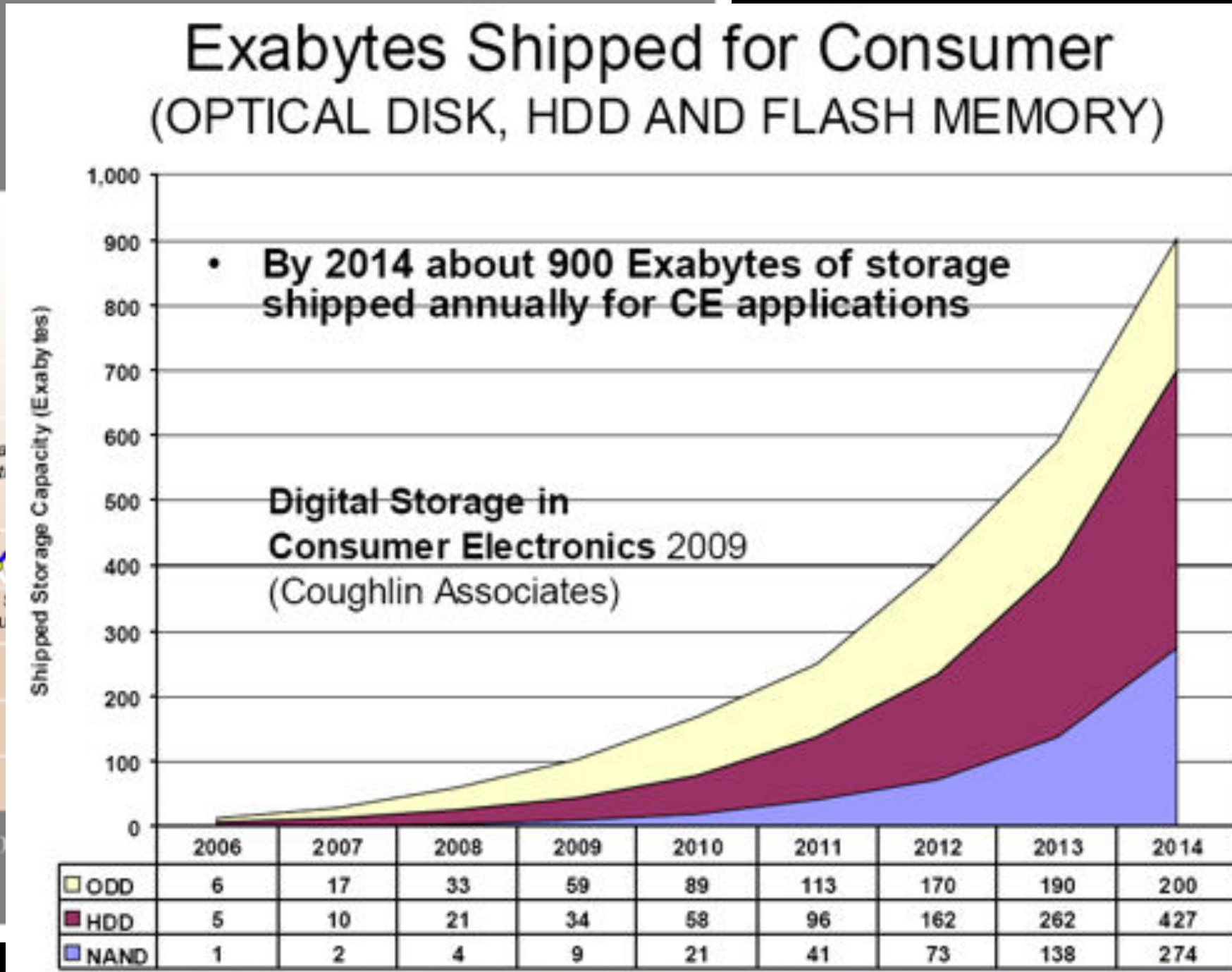


Source: Ray Kurzweil

Technology Capability

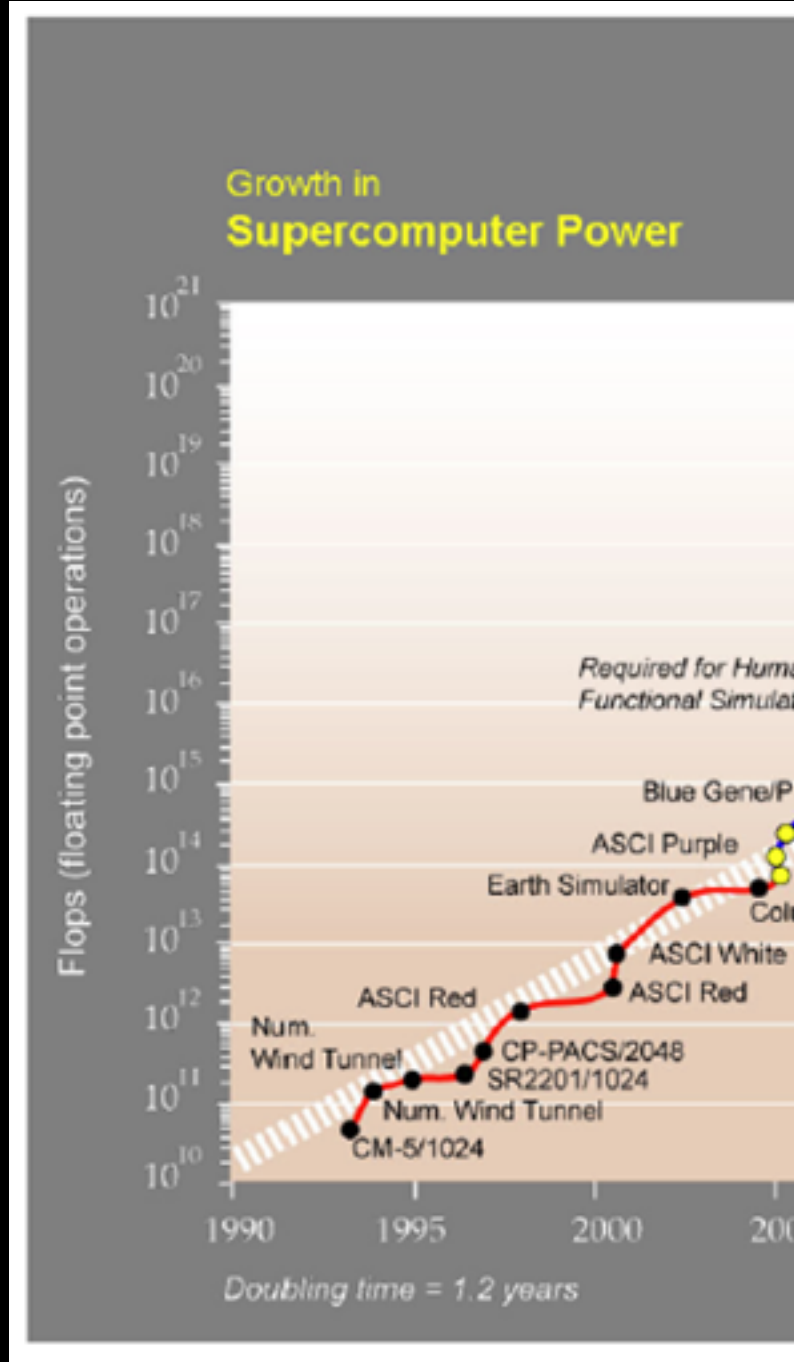


Source: Ray Kurzweil

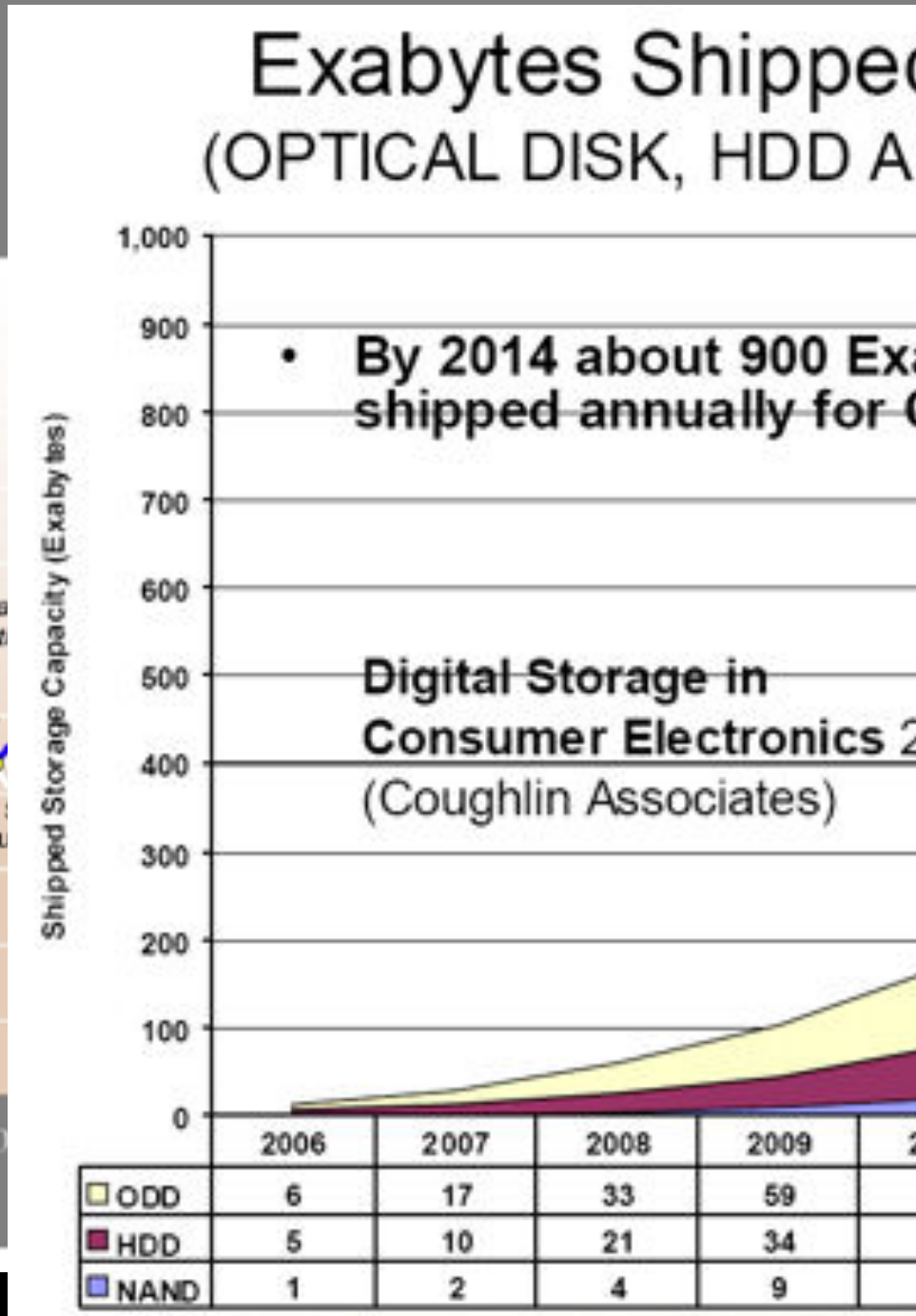


http://www.denali.com/en/images/dmr/20090113_table1.jpg

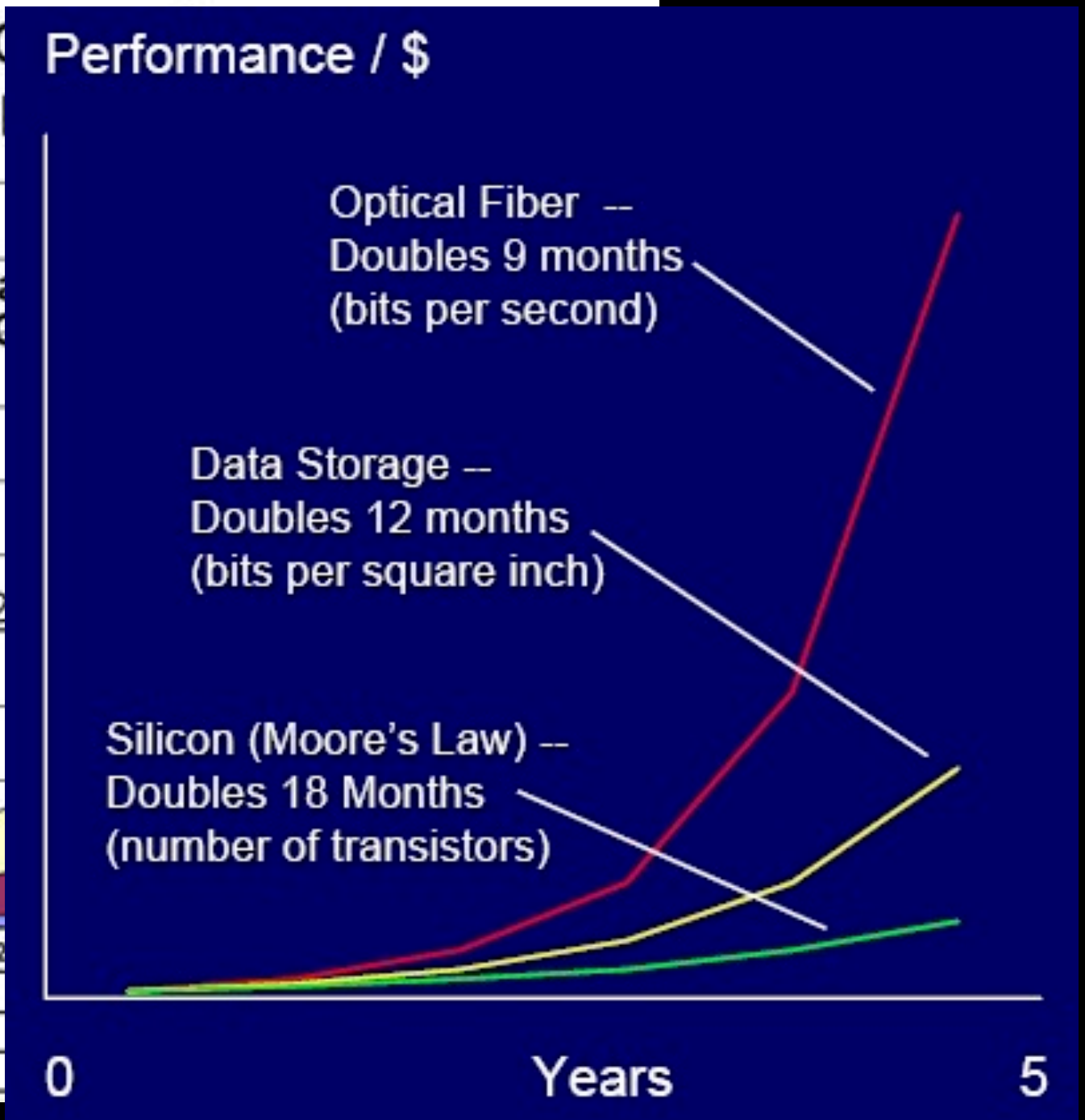
Technology Capability



Source: Ray Kurzweil



http://www.denali.com/en/images/dmr/20090113_table1.jpg



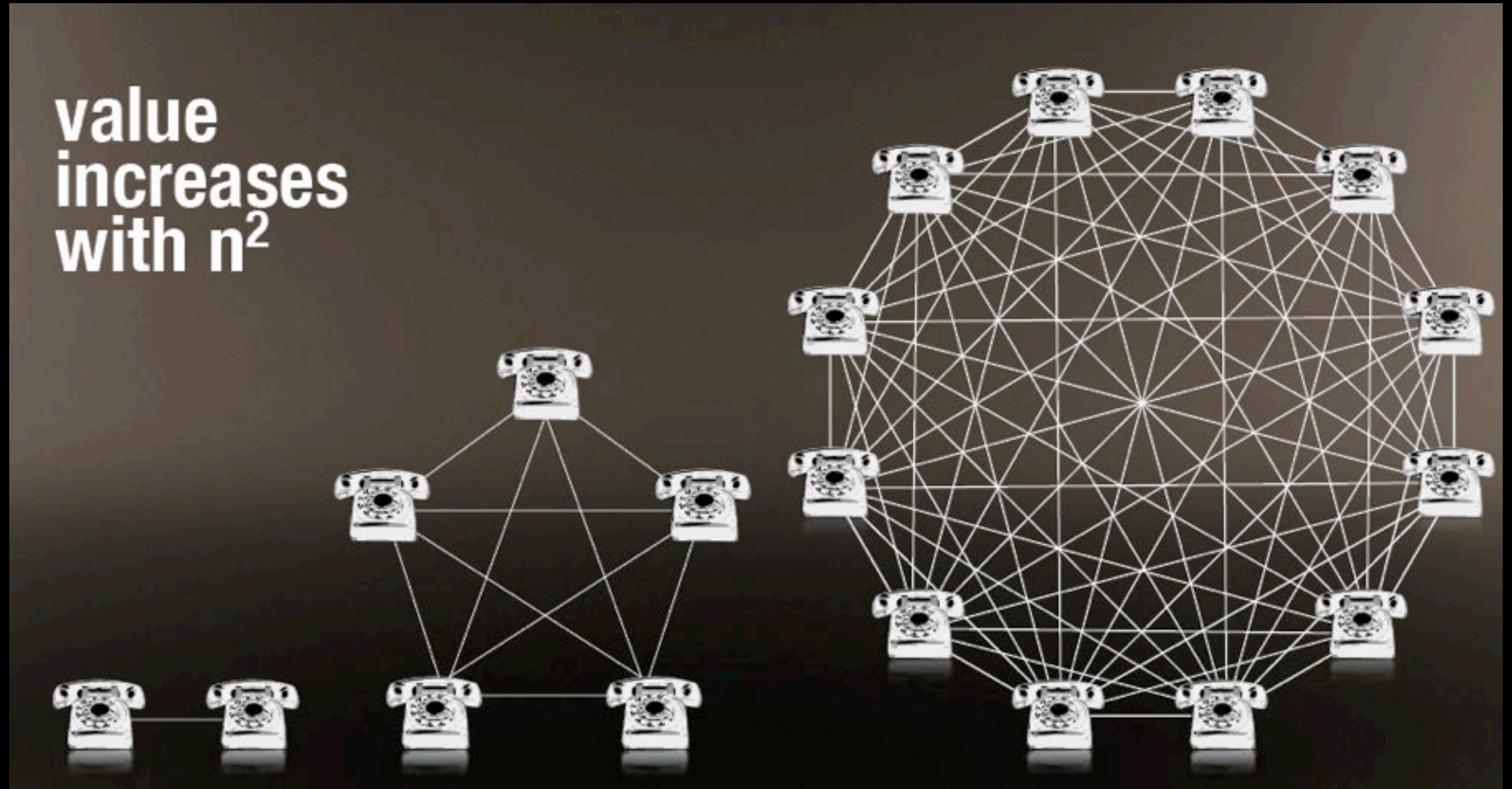
Network Effects - Metcalfe's Law

Applies to
Networks

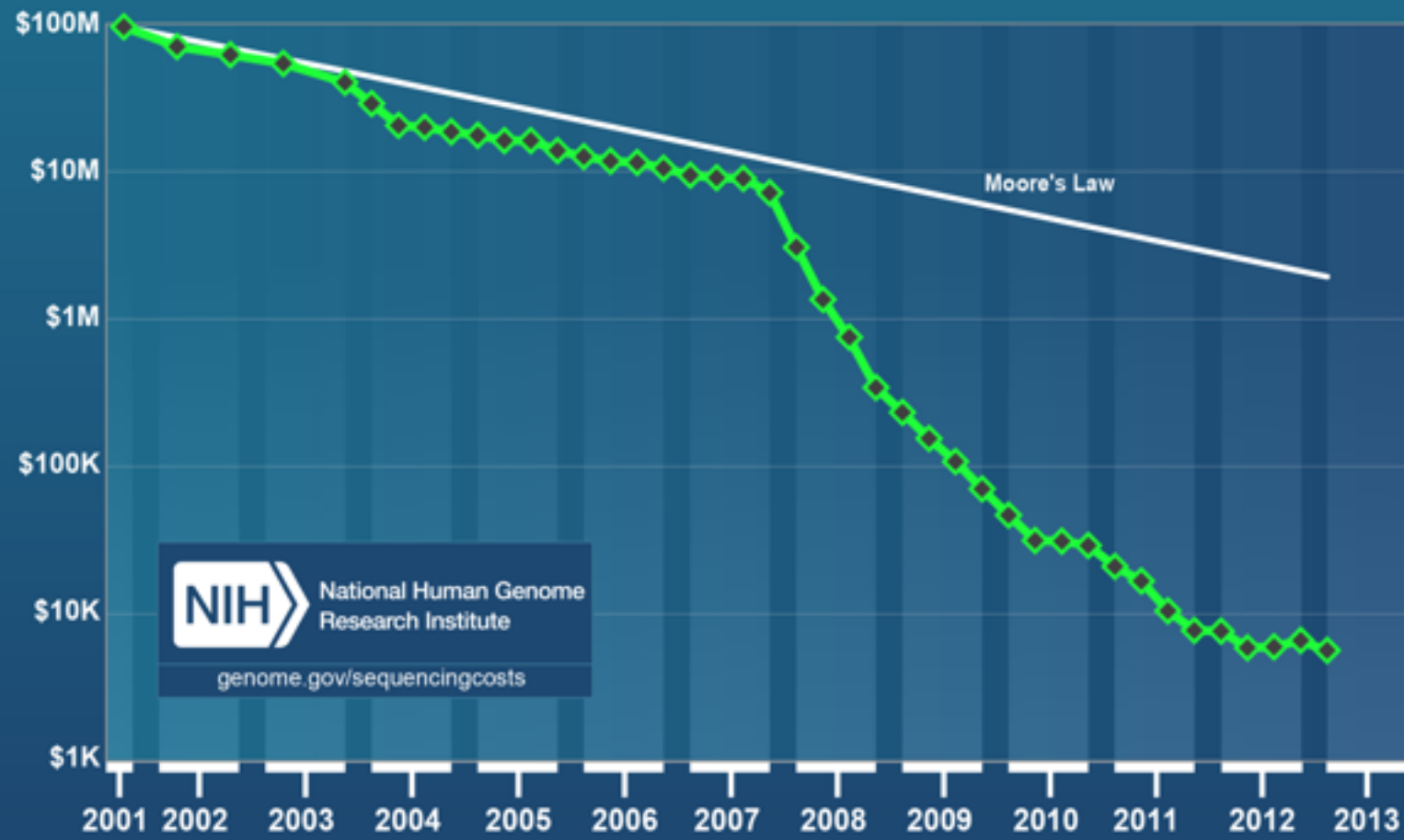
And Social
Media

And Linked
Data

and...



Cost per Genome

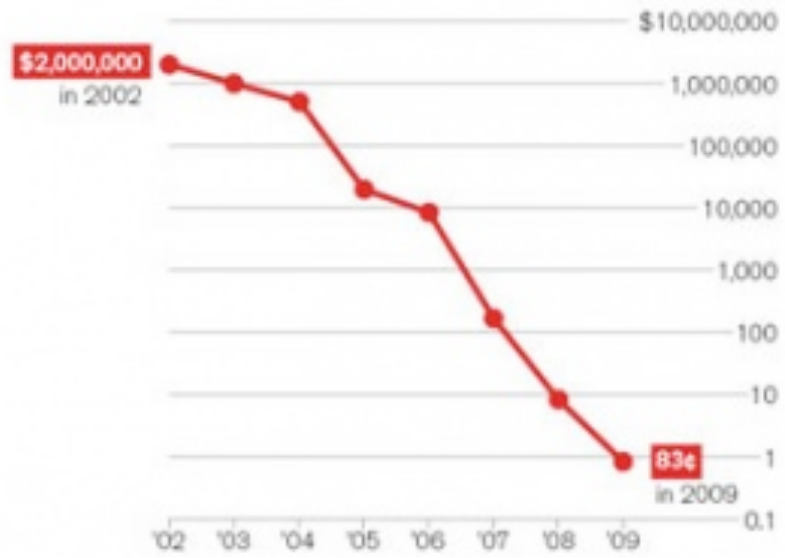


The Ion Proton Sequencer sits pretty at the 2012 International Consumer Electronics Show in Las Vegas. Ethan Miller/Getty Images



SEQUENCING ON THE CHEAP

The cost per million DNA base pairs has plummeted in recent years.



Source: Peter A. Carr and George M. Church, Nature Biotechnology, 2009

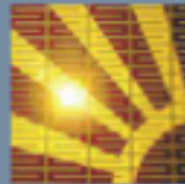
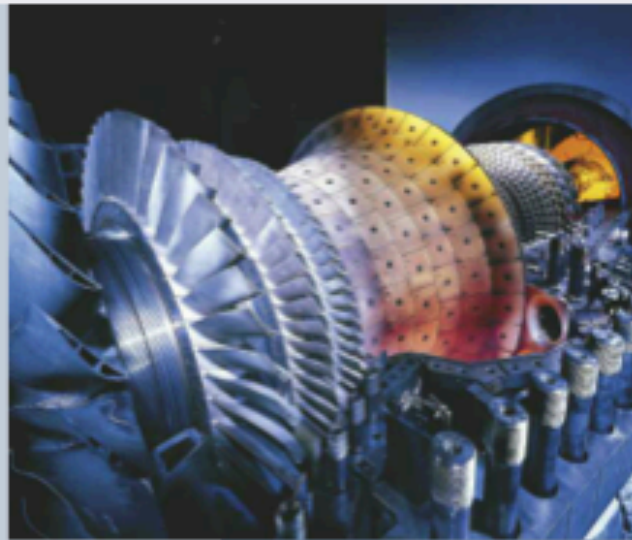
Hessian Ministry of Economy, Transport,
Urban and Regional Development

www.hessen-nanotech.de

HESSEN



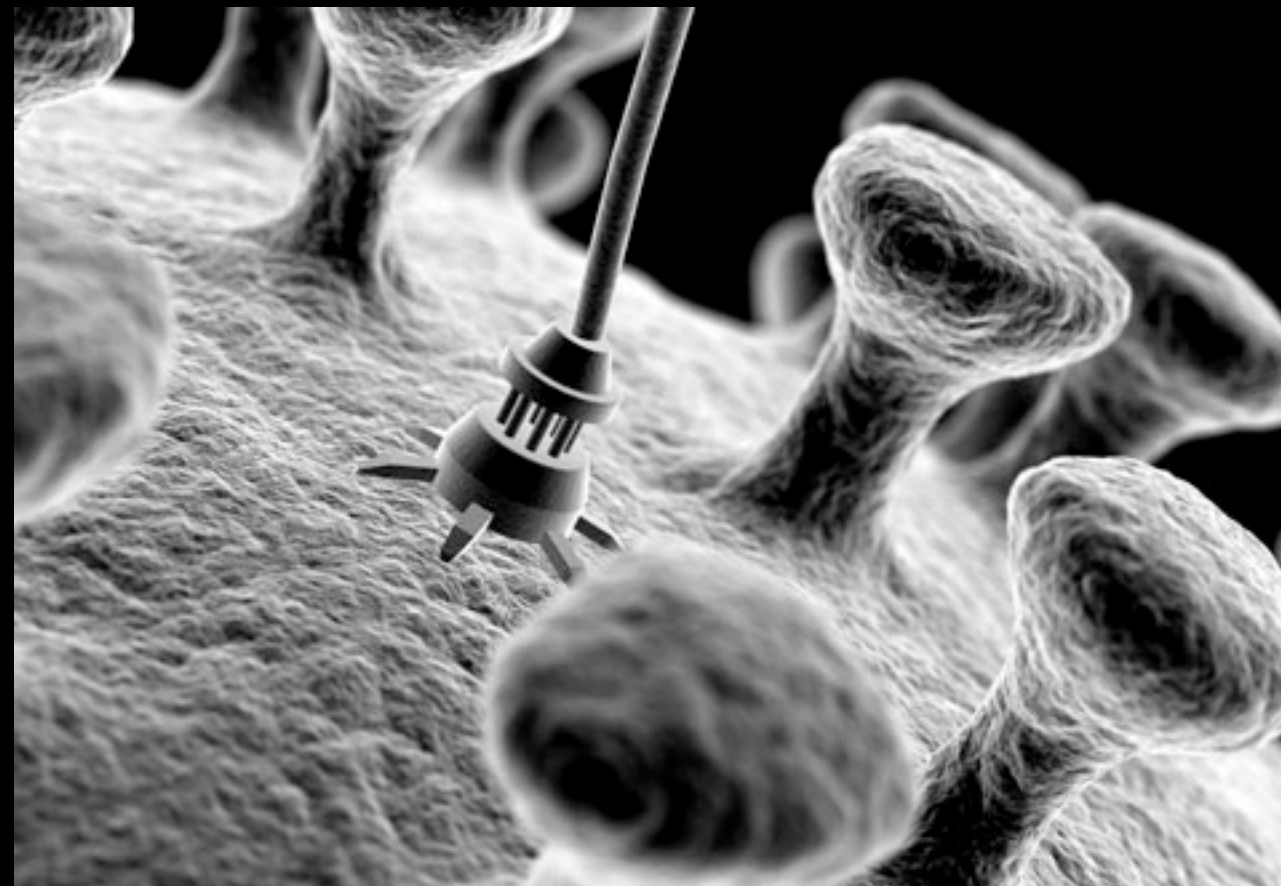
Application of Nano- technologies in the Energy Sector



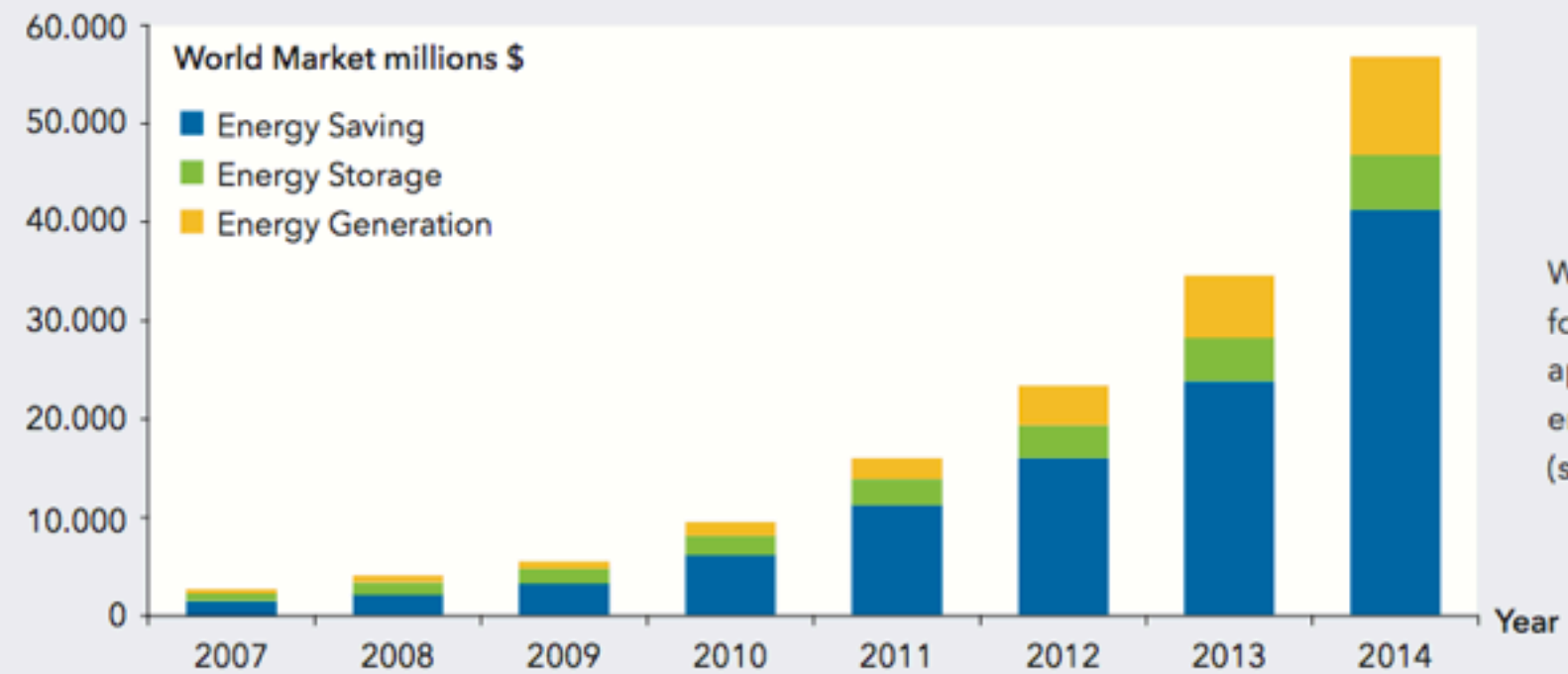
Hessen – there's no way around us.

Hessen

Nanotech



<http://scienceblogs.com/worldsfair/2007/06/25/nanotechnology-from-where-did/>



World market evaluation
for nanotechnology
applications in the
energy sector
(source: Cientifica 2007)

3D Printed Rocket Injector



NASA Test at Marshall Flight Center,
Alabama

Injector produced using laser fusing
of nickel-chromium alloy deposited
by 3D printing

Test was very successful

Only two parts needed to make the
injector - previous technologies
required 115 parts machined
conventionally

<http://mashable.com/2013/08/29/nasa-3d-printed-rocket-test/>

3D Printed Bionics



A cartilagenous ear with embedded silver antenna capable of receiving radio waves

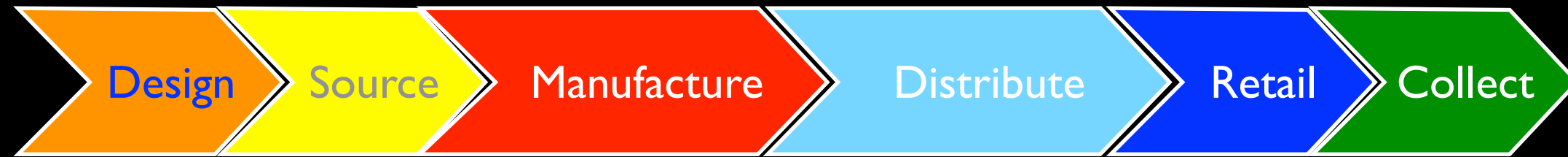
Produced at Princeton

Structure printed on \$1000 3D printer

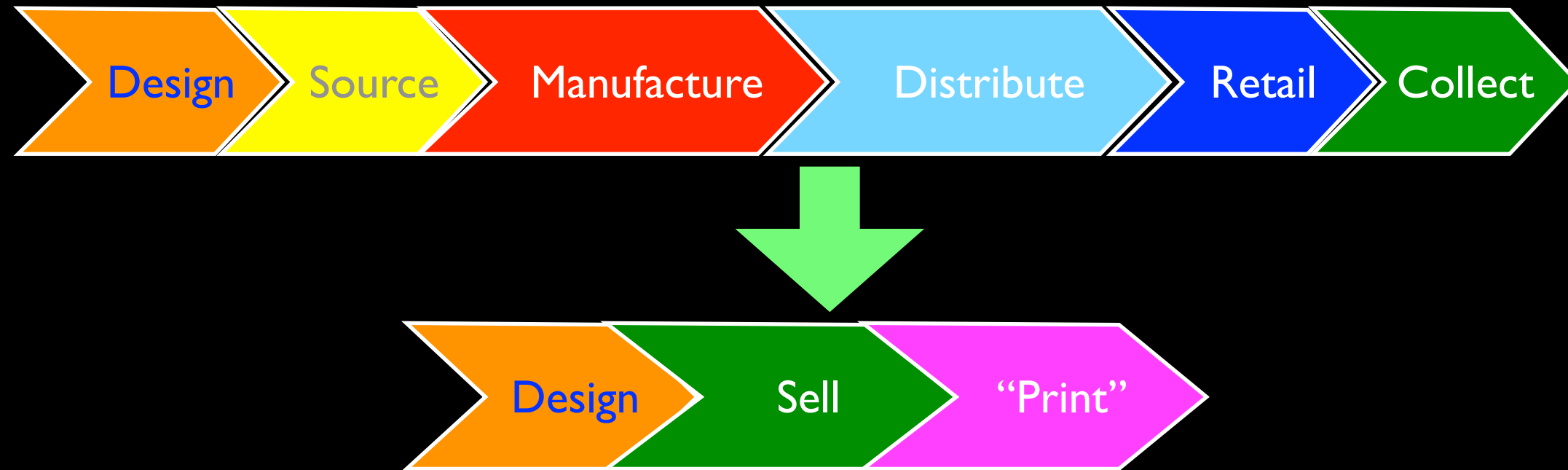
Cells cultured in vitro over 10 weeks to cover

<http://mashable.com/2013/05/24/3d-printed-ear-princeton/>

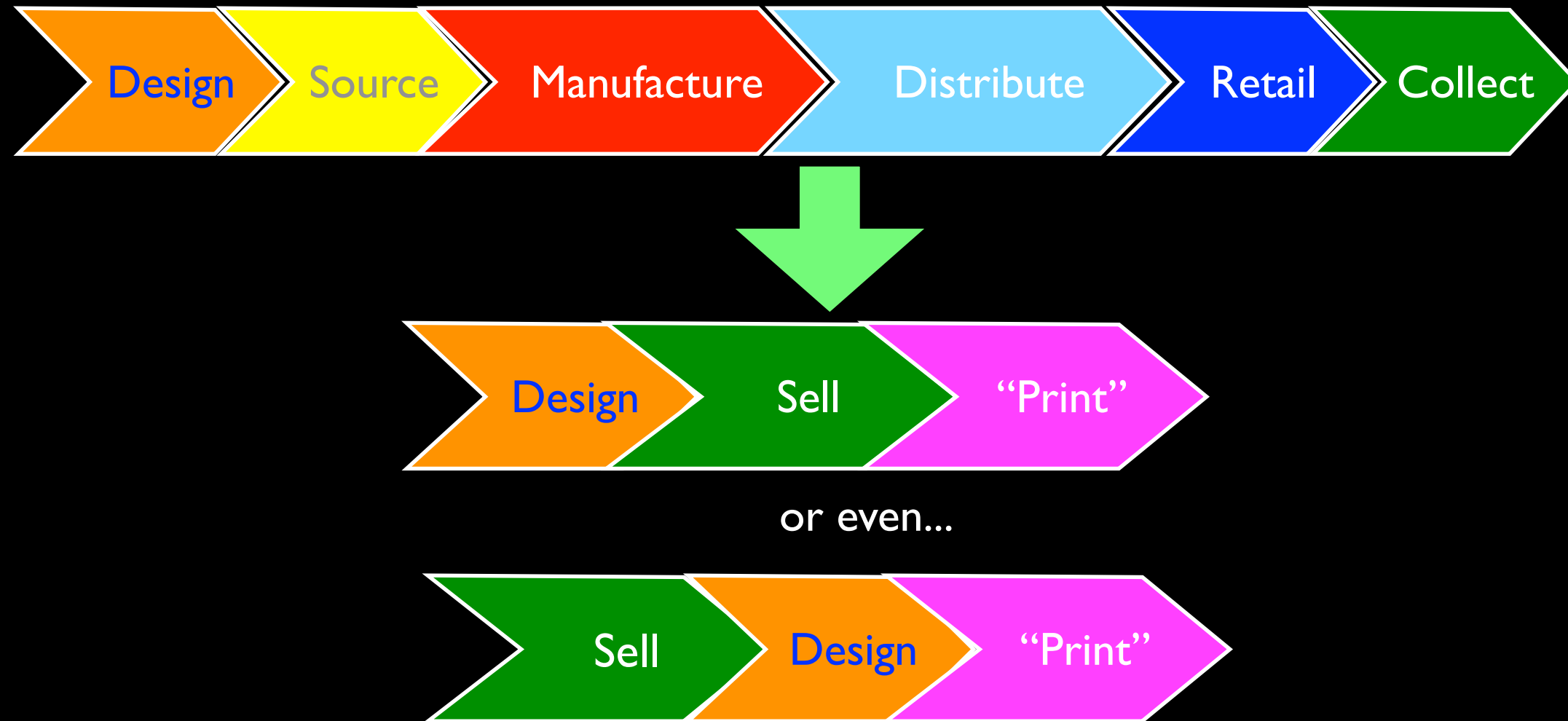
Value Chain Impacts



Value Chain Impacts



Value Chain Impacts



Social Media

Time to 5 Million Viewers/Users

Radio	38 years
TV	13 years
Internet	4 years
iPod	3 years
iPad	2-3 months

Social Media

Time to 5 Million Viewers/Users

Radio	38 years
TV	13 years
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200 Million Users in <1 Year

Scaling Education



“MOOCs”

Coursera

School in the Cloud

Kahn Academy

iTunes U

http://www.ted.com/talks/daphne_koller_what_we_re_learning_from_online_education.html

Internet of Things & Big Data



<http://dev.navigantresearch.com/wordpress/wp-content/uploads/2011/05/Smart-Cities.jpg>

More data generated in last two years than previous recorded history

Most by devices - mobiles, cars, sensors, receivers, cameras..

Massive Data e.g. SKA will generate 9.6×10^{14} bytes (15 Million 64 GB iPods) per day

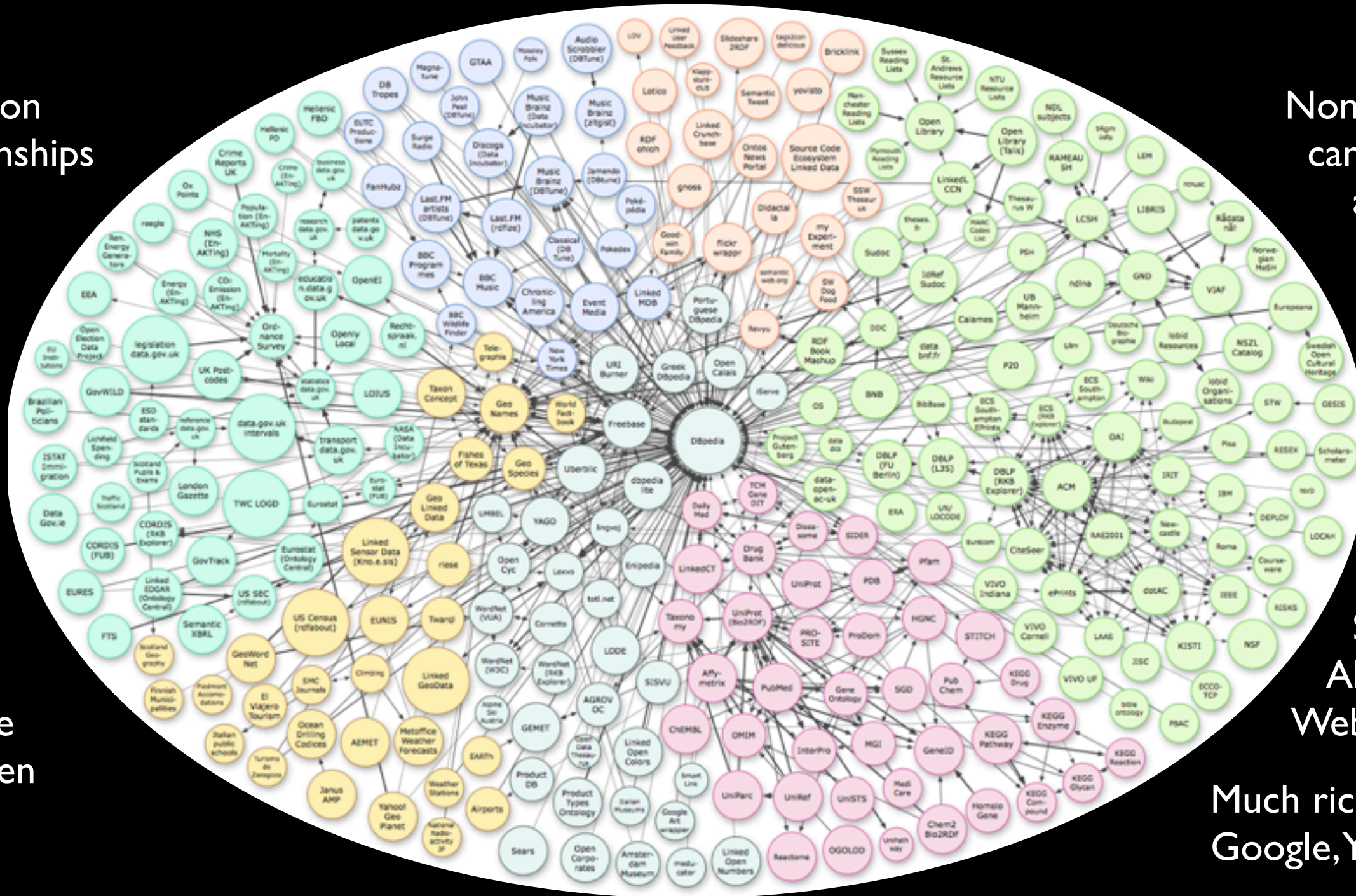
Technologies available to deal with deluge of data - even open source

Semantic Technology & Search

RDF allows definition of facts and relationships in almost English

OWL allows definition of rich Ontologies to organise data

RDFA lets us publish semantic data on the web in human and machine readable form (Open Linked Data)



Non-SQL Databases can store directly and retrieve very quickly

Can merge data from multiple sources very easily

The basis of the Semantic Web Also supports the Web of Things

Much richer search Google, Yahoo, etc. trialing

http://www.phibetaiota.net/wp-content/uploads/2012/12/LOD_Cloud_Diagram_as_of_September_2011.png

Open Data & Visualization

also demonstrates
the wisdom of
crowds

Source: Ted.com

Open Data & Visualization



also demonstrates
the wisdom of
crowds

Source: Ted.com

Robotics gets Real

Big Dog

RoboBees

Arduino

Raspberry Pi

Google Self Drive

SmartBird, Dragonfly

Source: Youtube.com

Clean Labourless Manufacture

Robotics gets Real

Big Dog

RoboBees

Arduino

Raspberry Pi

Google Self Drive

SmartBird, Dragonfly

Clean Labourless Manufacture



Source: Youtube.com

Visualizing Flight Data

Aaron Kobin at TED

Source: Ted.com

Visualizing Flight Data

Aaron Kobin at TED



Source: Ted.com

Visualizing Flight Data

Aaron Kobin at TED



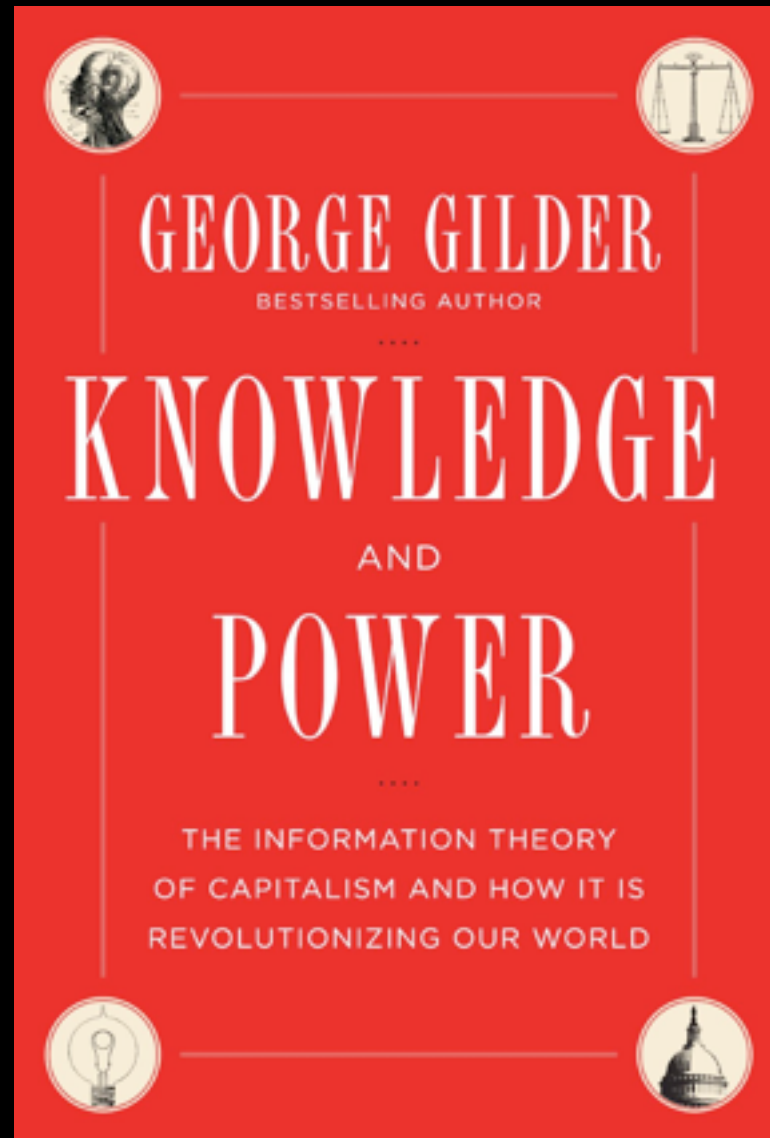
Imagine using
packet switching
algorithms to
optimise traffic

Not impossible with
Google selfdrive

Already being
applied for switching
in power industry

Source: Ted.com

Knowledge and Power



Gilder has been a powerful advocate of free market and technology enablement for many years

Formulated law of increasing bandwidth

New work details the impact of intellectual property, knowledge, network and organization on productivity

Advocate of small government and technology enabled entrepreneurship

Recommended reading!

Applications Potential

Social Networks can be
“mined” via APIs

Automatically generated
data exploding

Public Data Sets Exploding

Semantic Technology allows
automatic merging

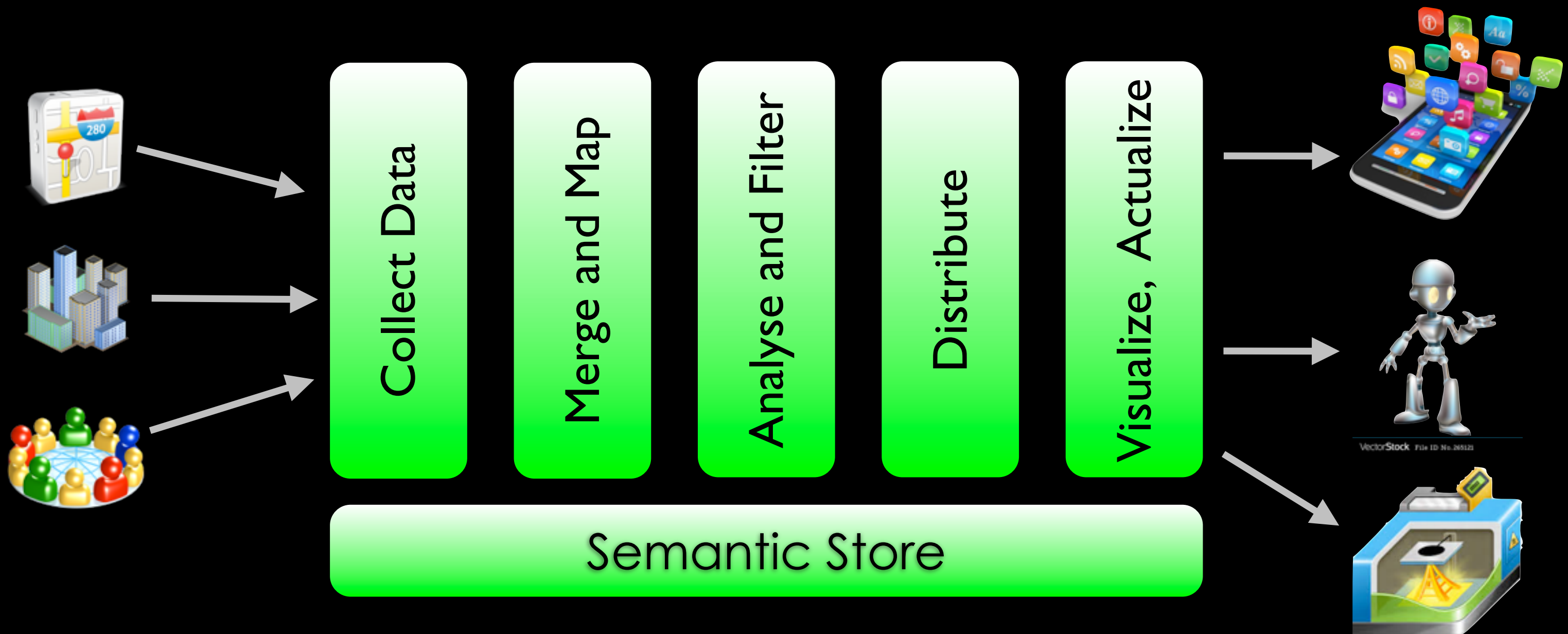
Technologies there to
manage, analyse, visualize,
mash up

Application distribution via
App Stores

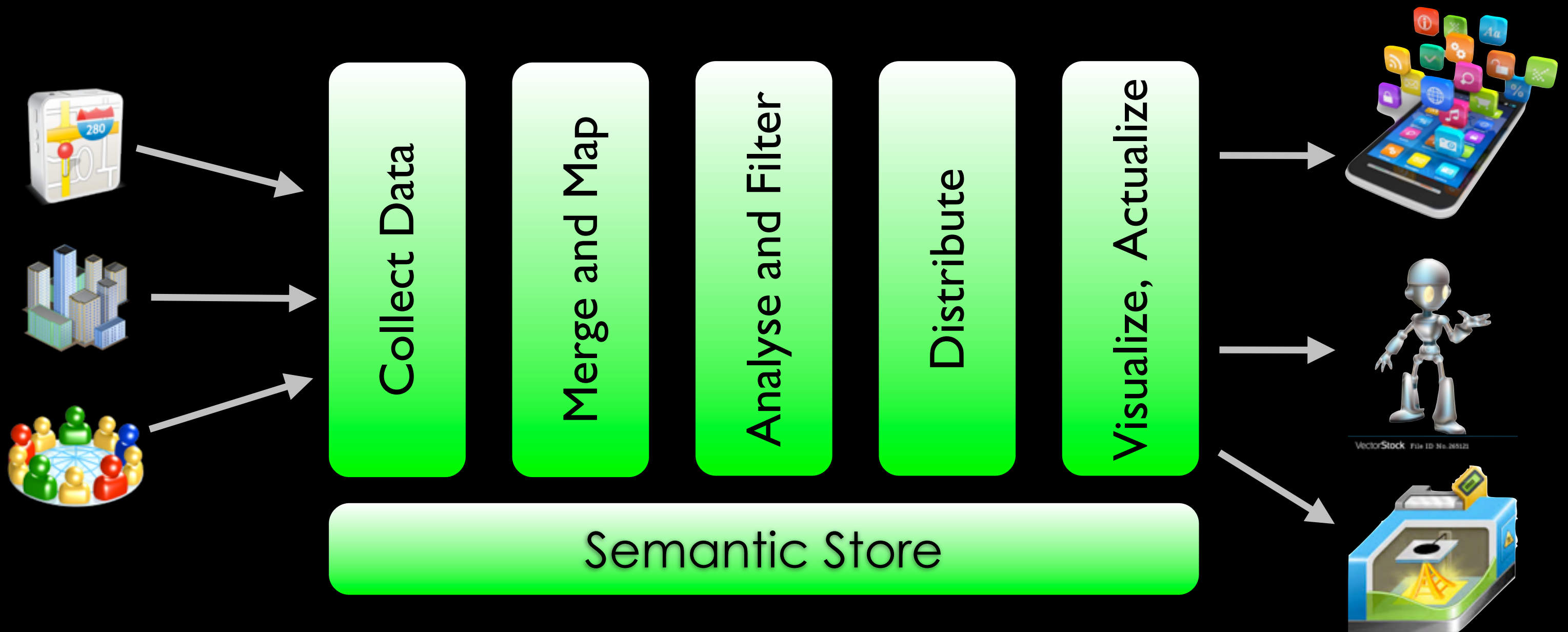
Global reach in hours

Embedded Intelligence

Application Architecture

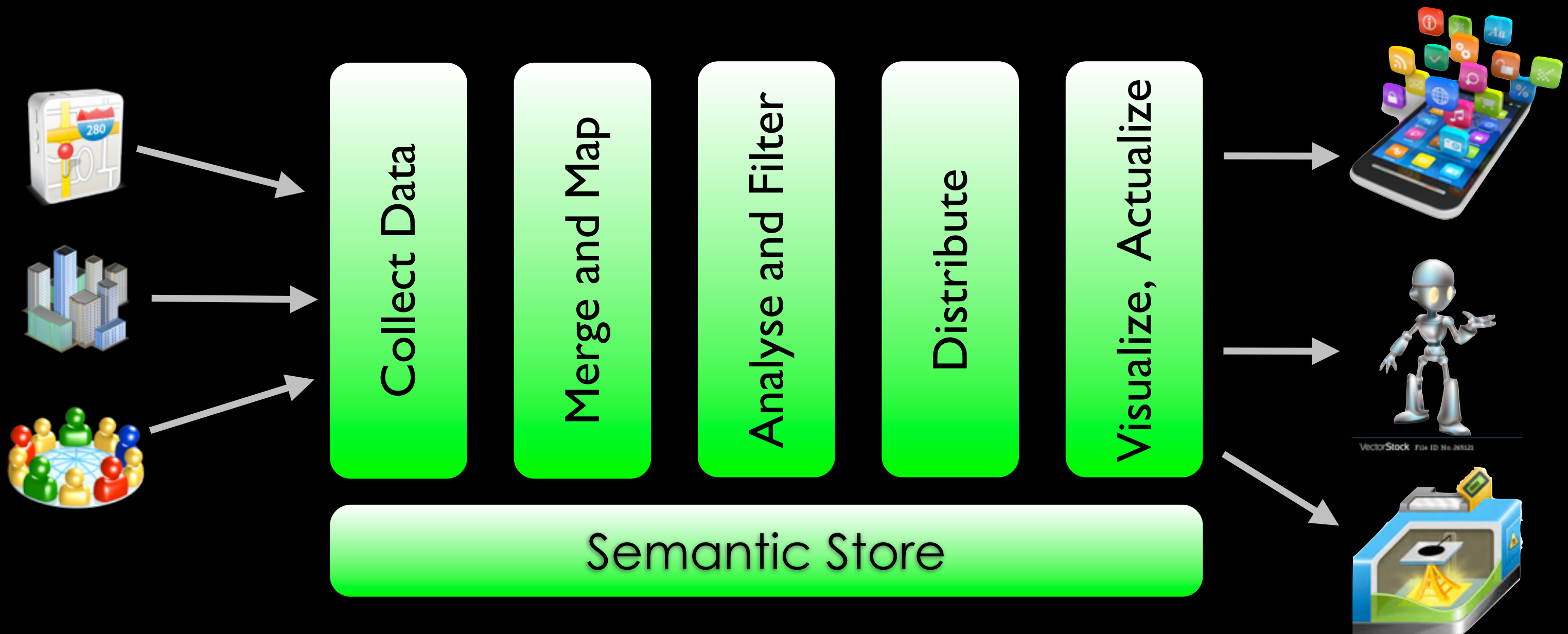


Application Architecture



“World Processing”

Application Architecture



“World Processing”

Platform 3.0 should be an enabler and accelerator

Graham McLeod

 graham@inspired.org

 www.inspired.org

  <http://grahammcleod.typepad.com/>

(blog)

 LinkedIn: Graham McLeod



“The world is moving so fast nowadays that the man who says it can’t be done is generally interrupted by someone doing it!” - *Elbert Hubbard*

Resources

Wired

TED

Mashable

Semanticweb.com

W3C.org

inspired!

Navigant Research

Hessen Ministry of Economy,
Transport, Regional and National
Development (Germany)

National Human Genome
Research Institute (USA)

Ray Kurzweil

Nature

<http://www.pranavmistry.com>