Demographics as Destiny, Meets Technology the Disruptor

Garry Golden

February 15, 2017

Start → *End*

Warm up
Foresight 101

Drivers of Change

Discussion

More or Less Change Ahead?

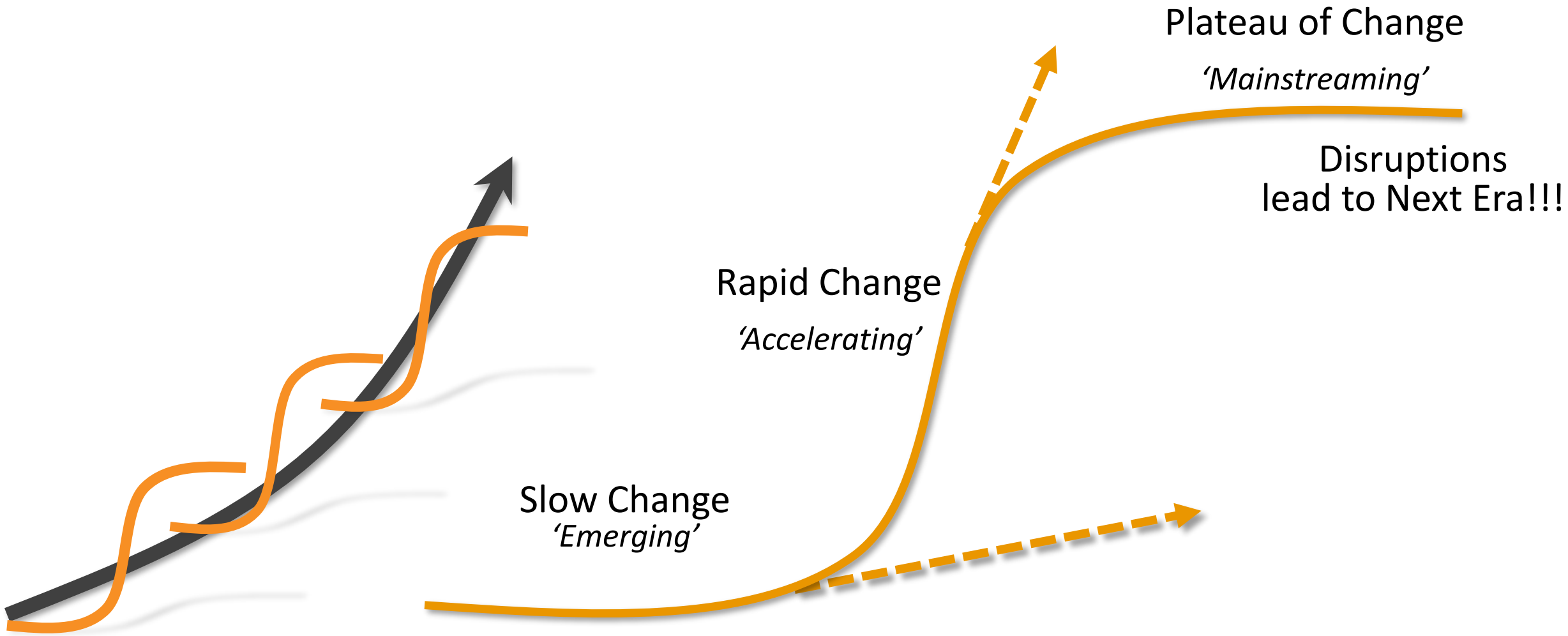
Last ten years

2006 – 2016

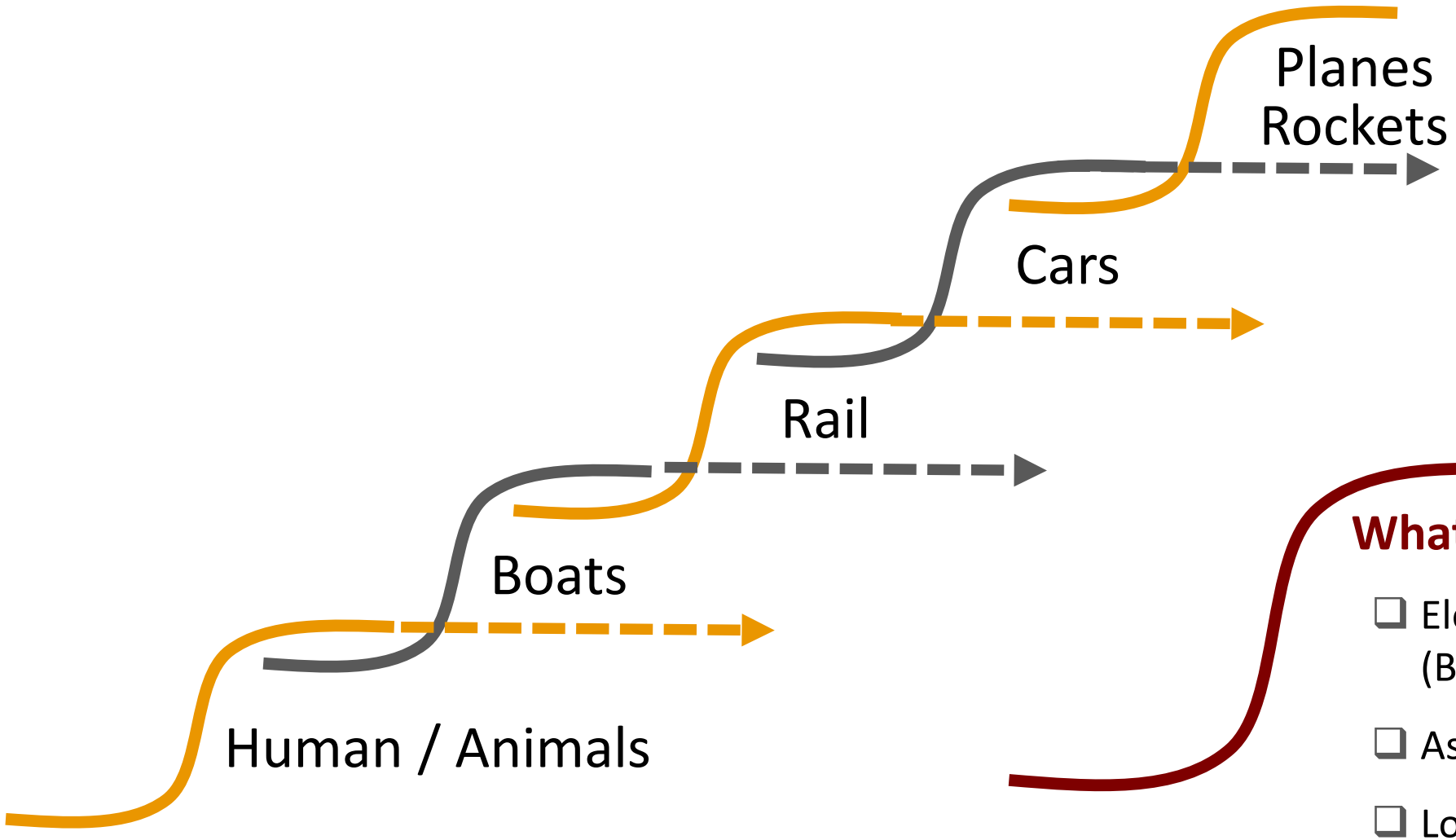
Next ten years

2017-2027

Foresight 101: Era-based Look at Industries + Market Transitions



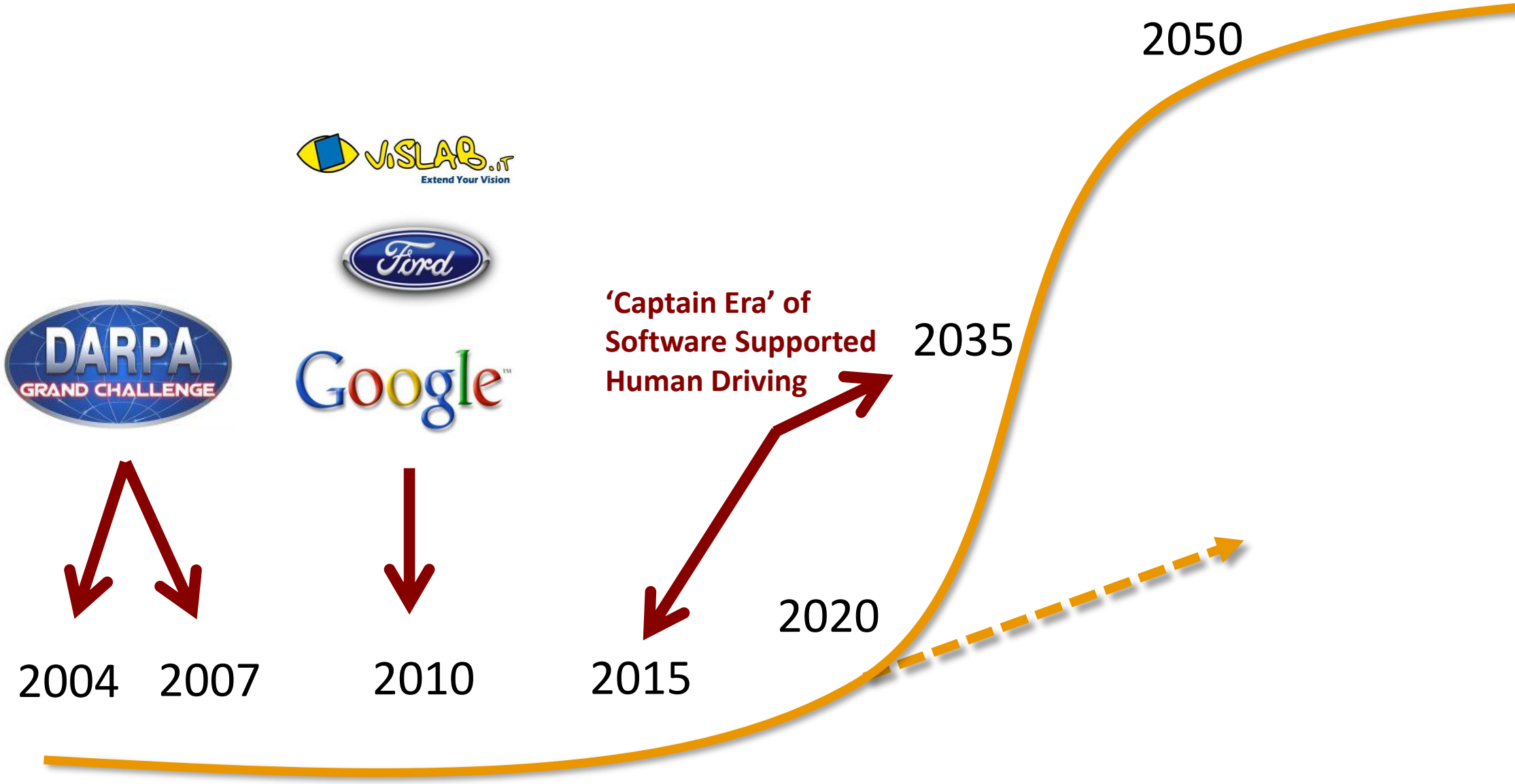
Eras of Mobility



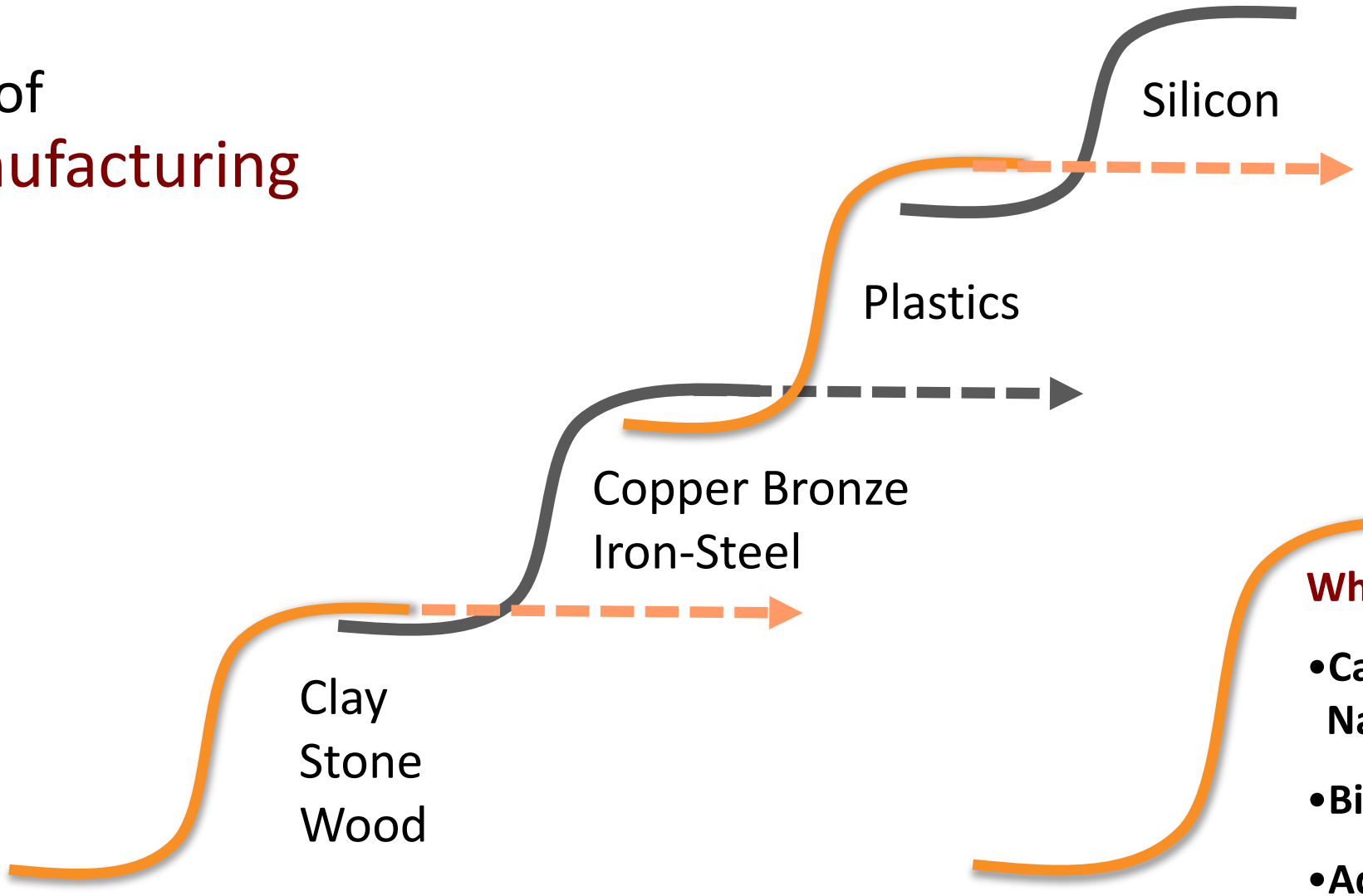
What is next?

- ❑ Electric Vehicles (Battery + Fuel cell)
- ❑ Assistive + Autonomous
- ❑ Low-Volume Production
- ❑ Sub-orbital Space

Monitoring & Anticipating Changes



Eras of Manufacturing

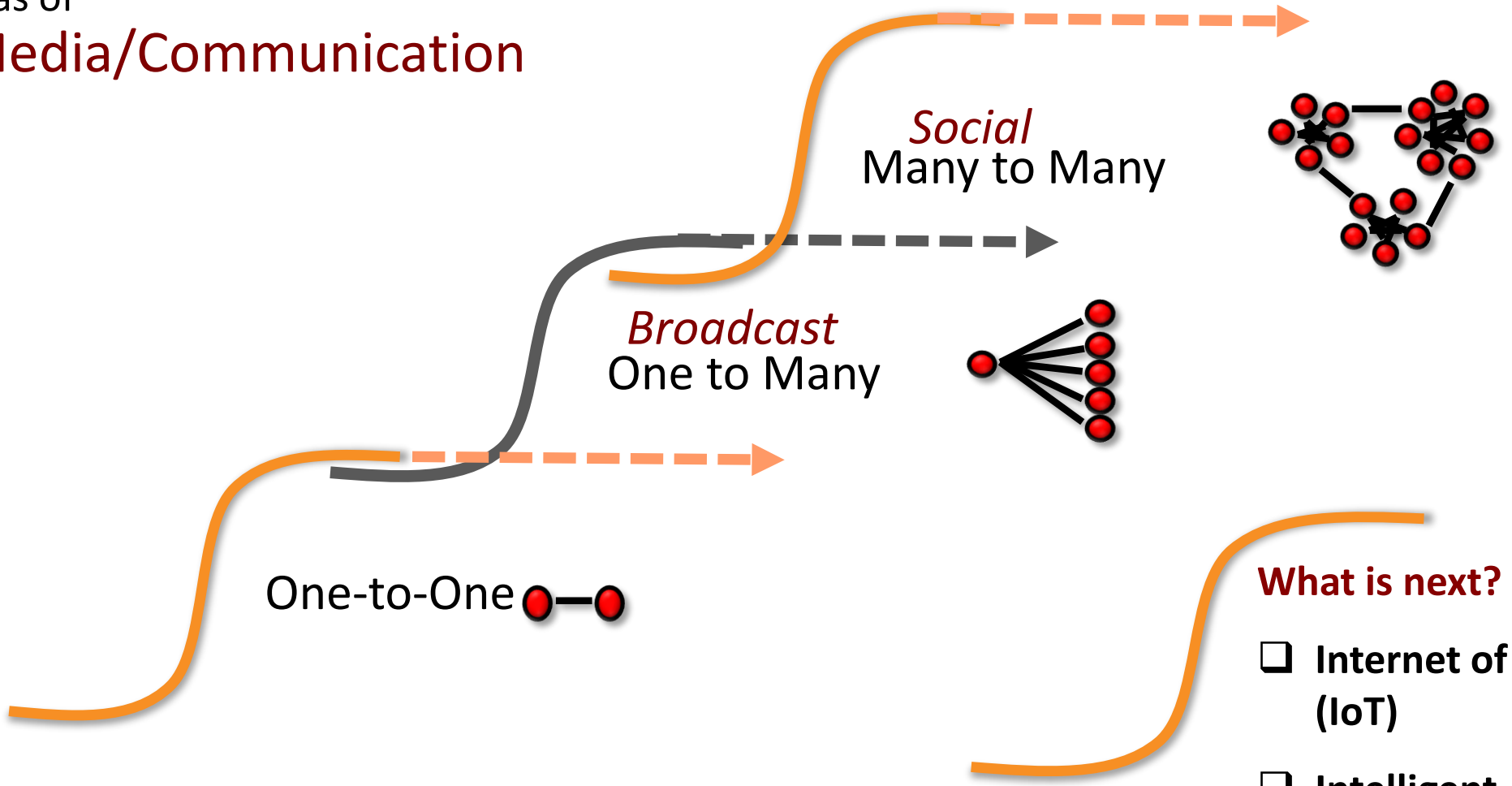


What is next?

- **Carbon-based Nanoscale Materials**
- **Biomaterials**
- **Additive (3D) Printing (Minor Era)**

Eras of

Media/Communication

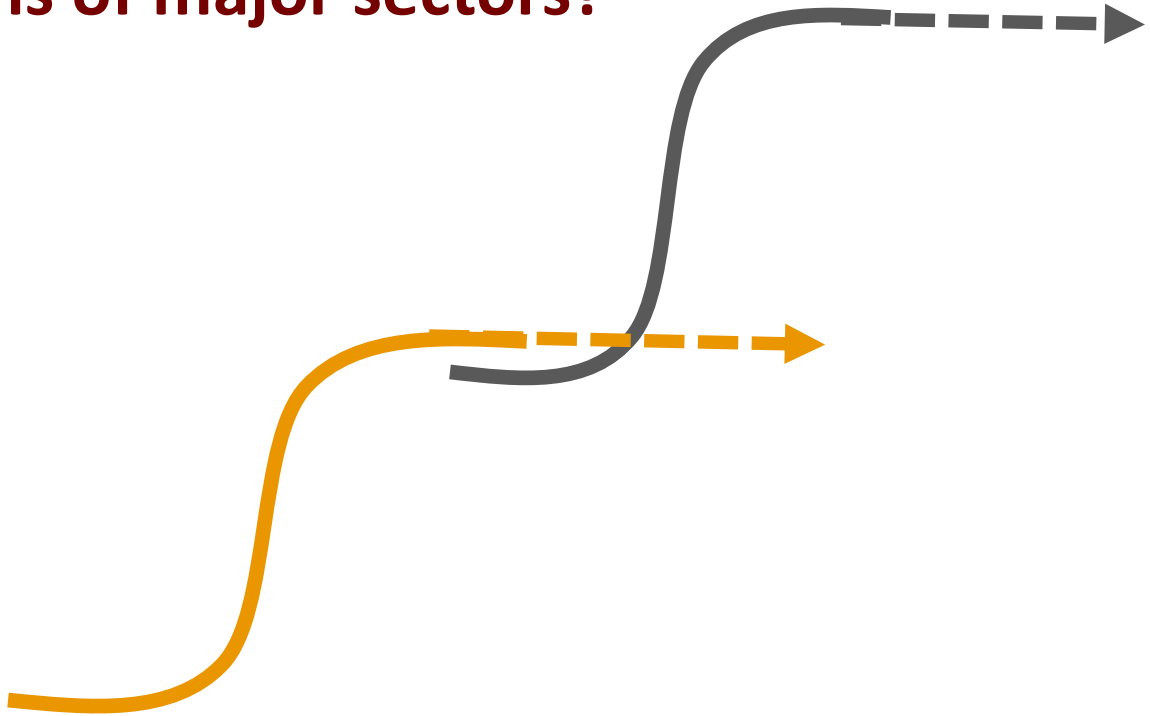


What is next?

- ❑ **Internet of Things (IoT)**
- ❑ **Intelligent Assistants**

How will societies navigate transitions of major sectors?

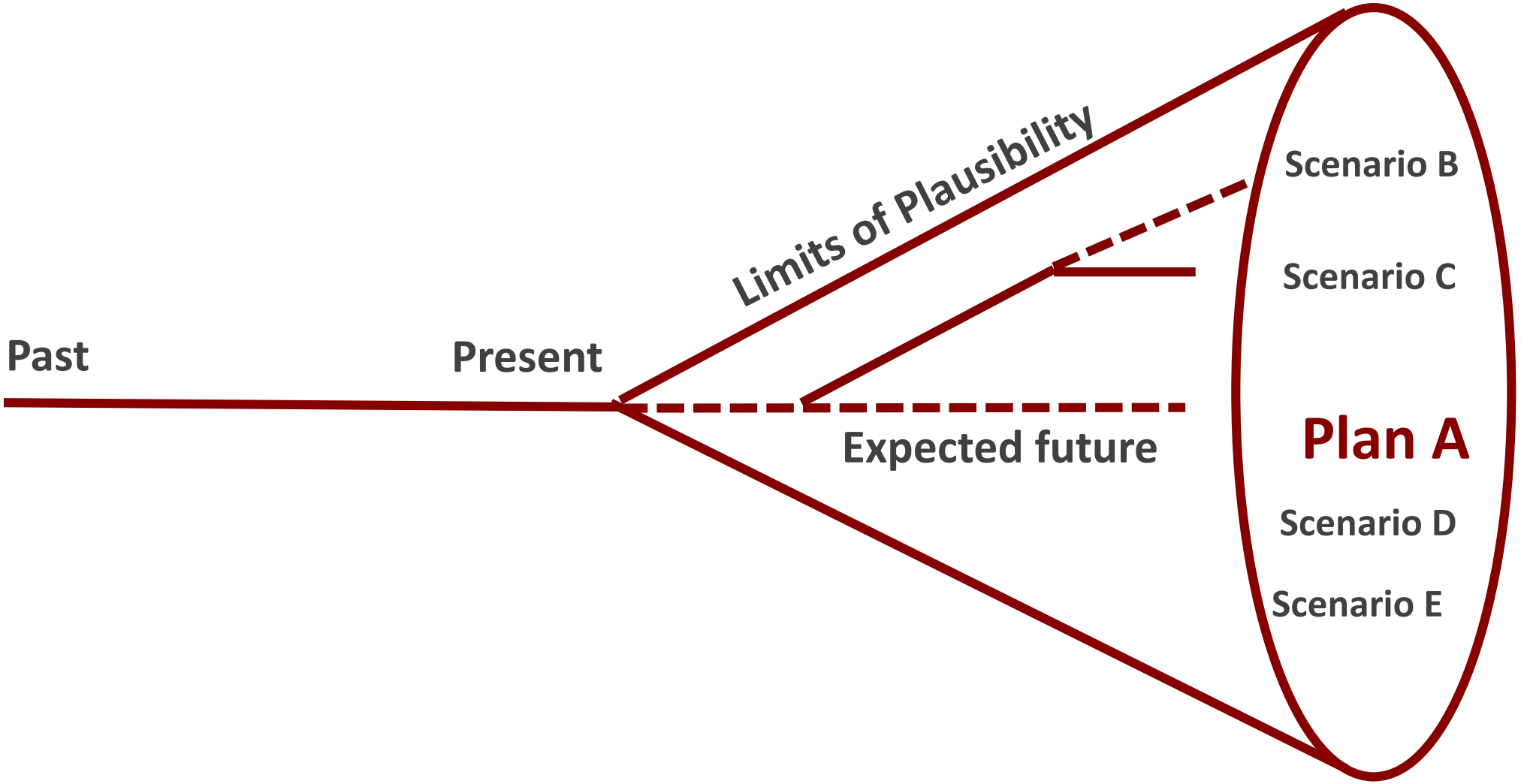
- ❑ Transportation/Mobility
- ❑ Healthcare / Wellness
- ❑ Agriculture / Farming / Food
- ❑ Retail
- ❑ Media / Communication
- ❑ Education / Learning



Tapping My Inner “Futurist”?

Foresight 101: Cone of Plausibility

Multiple Outcomes, Multiple Time Horizons



You will get a great job
right after graduation

Slides Removed

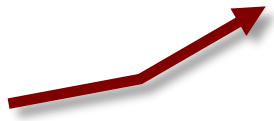
Foresight 101

Every day I make an effort to move toward what I do not understand.

- Cellist, Yo-Yo Ma

Foresight: Three Mechanisms of Change

Trends
(Continuities)



Plausible Future

Forecasts

Events
(Discontinuities)

Possible Futures

Scenarios

Choices
(Discontinuities)

Preferred Future

Visions

Four Futures Thinking

?

Continued Growth

Disciplined - Constrained

Transformed

Decline - Collapse

* Jim Dator, University of Hawaii

Always be able to imagine the *Four Futures of* … ?

Continued Growth

Disciplined - Constrained

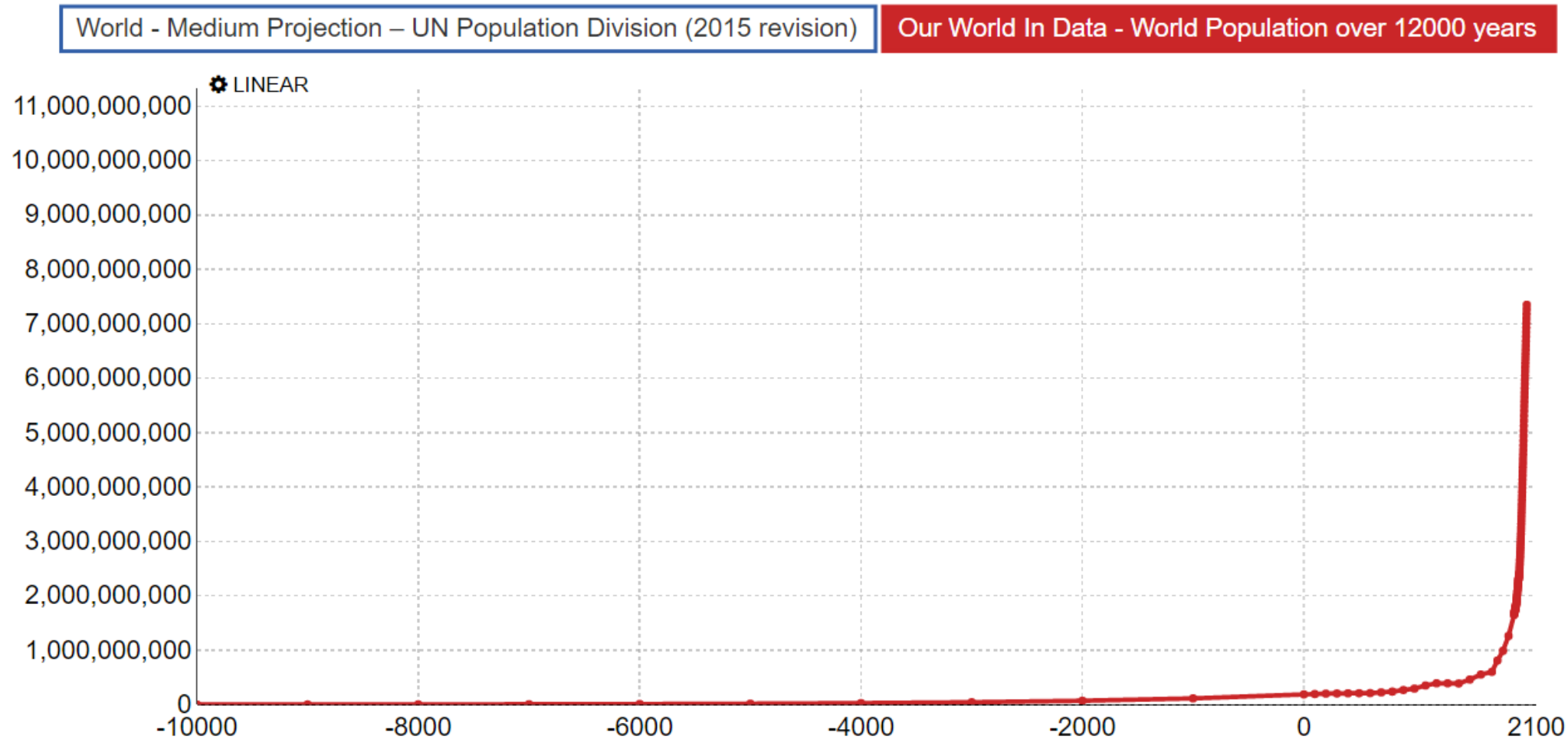
Transformed

Decline - Collapse

* Jim Dator, University of Hawaii

World Population over the last 12,000 years and UN projection until 2100

Our World in Data



Data source: World Population over 12000 years (various sources), Medium Projection – UN Population Division (2015 revision)

OurWorldInData.org/world-population-growth/ • CC BY-SA

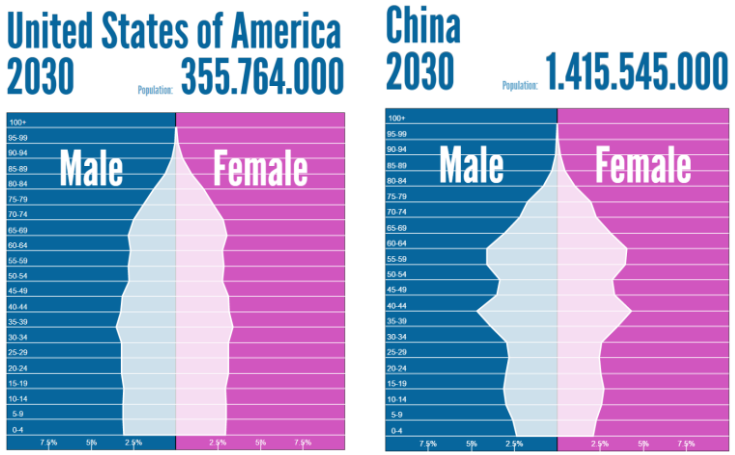
End

Warm up
Foresight 101

Drivers of Change

Foresight Culture

Global Drivers of Change 2017 – 2050

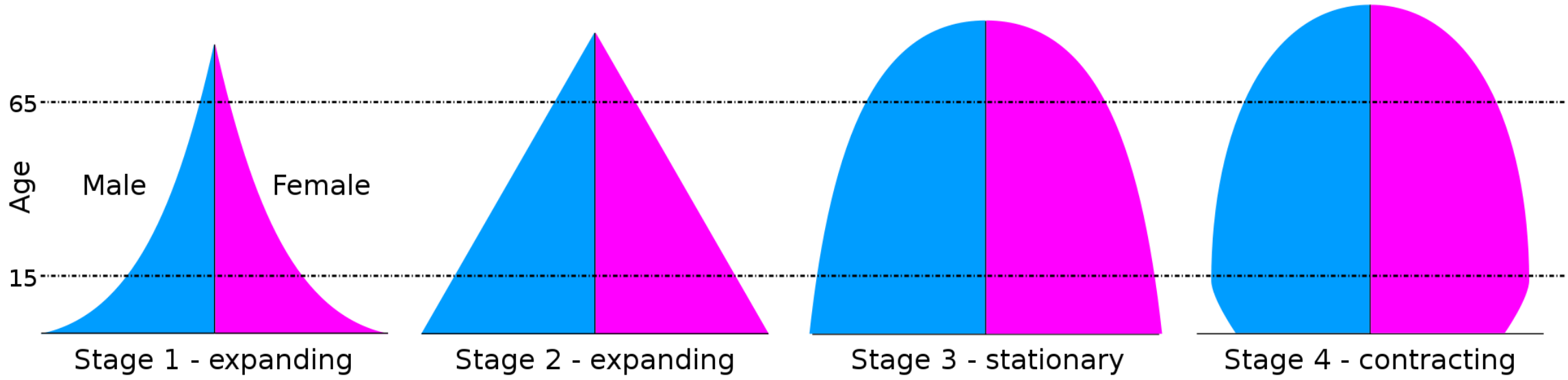


Demographic Destinies

Working with Intelligent Systems

Blockchain & Smart Contracts for Trusted Transactions

Globalization Reshaped by Demographic Realities



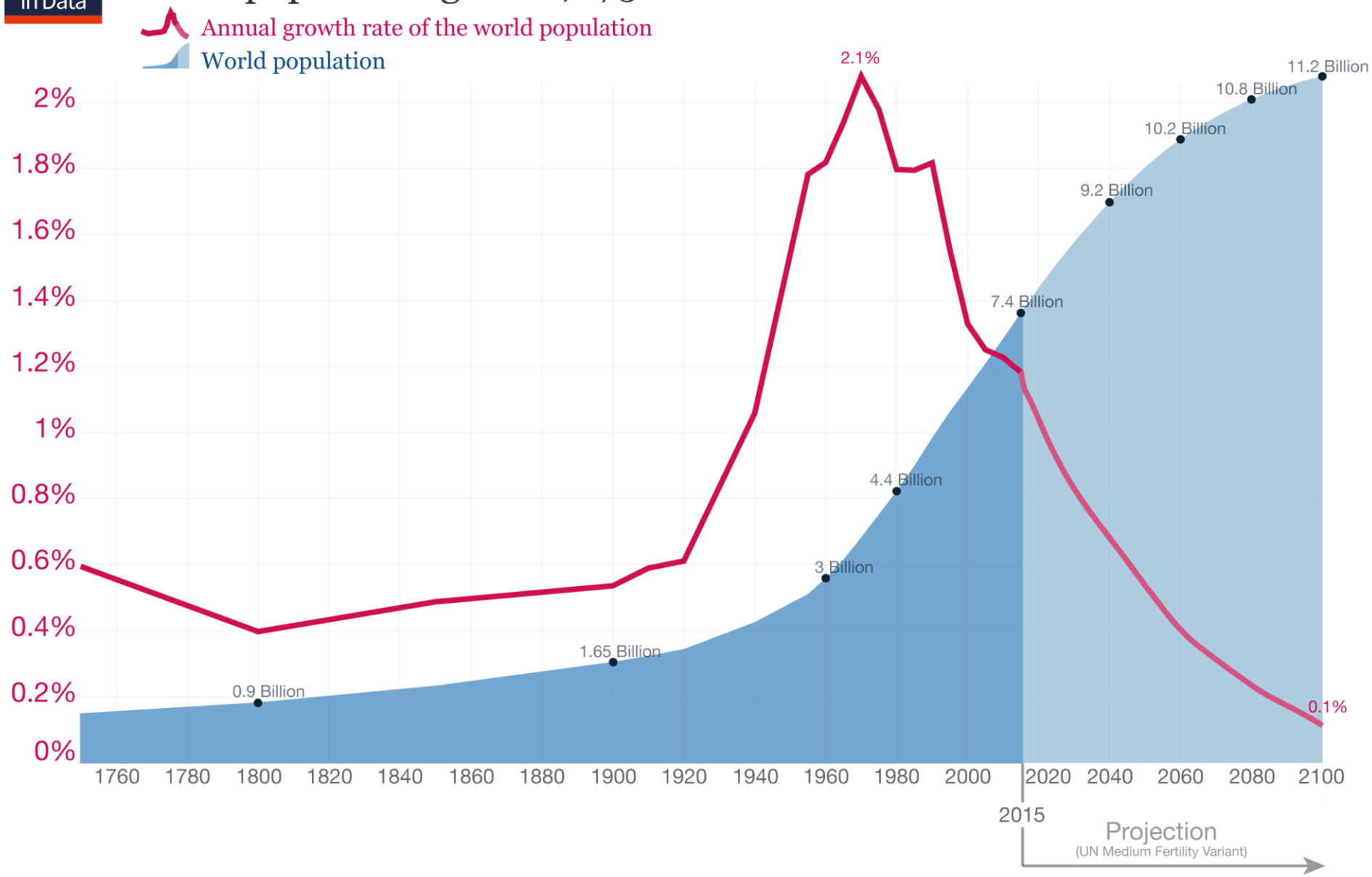
Rural vs Urban
Industry Make-up

Labor Markets
Infrastructure Spending

Education and Skilled Labor
Electorate Sentiment

Our World in Data

World population growth, 1750-2100

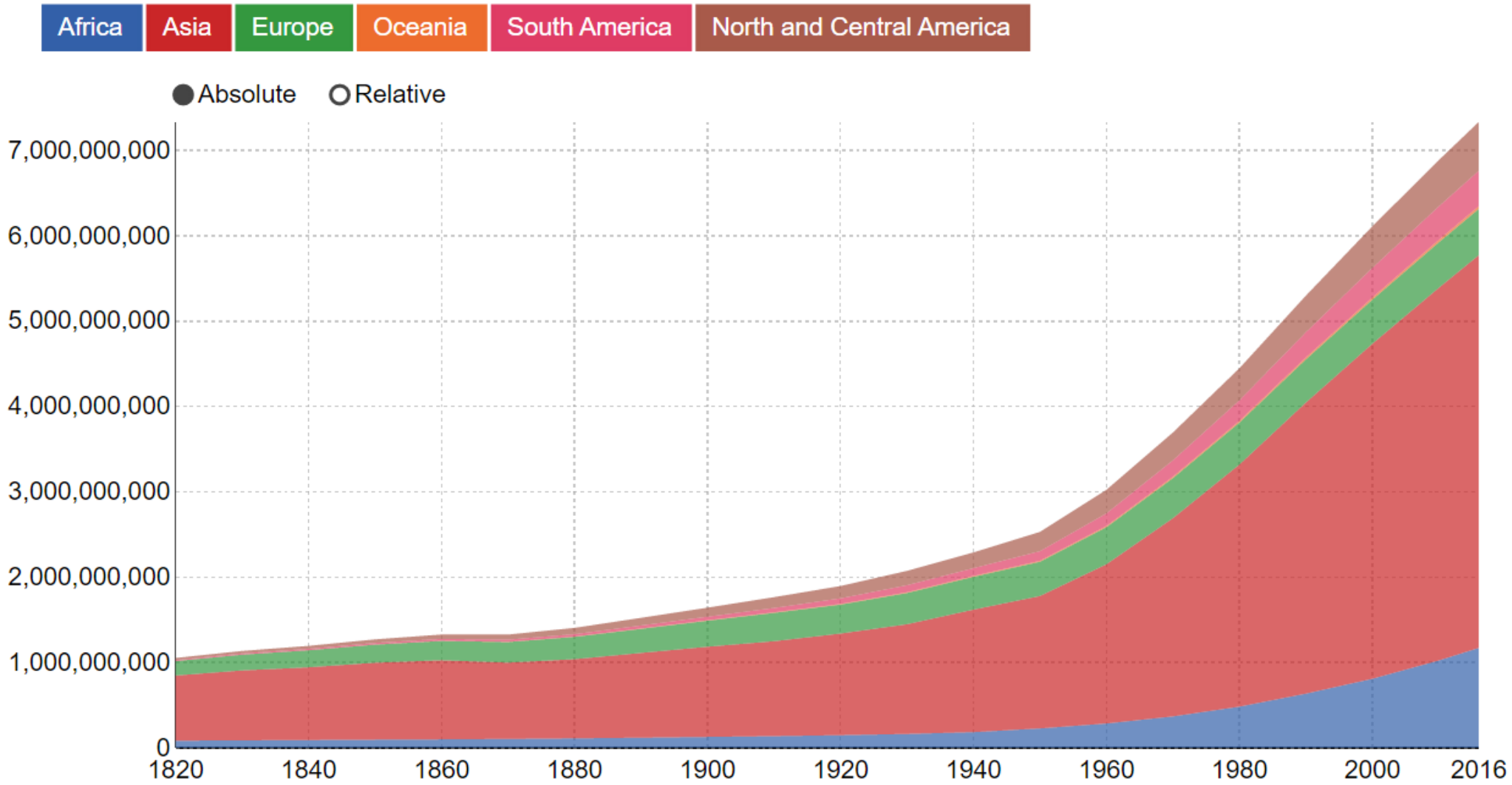


Data sources: Up to 2015 OurWorldInData series based on UN and HYDE. Projections for 2015 to 2100: UN Population Division (2015) – Medium Variant.
The data visualization is taken from OurWorldinData.org. There you find the raw data and more visualizations on this topic.

Licensed under CC-BY-SA by the author Max Roser.

World population by world regions, 1820 to 2016

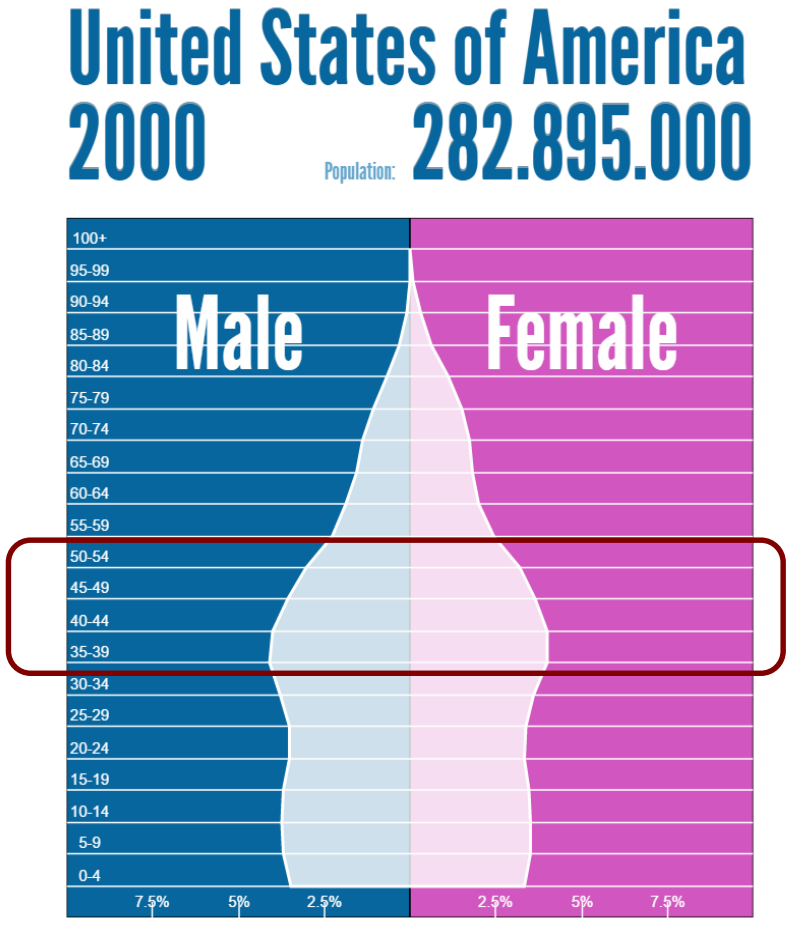
Our World in Data

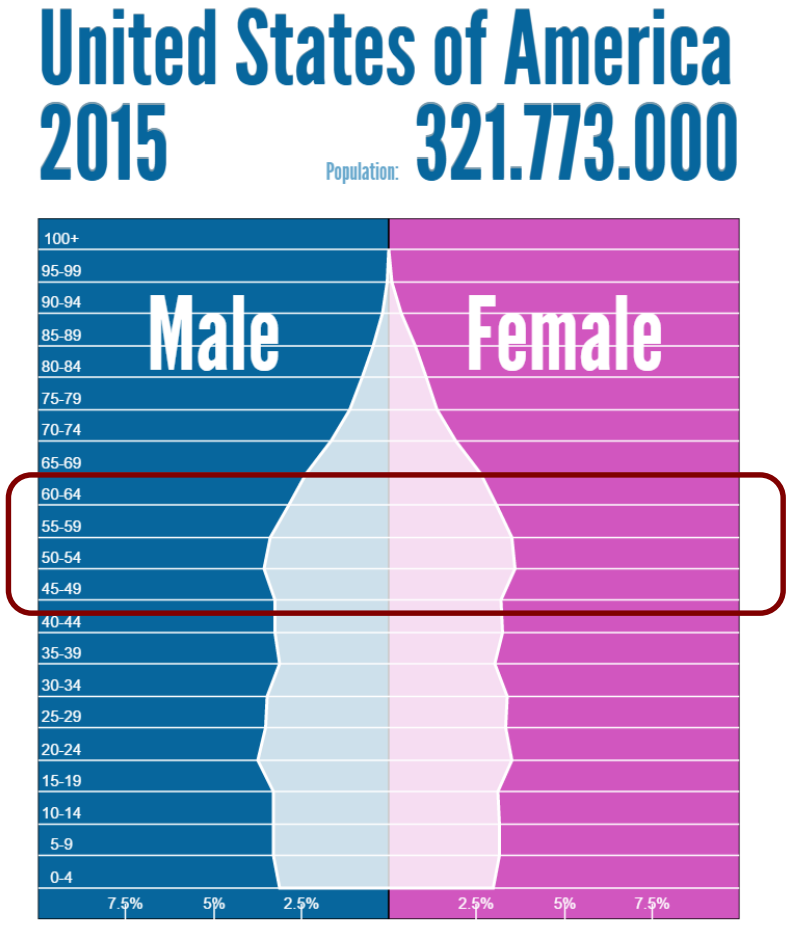


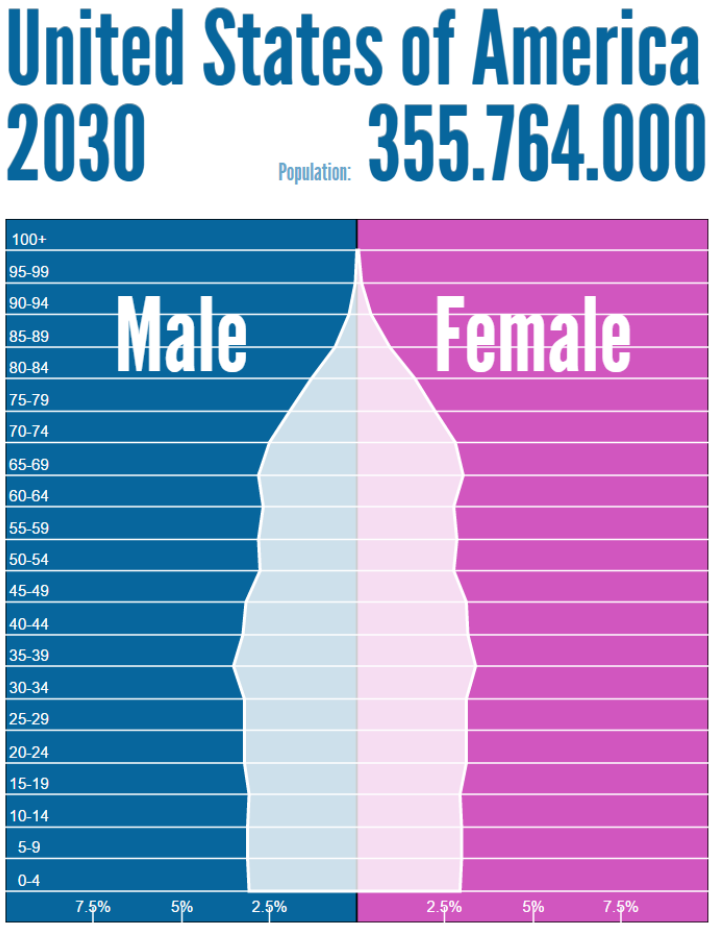
Data source: HYDE Global Population by Region

OurWorldInData.org/world-population-growth/ • CC BY-SA

U.S. = Aging Boomers + Fading *Demographic Dividend*







Source: populationpyramid.net

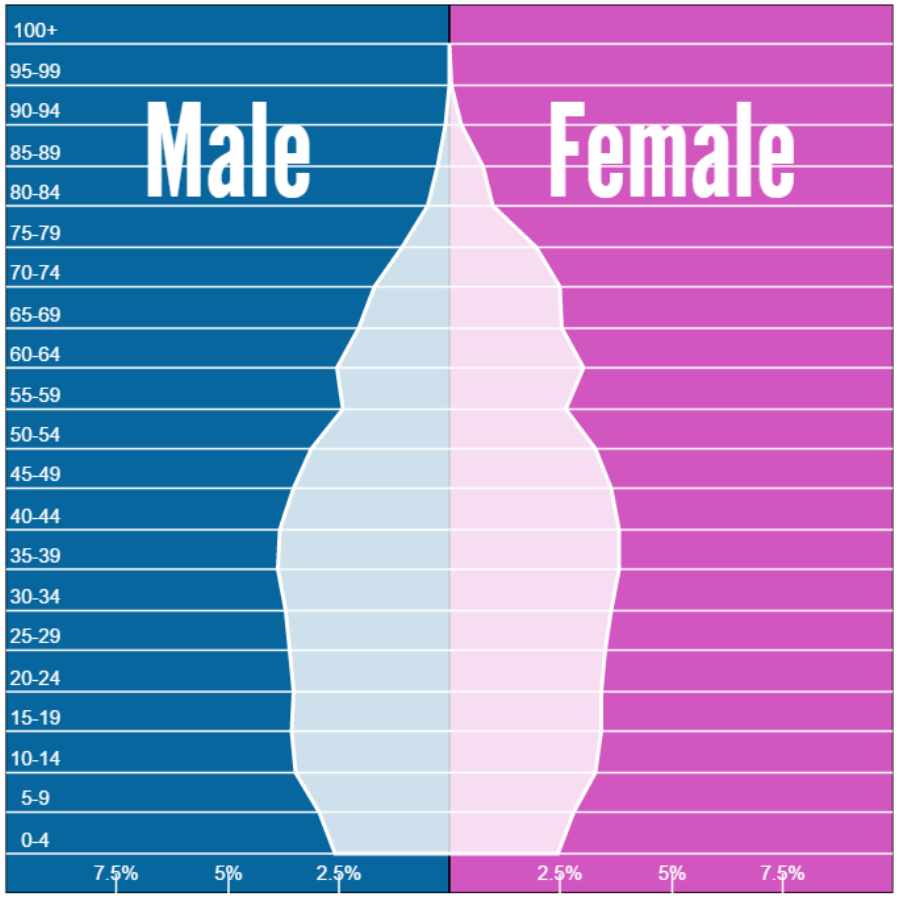
Rural = Aging
Metro = Young

Reddit user [atrubetskoy]

Europe’s Demographic Liability

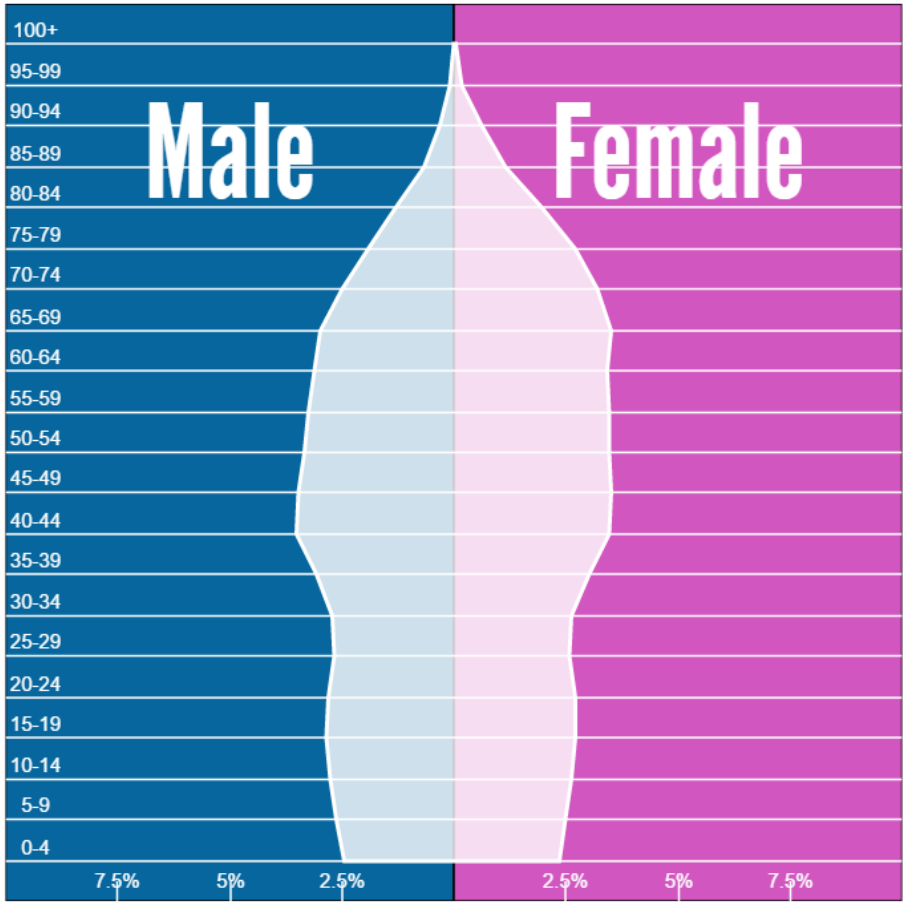
EUROPE 2000

Population: 726.407.000



EUROPE 2030

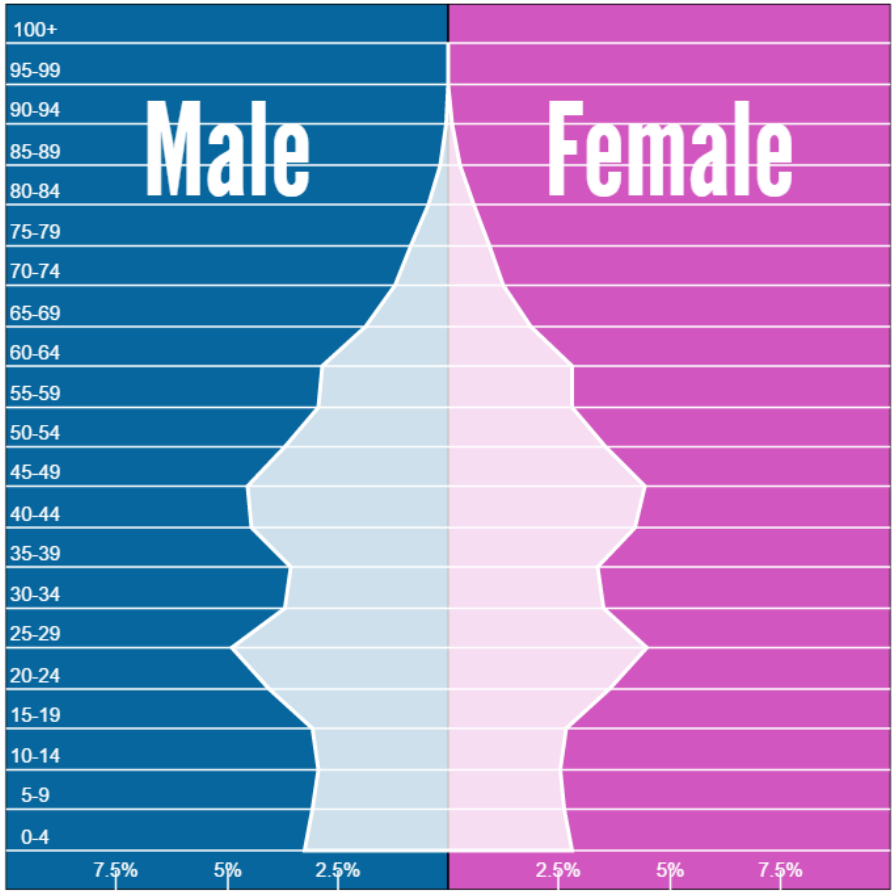
Population: 733.929.000



Global Challenges: Workforce Constraints + Delayed Consumerization

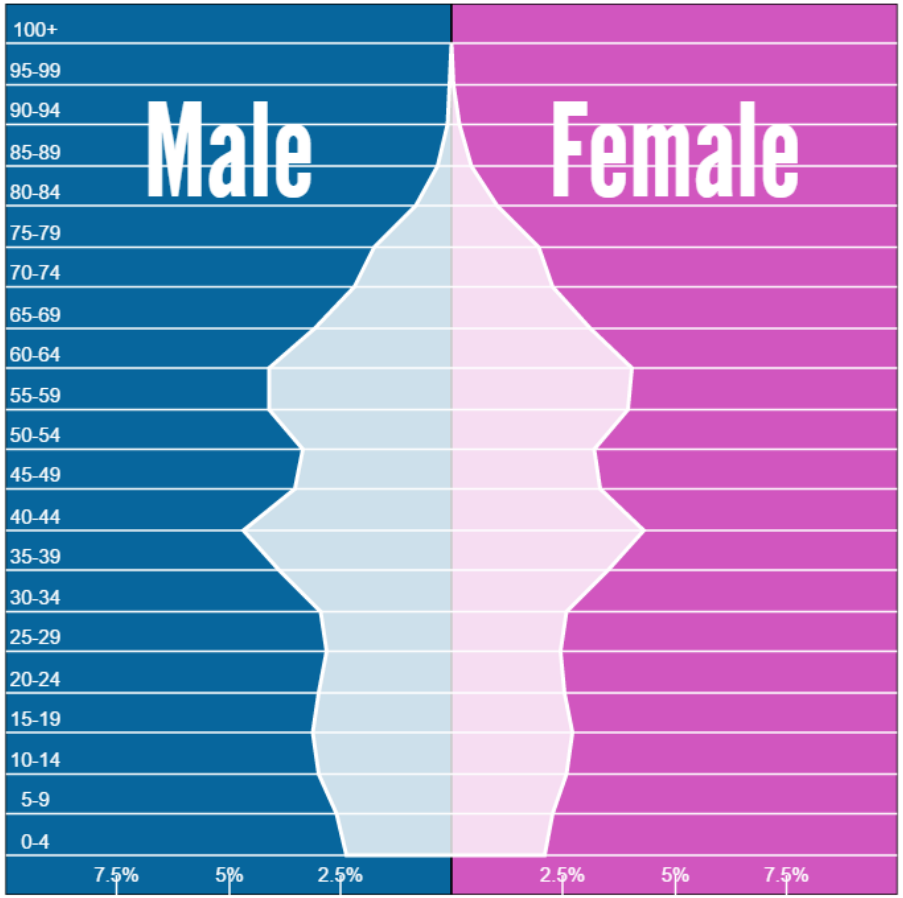
China 2015

Population: 1.376.048.000



China 2030

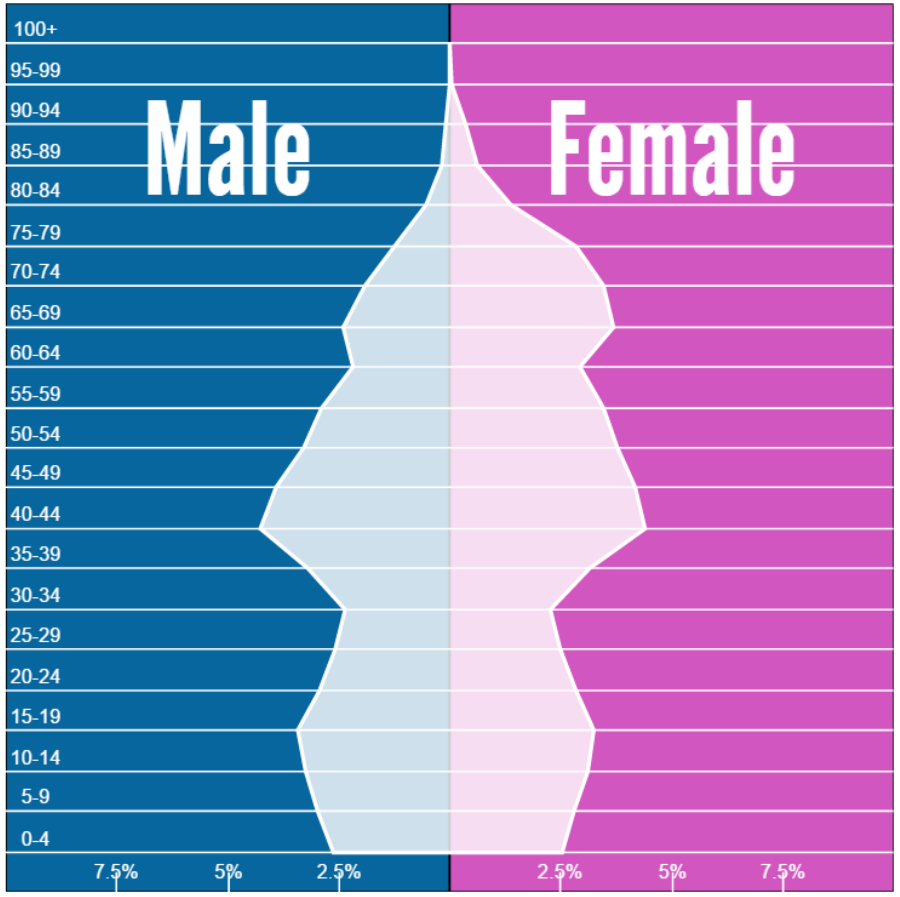
Population: 1.415.545.000



Global Challenges: Aging Electorates inside Regional Powers

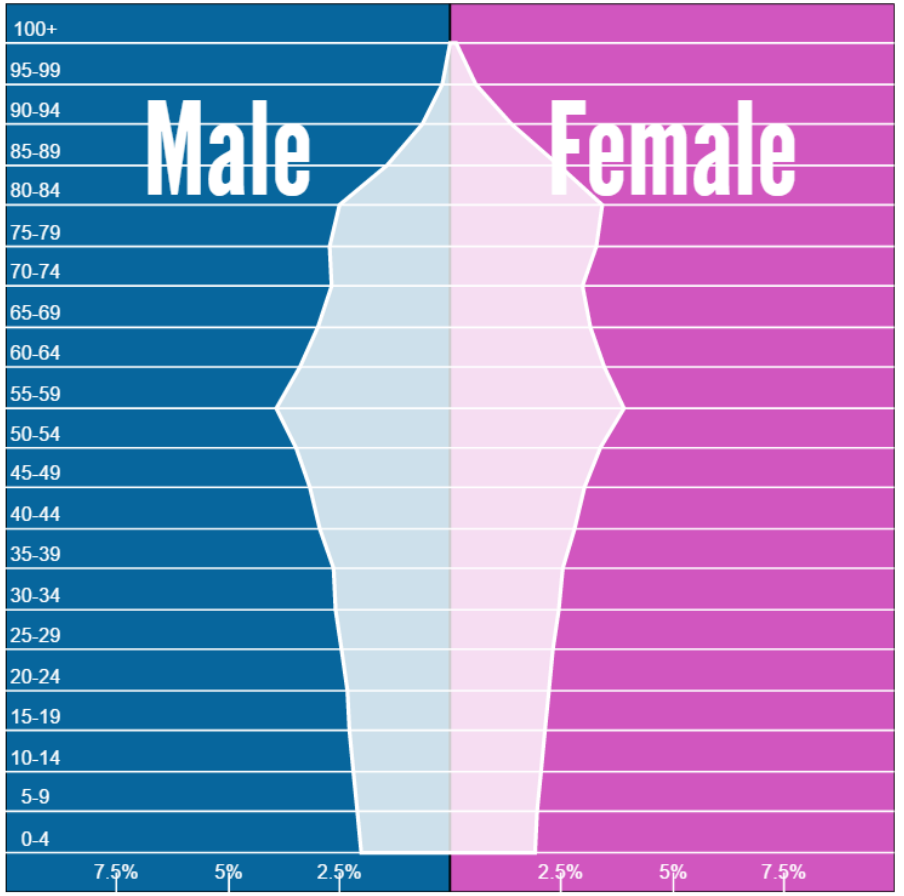
Russian Federation
2030

Population: 138.652.000

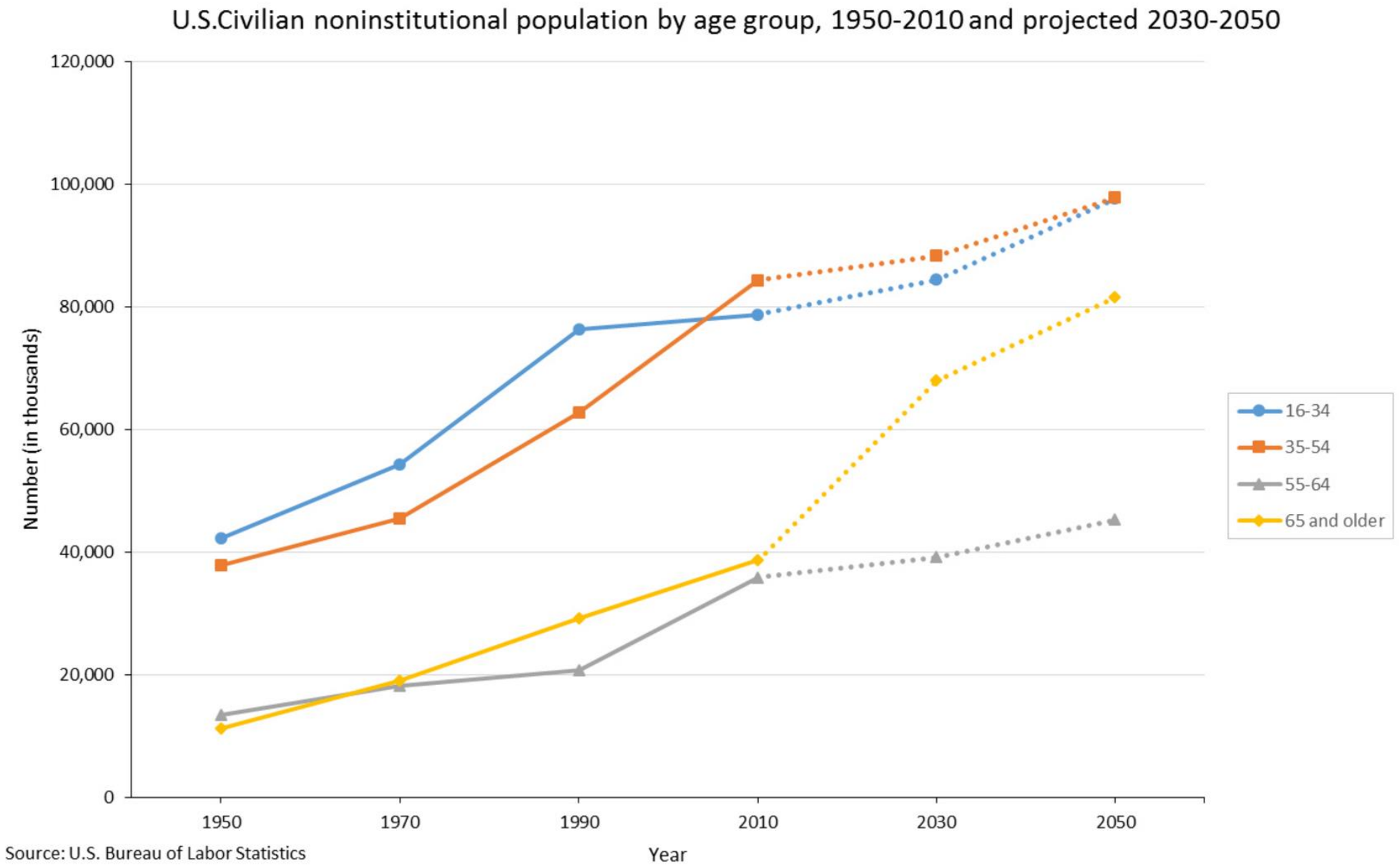


Japan
2030

Population: 120.127.000

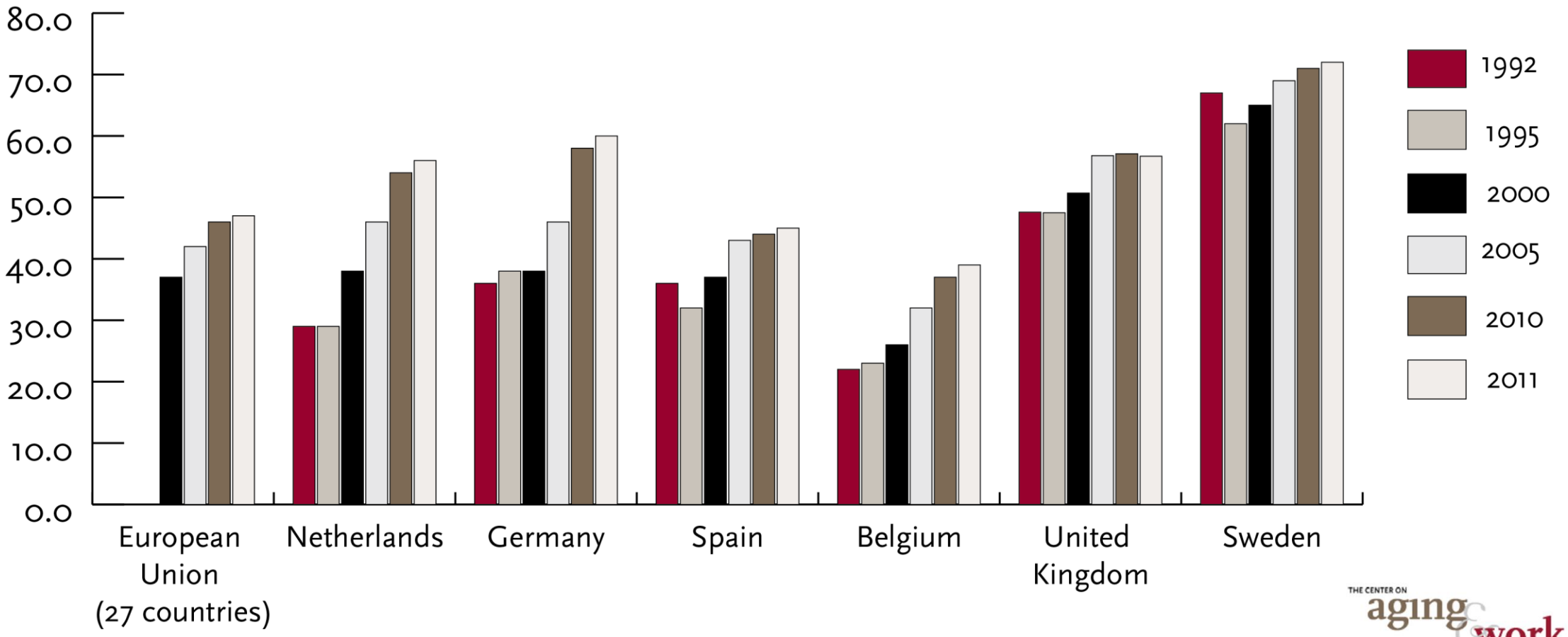


#1 Uncertainties of Employers + Workforce Composition



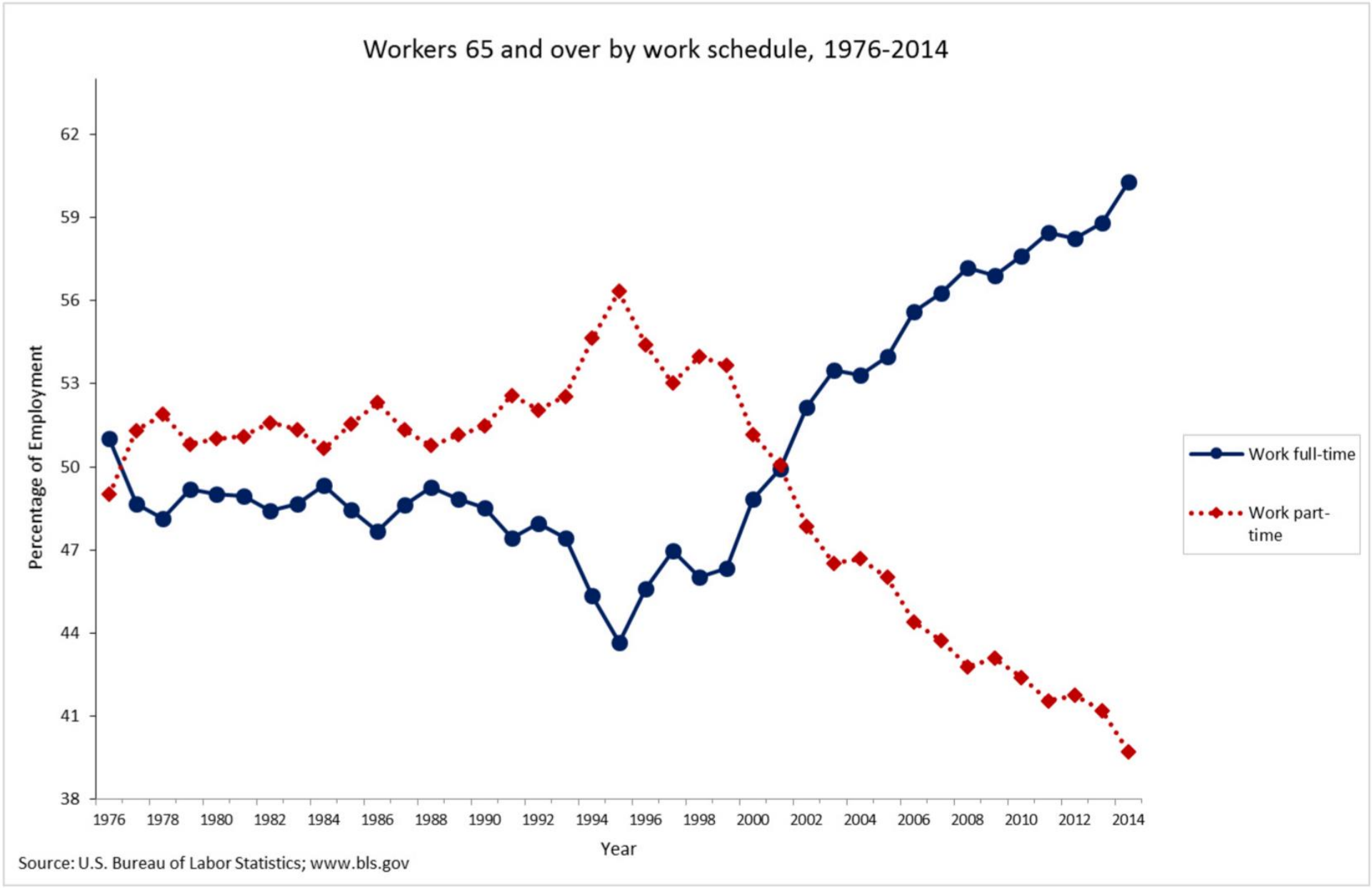
#2 Uncertainties of Retirement Waves

Fig 1: Percentages of people between the ages of 55 and 64 participating in the European workforce, from 1992 to 2011 (Eurostat, 2012)*.

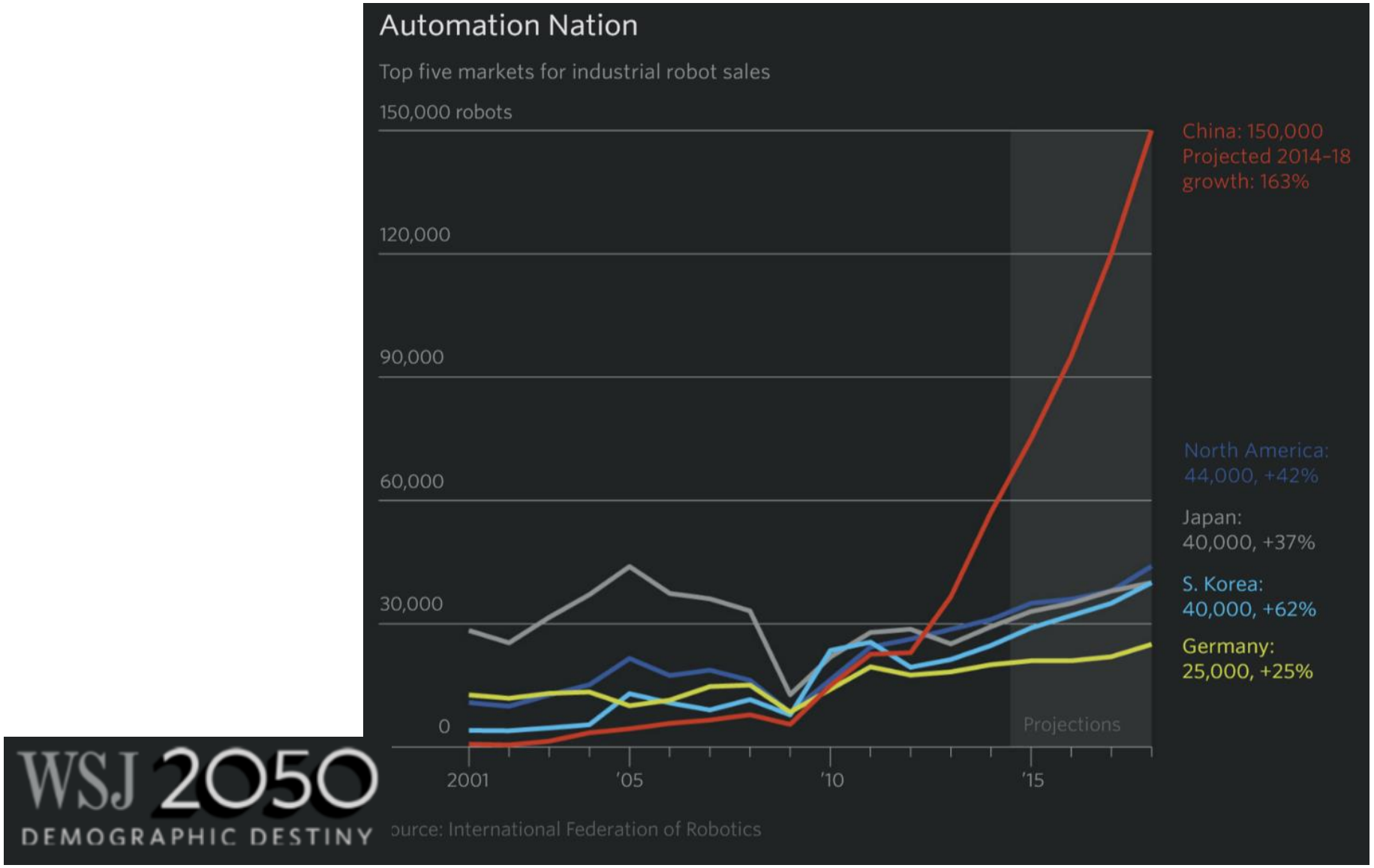


THE CENTER ON aging & work AT BOSTON COLLEGE

#3: Uncertainties of Full-time, Part-time vs Gig

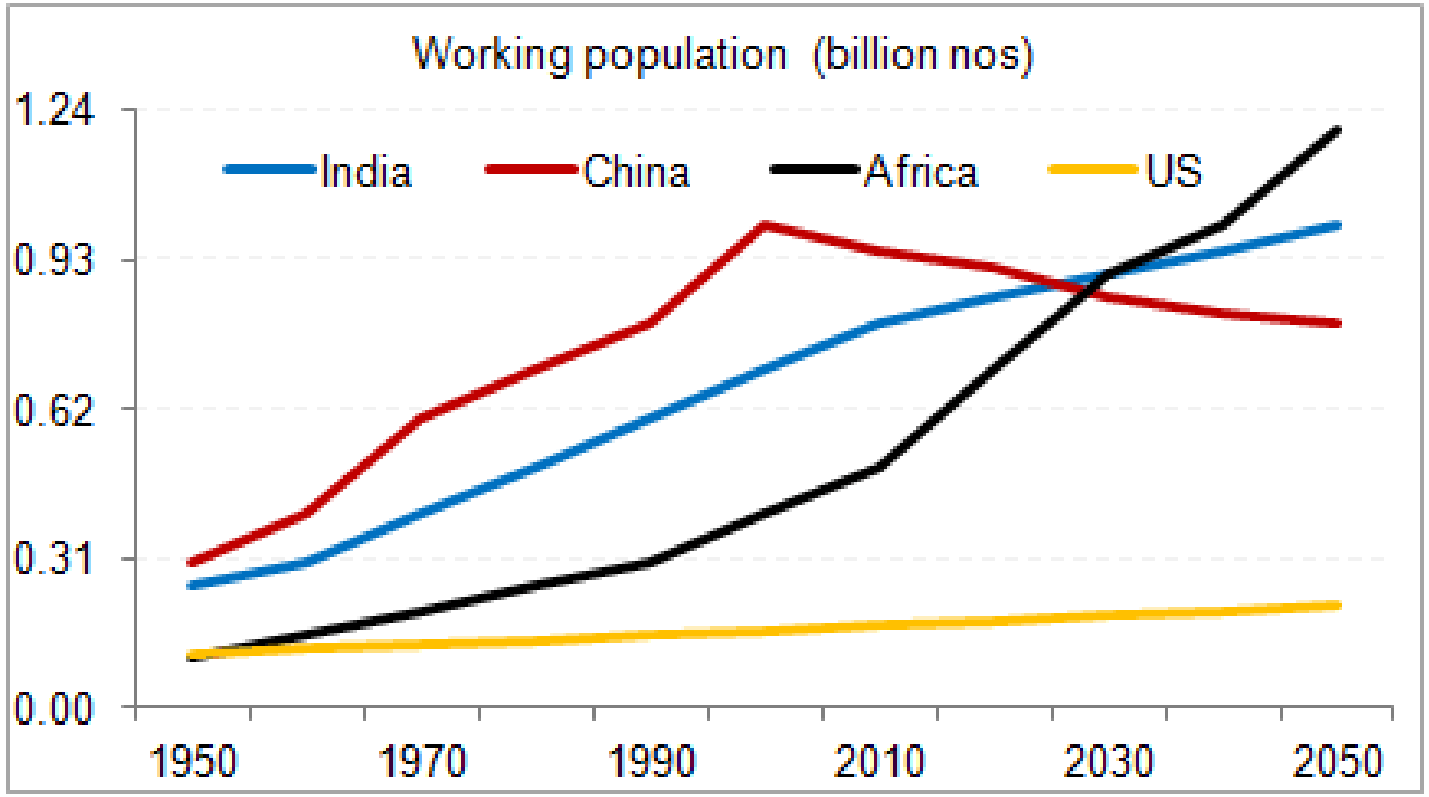


#4: Uncertainties of Aging + Manufacturing Automation?



Uncertainties of Loyalty

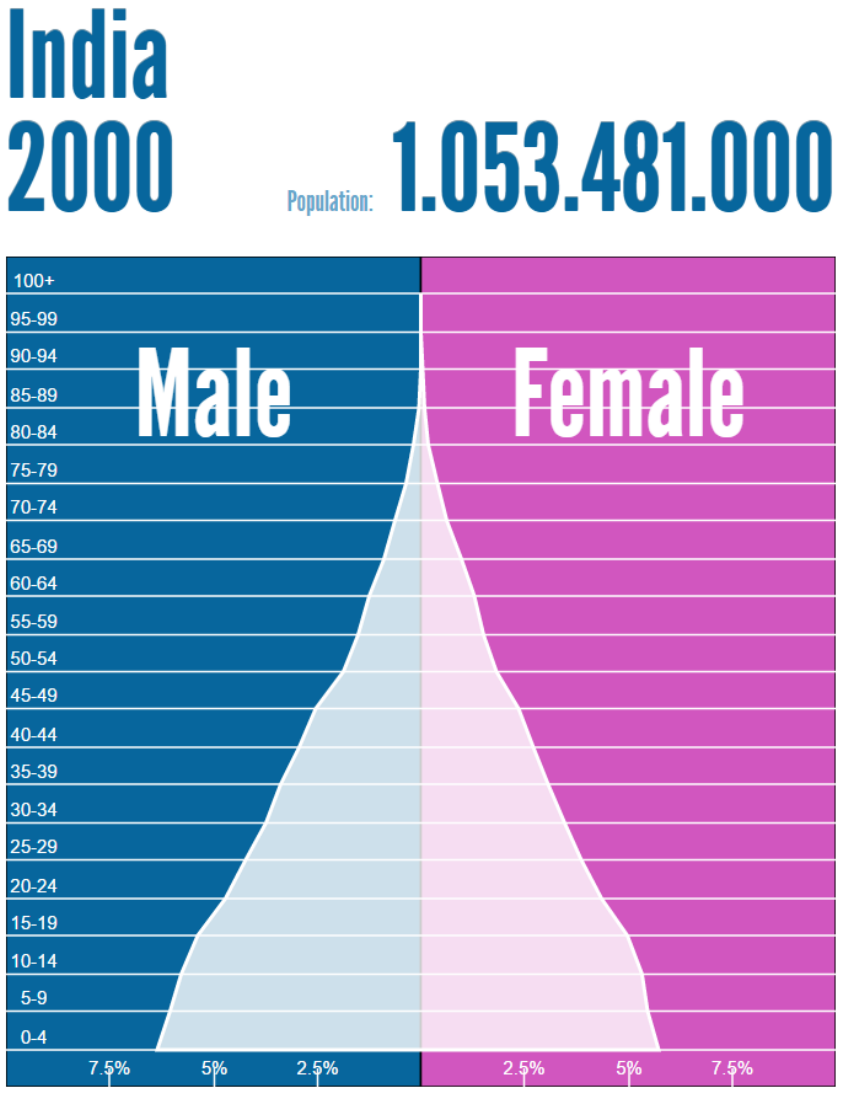
Will Trans-national Companies Seek Out Demographic Dividends?

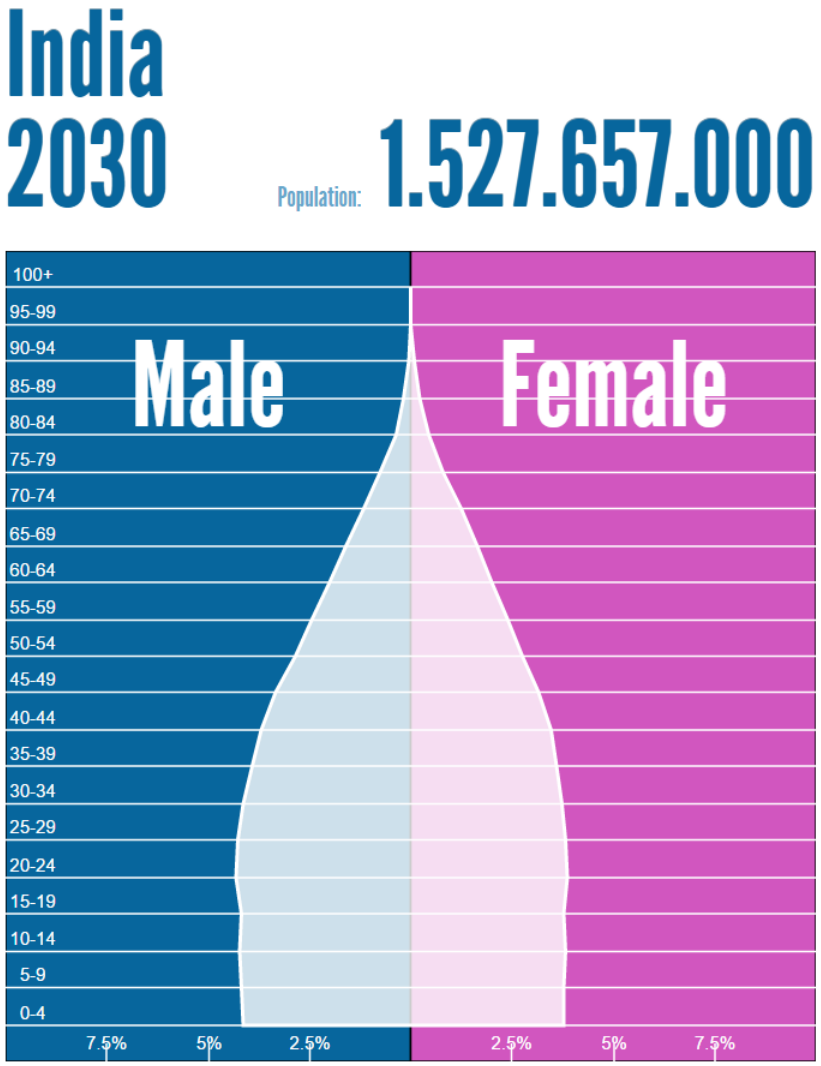


www.equitymaster.com

Source: Economist

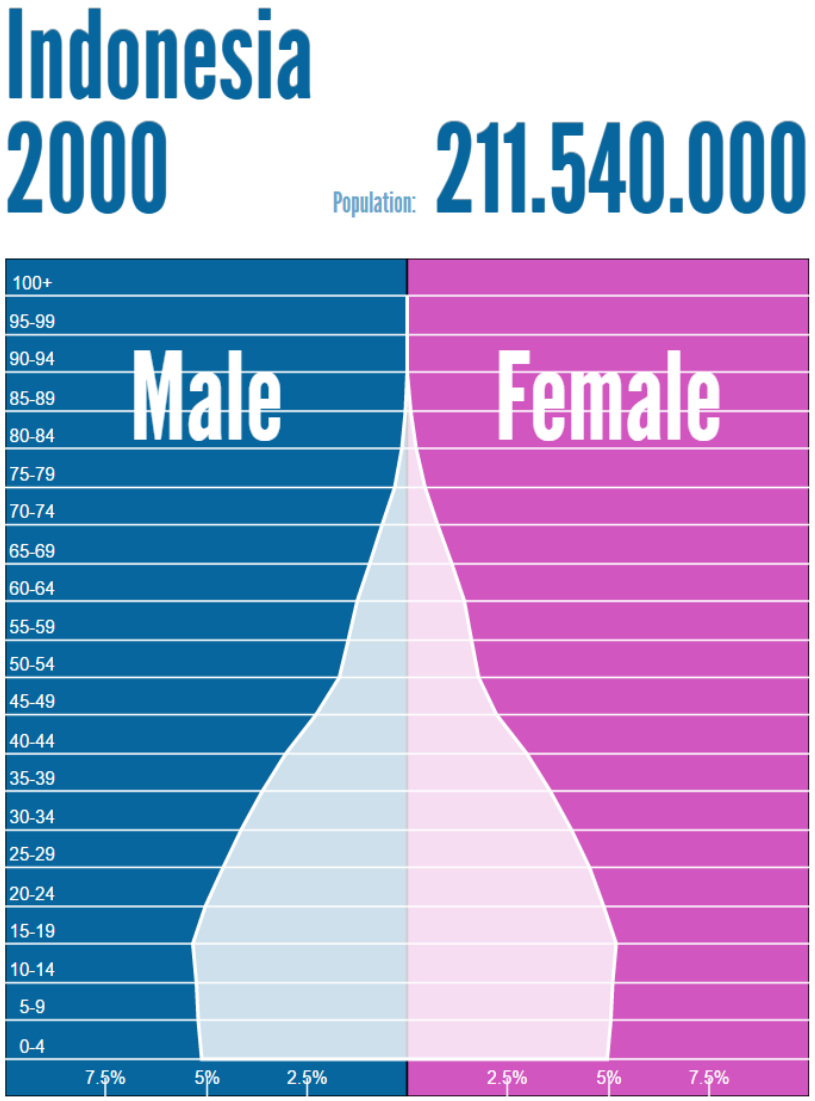
Investing in Global *Demographic Dividends*

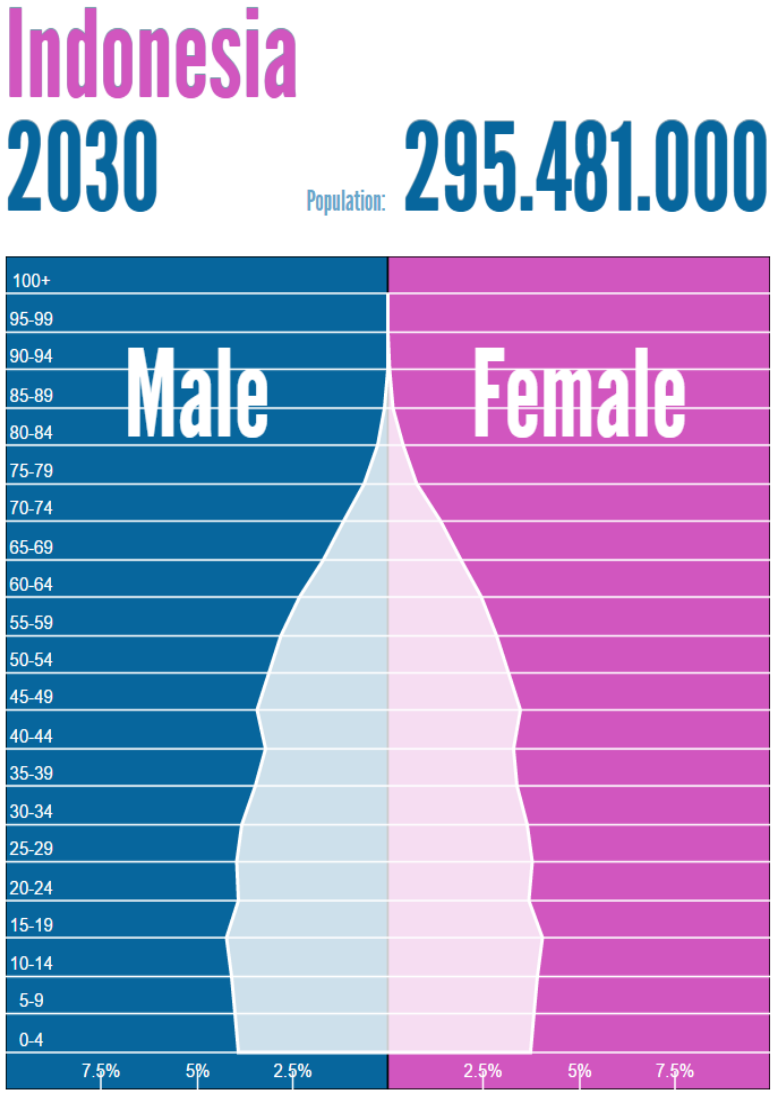




250 million joining workforce by 2030

Investing in Global *Demographic Dividends*

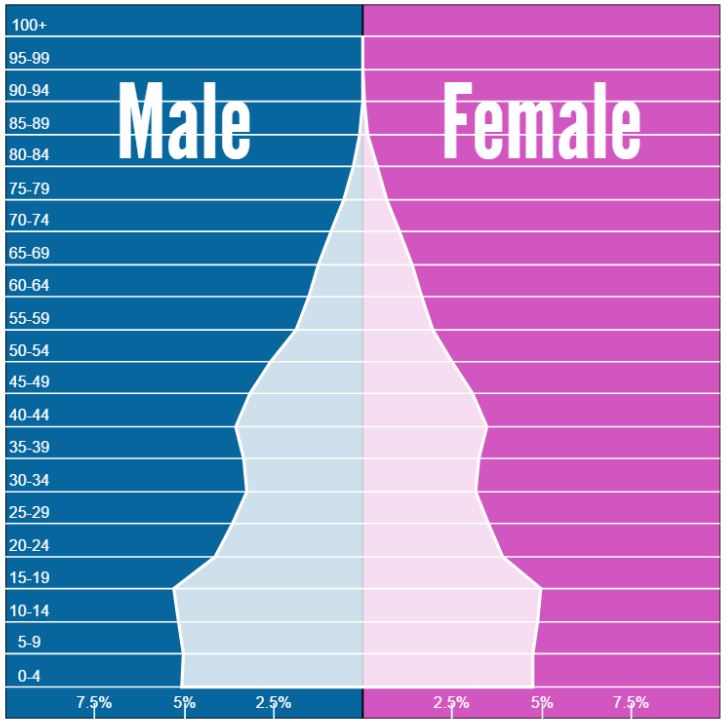




Investing in Global *Demographic Dividends* – MENA

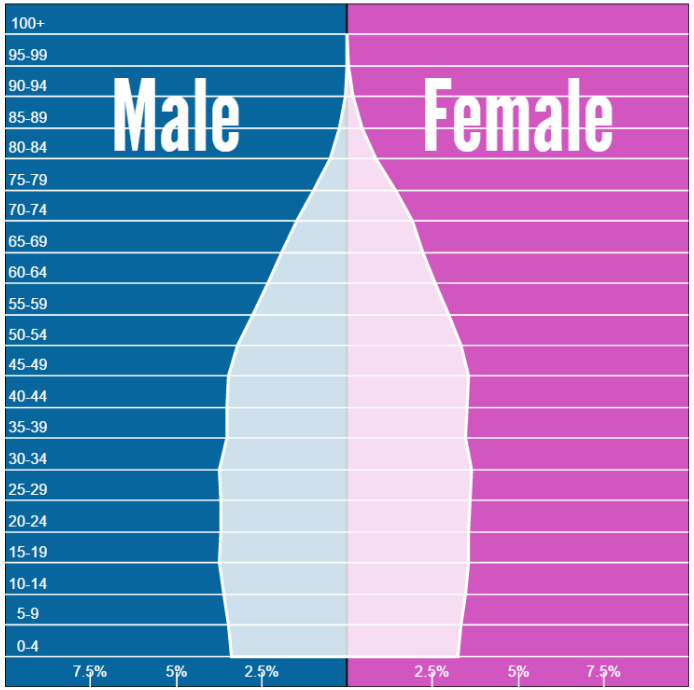
Egypt 2030

Population: 117.101.000



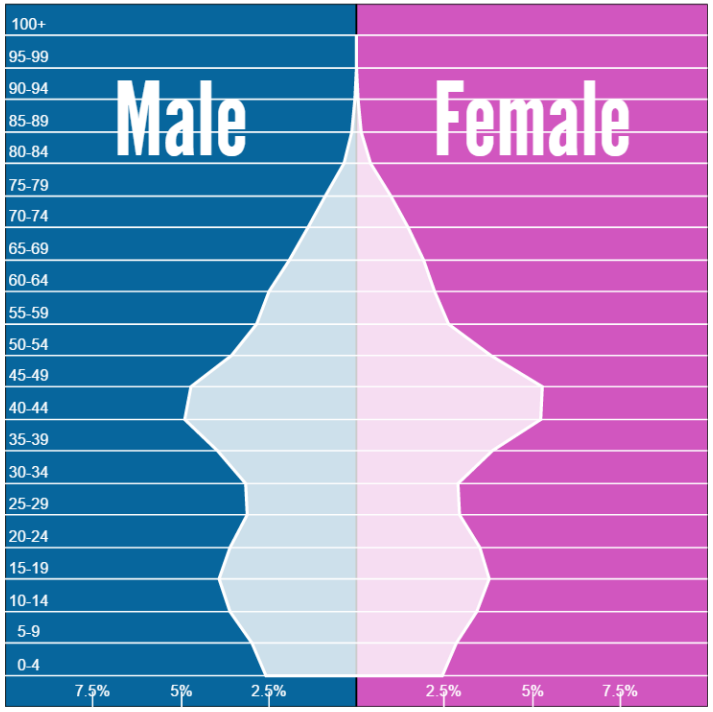
Turkey 2030

Population: 87.716.000



Iran (Islamic Republic of) 2030

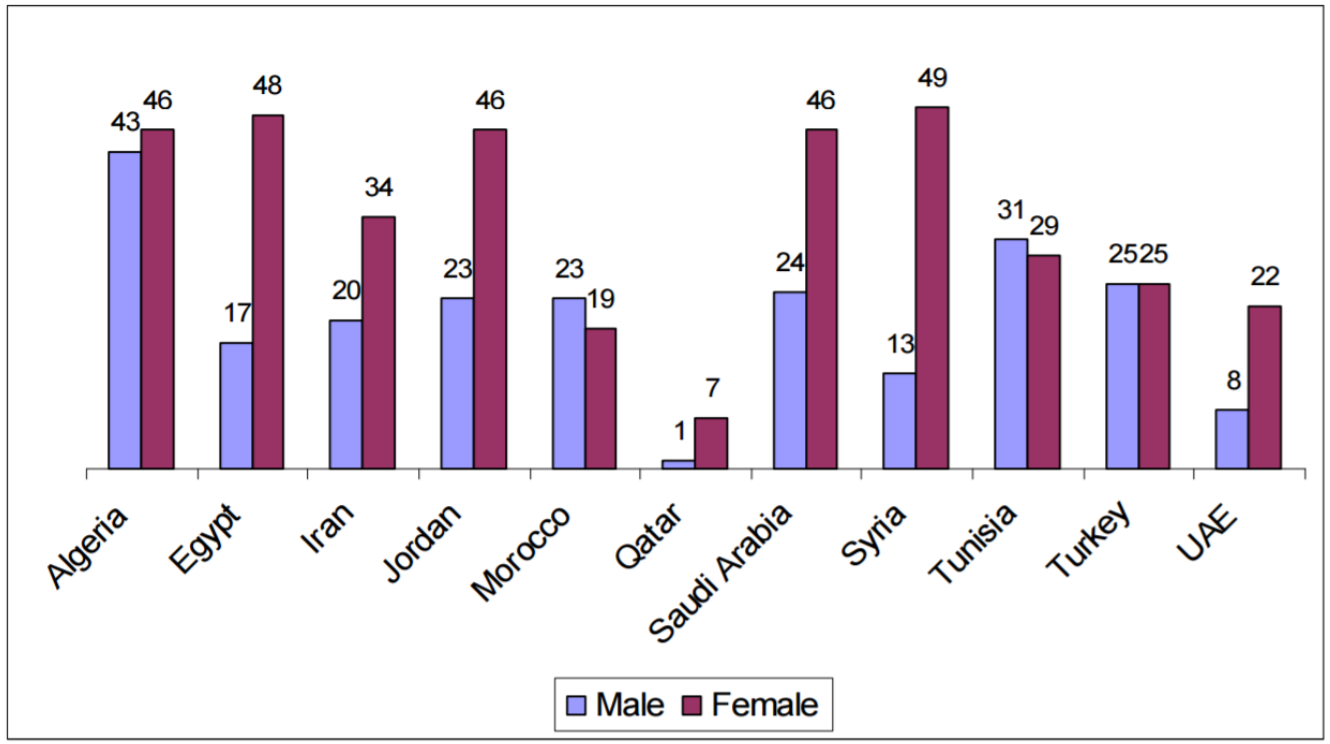
Population: 88.528.000



The Lingering (Global) Challenge of Youth Unemployment

Youth Unemployment Rates by Sex

Percent of labor force ages 15 to 24



Data refer to 2009, except for Algeria and Tunisia, which are for 2004.

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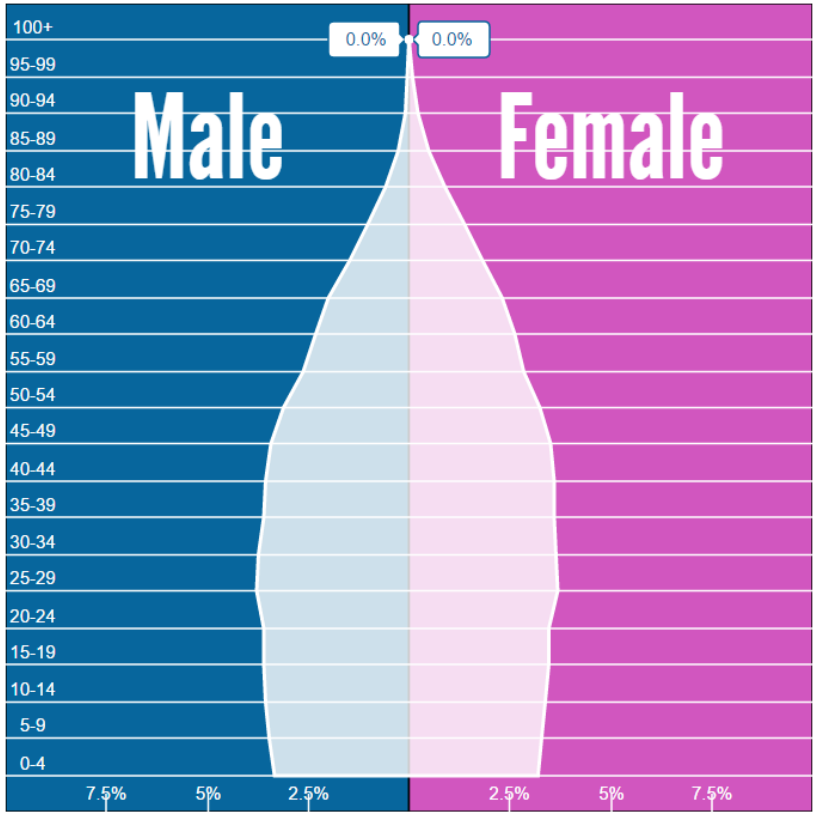
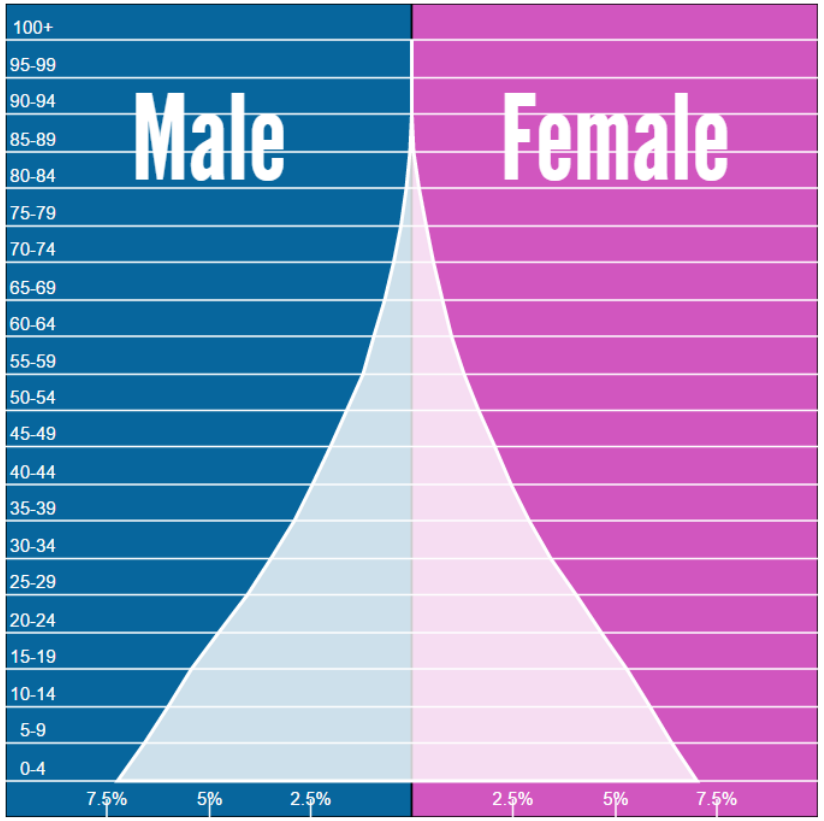
Investing in Global *Demographic Dividends*

South America
2030 Population: 470.965.000

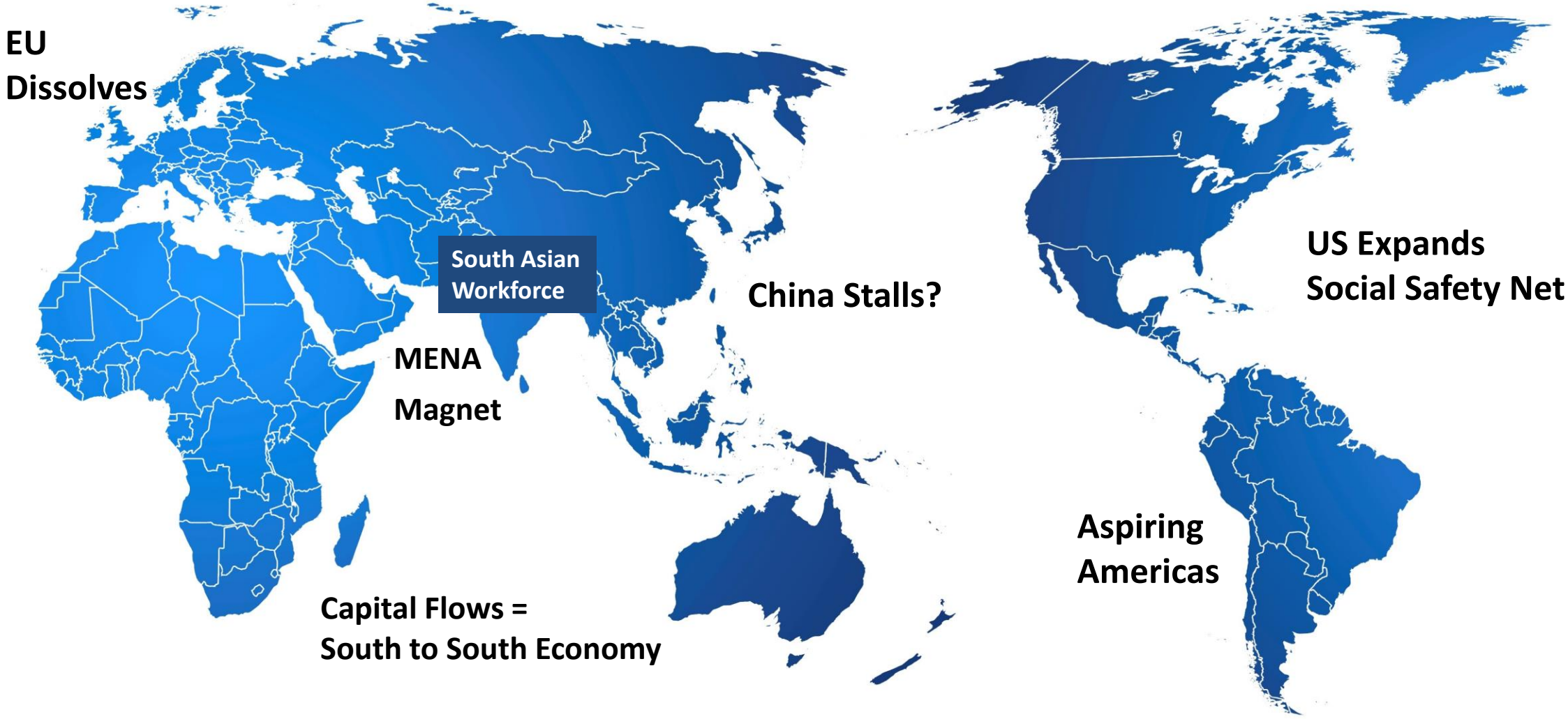


Sub-Saharan Africa
2030 Population: 1.396.853.000



Consider Tipping Points Ahead for Global Events

Aging Populations + Hope for Demographic Dividends Reshaping Global



Implications of Demographic Realities: Biggest Opportunity? Biggest Risk?

Learn More

Connect the Dots

- ❑ **Demographic Transition Model Concepts**
  (+market formation; +technology adoption)

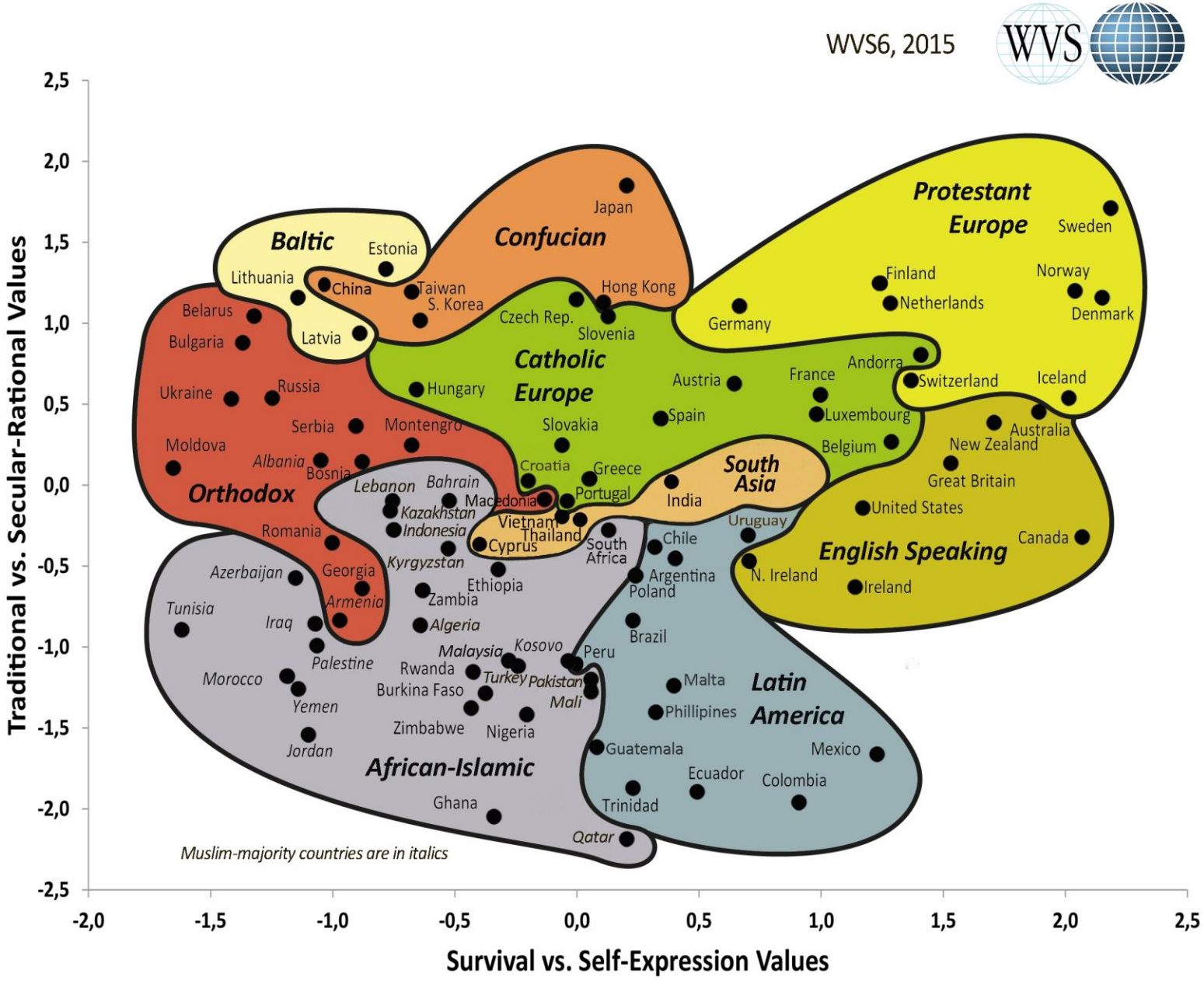
- ❑ **Garry's Diigo Tags**
  diigo.com/user/garrygolden/aging
  diigo.com/user/garrygolden/demographics

- ❑ **Spiral Dynamics Integral (SDi)**
  Bio-Psycho-Social Development Model

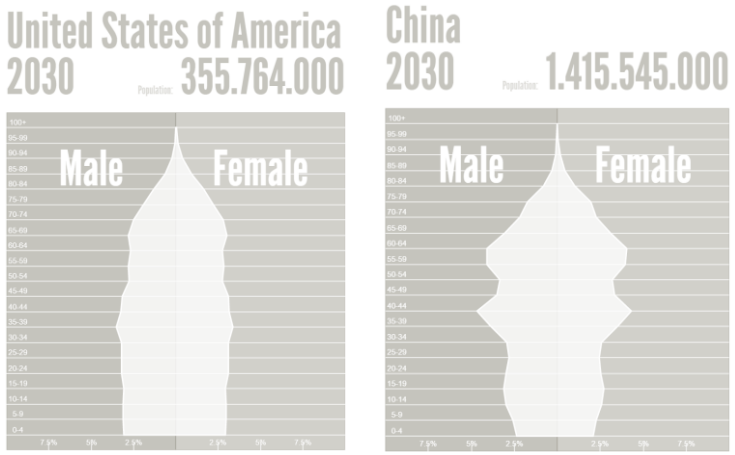
- ❑ **World Values Survey (University of Michigan)**

Demographic Meets Values Systems

Inglehart–Welzel Cultural Map



Global Drivers of Change 2017 – 2050



Demographic Destinies

Working with Intelligent Systems

Blockchain & Smart Contracts for Trusted Transactions

In the News

A Hong Kong equity investment firm has elected a software program to its Board of Directors as a voting member on key investment decisions.

True

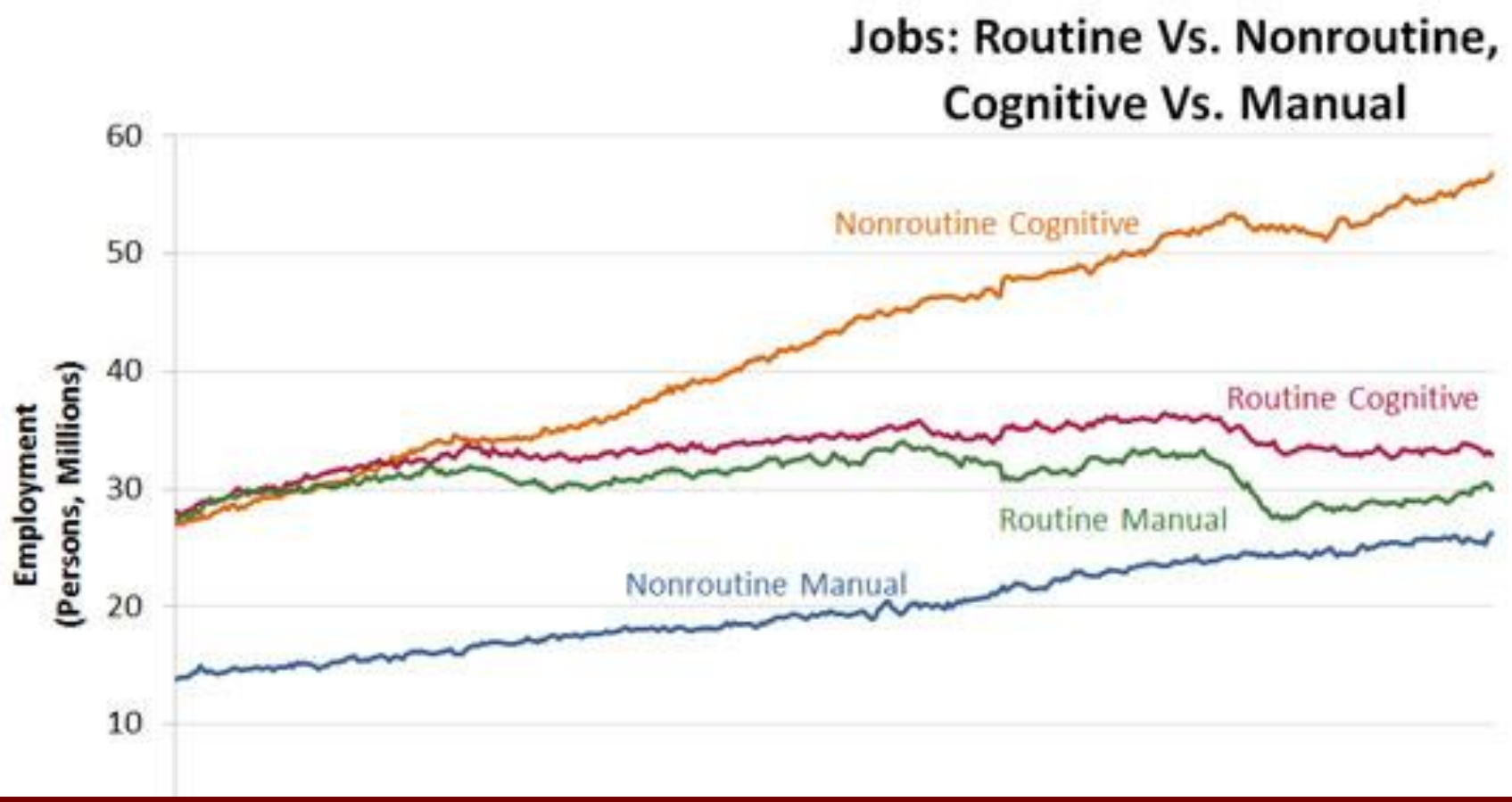
False

Deep Knowledge Venture's Appoints Intelligent Investment Analysis Software VITAL as Board Member

Hong Kong Venture Capital Fund Appoints Machine Intelligence as Board Member.

**VITAL (Validating Investment Tool for Advancing Life Sciences)

Cognitive Jobs,
Meet Cognitive Software



The Next Economic Revolution (and Social Disruptor) will be Humans working with Intelligent Systems

The Race to Build Intelligent Assistants

Google now

Hi, I'm Cortana.

amazon echo

MindMeld

ARTIFICIAL SOLUTIONS

IBM Watson

next IT

WARREN

KASISTO

If you look at what Apple is doing with 'Siri,' what IBM is doing with 'Watson,' and what Google is doing with 'Now,' **it is clear that the most powerful technology companies are investing immense resources to make virtual intelligent assistants ubiquitous before the end of the decade.**

- Daniel Nadler, CEO of Kensho

Where does the AI Assistant Revolution begin?

Buzzwords to Watch:

Bots
ChatOps
Chatbots
Intelligent Texting
Messaging Apps
Conversational Commerce
Intelligent Assistants

Are there events on campus featuring speakers from China?

Phase of Rolling Eyes at Chat*bots*

Specialized digital assistants and bots expected to generate over $600 billion in revenue by 2020

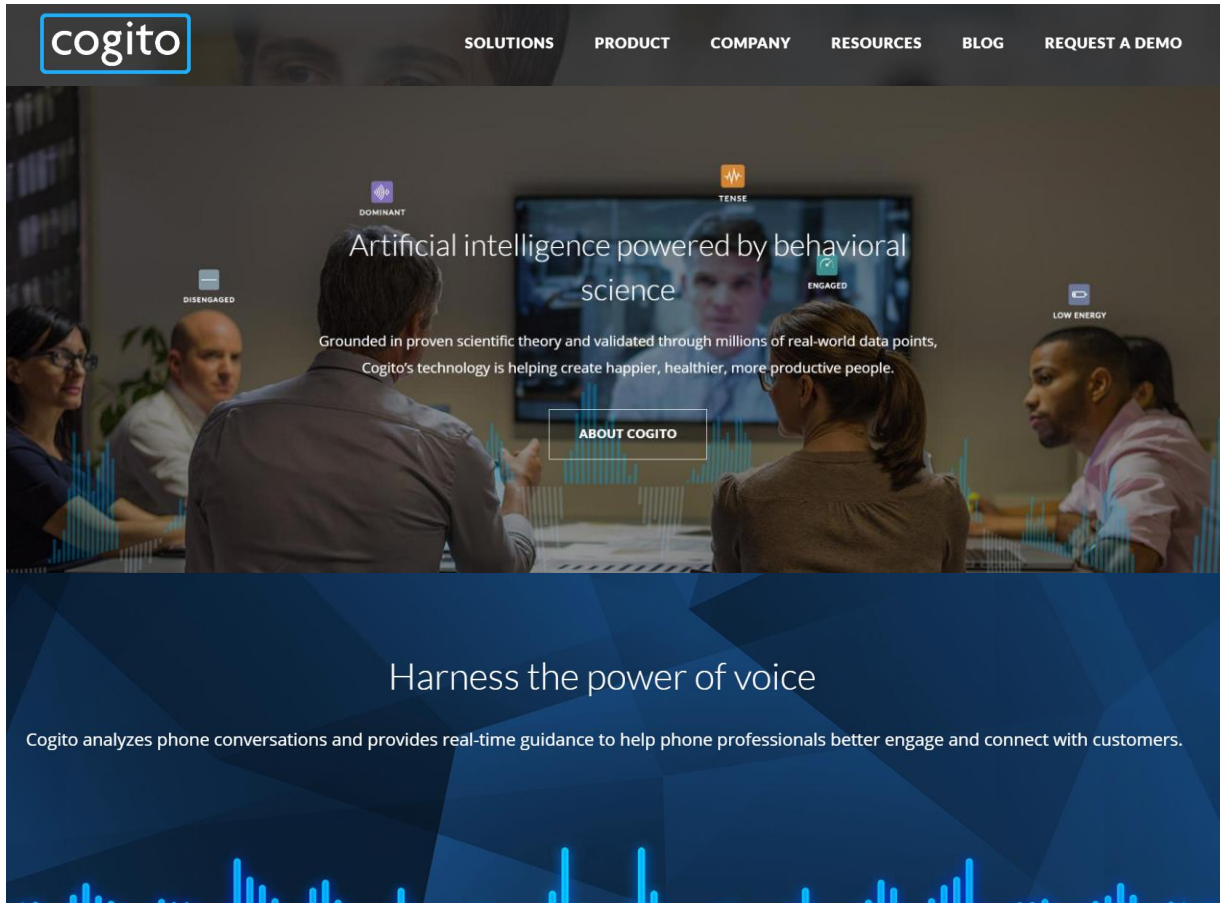
Microsoft is betting that bots 'are the new apps'

Facebook launches a bot platform for Messenger

Google follows Facebook into chatbots

Published: May 19, 2016 8:43 a.m. ET

Slow Pace of Fast Change: Working with Bots



MIT Technology Review

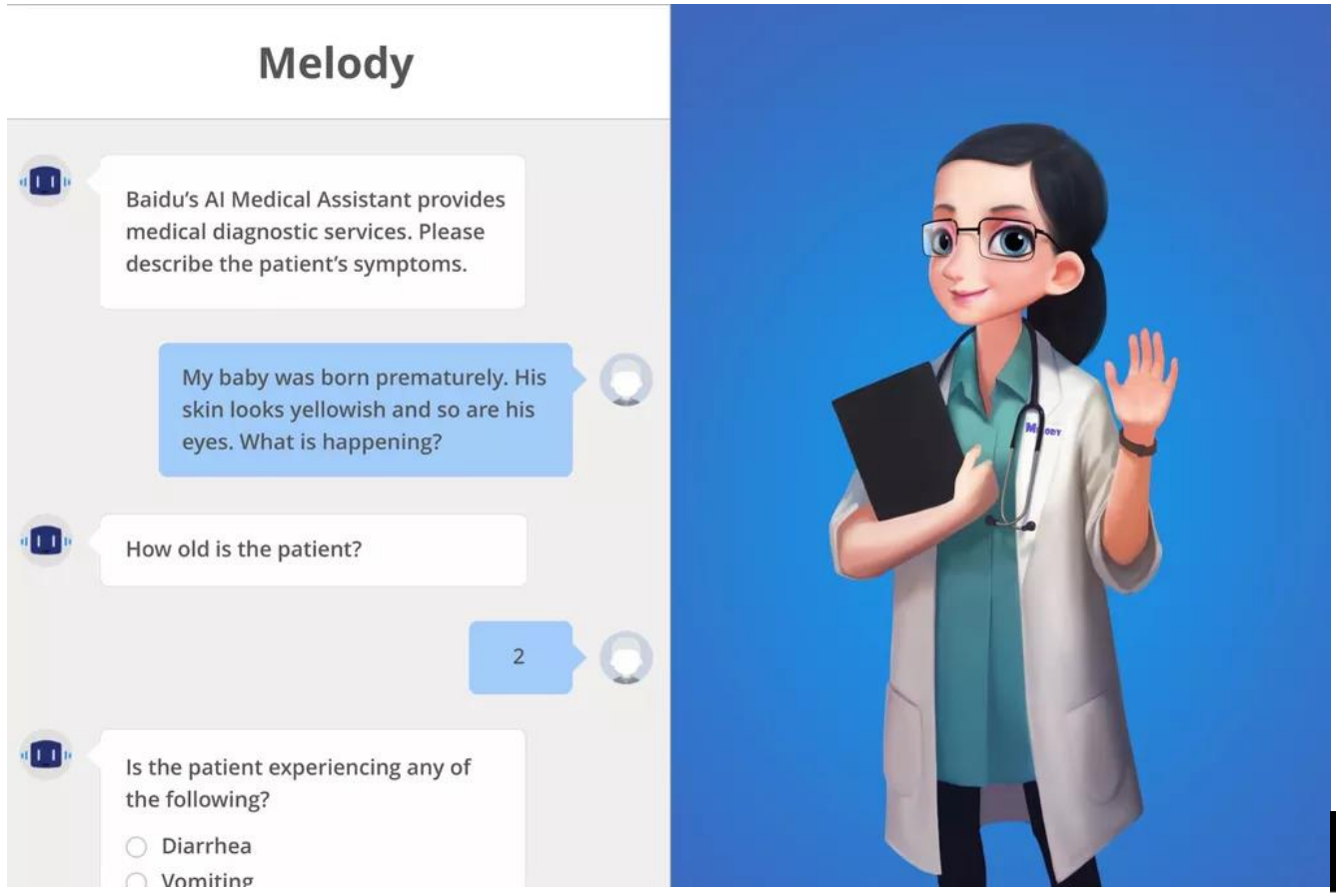
Socially Sensitive AI Software Coaches Call-Center Workers

Customer-service reps are getting real-time coaching from software that has learned to detect problems in a conversation.

by Will Knight January 31, 2017

Baidu launches medical chatbot to help Chinese doctors diagnose patients

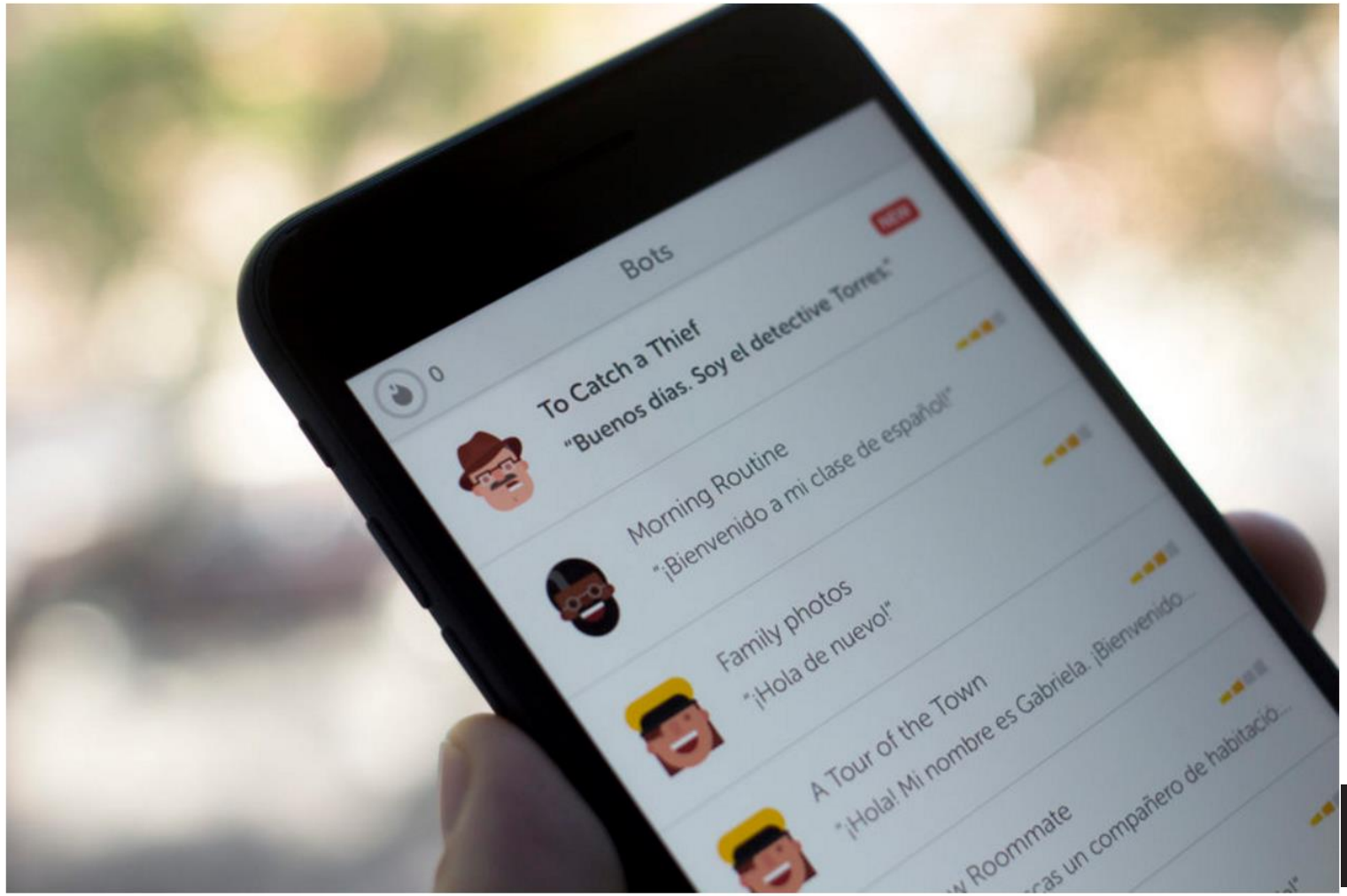
by James Vincent | @jjvincent | Oct 11, 2016, 5:08am EDT



THE VERGE

Duolingo's new bots can teach you to text in Spanish, French, and German

HARRISON WEBER @HARRISONWEBER OCTOBER 6, 2016 9:38 AM



THE WALL STREET JOURNAL.

TECH

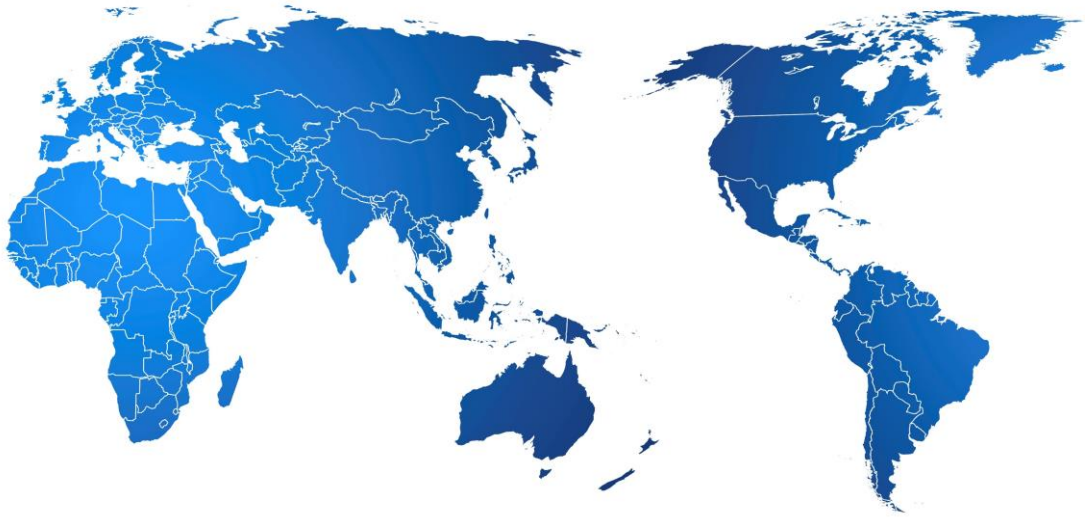
Wal-Mart Tells Workers: Don't Download Labor Group's Chat App

App designed by worker organization OUR Walmart is in the retail giant's crosshairs

Wal-Mart has a long history of fighting union activity in its stores. More recently, the company has worked to address some labor-rights leaders' concerns. *PHOTO: BLOOMBERG NEWS*

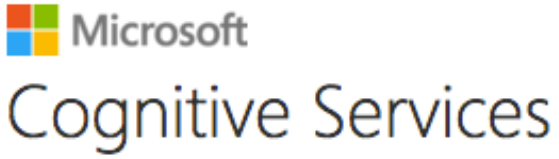
Social Implications of Algorithms with Personality

How might people across the world embrace, abuse or ignore the ‘bot’ era of messaging and behavior change?



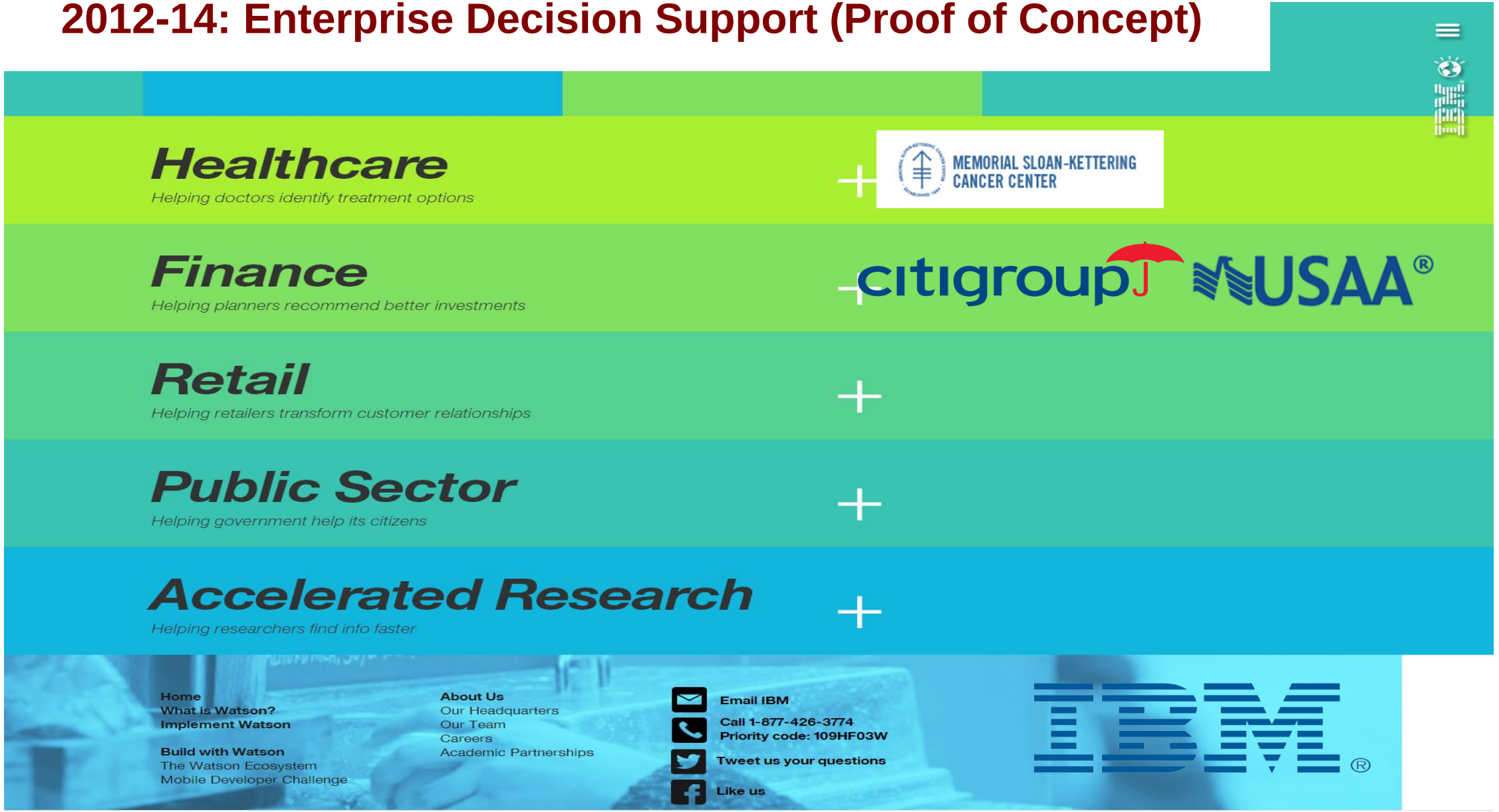
Phase Two

Human Plus AI Transforms Service & Knowledge-driven Work

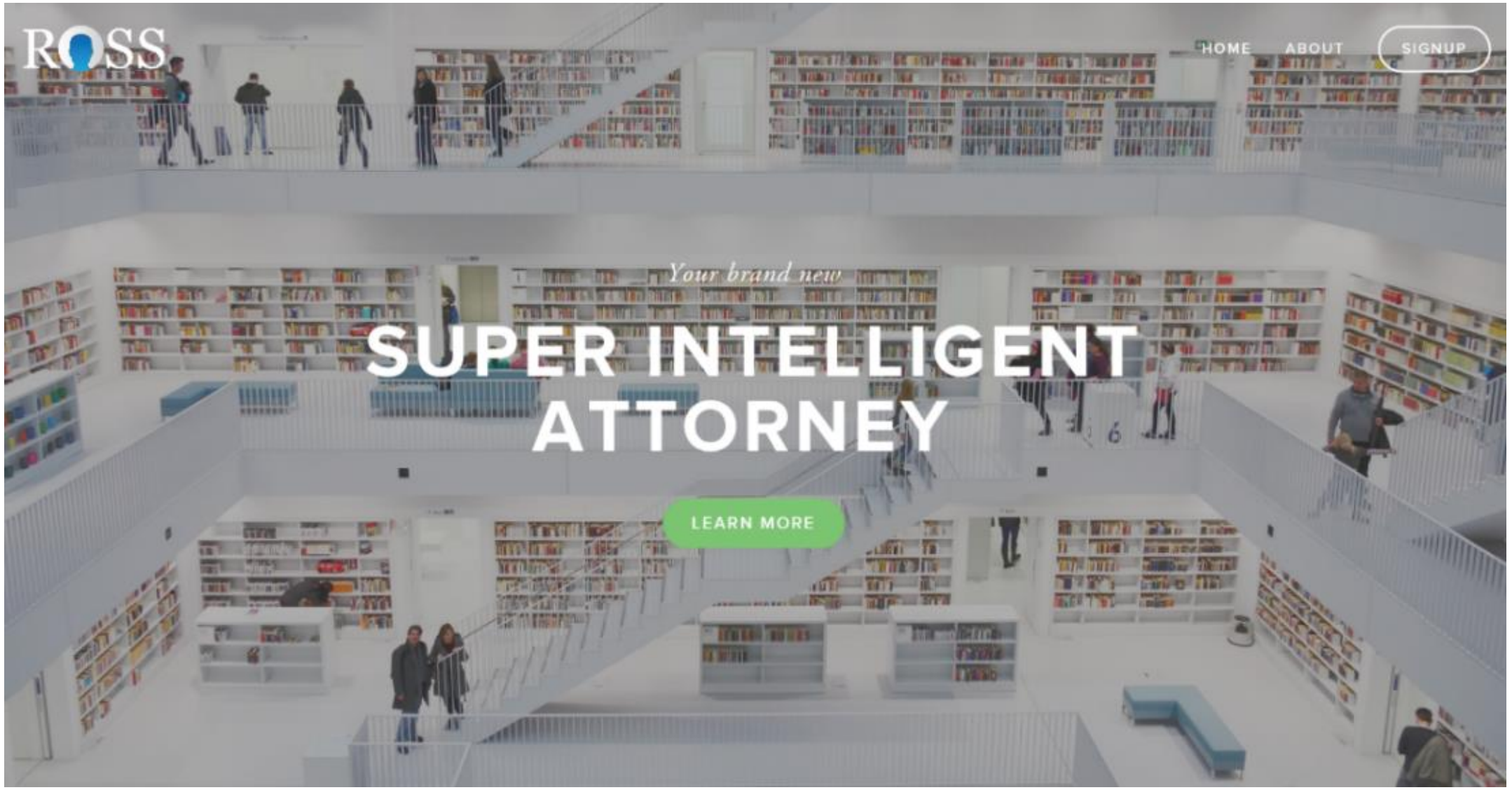


2011: IBM's Watson – Game Show

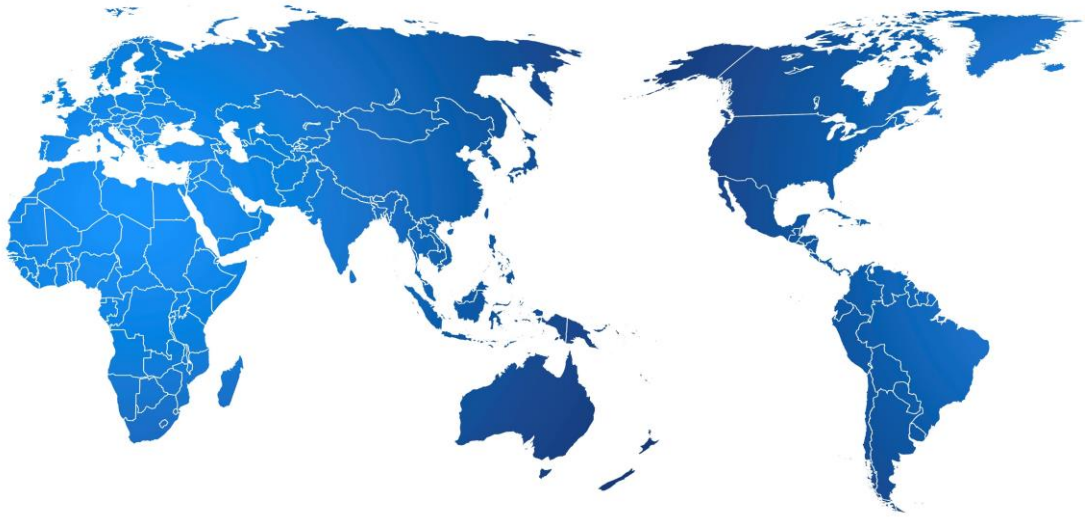
2012-14: Enterprise Decision Support (Proof of Concept)



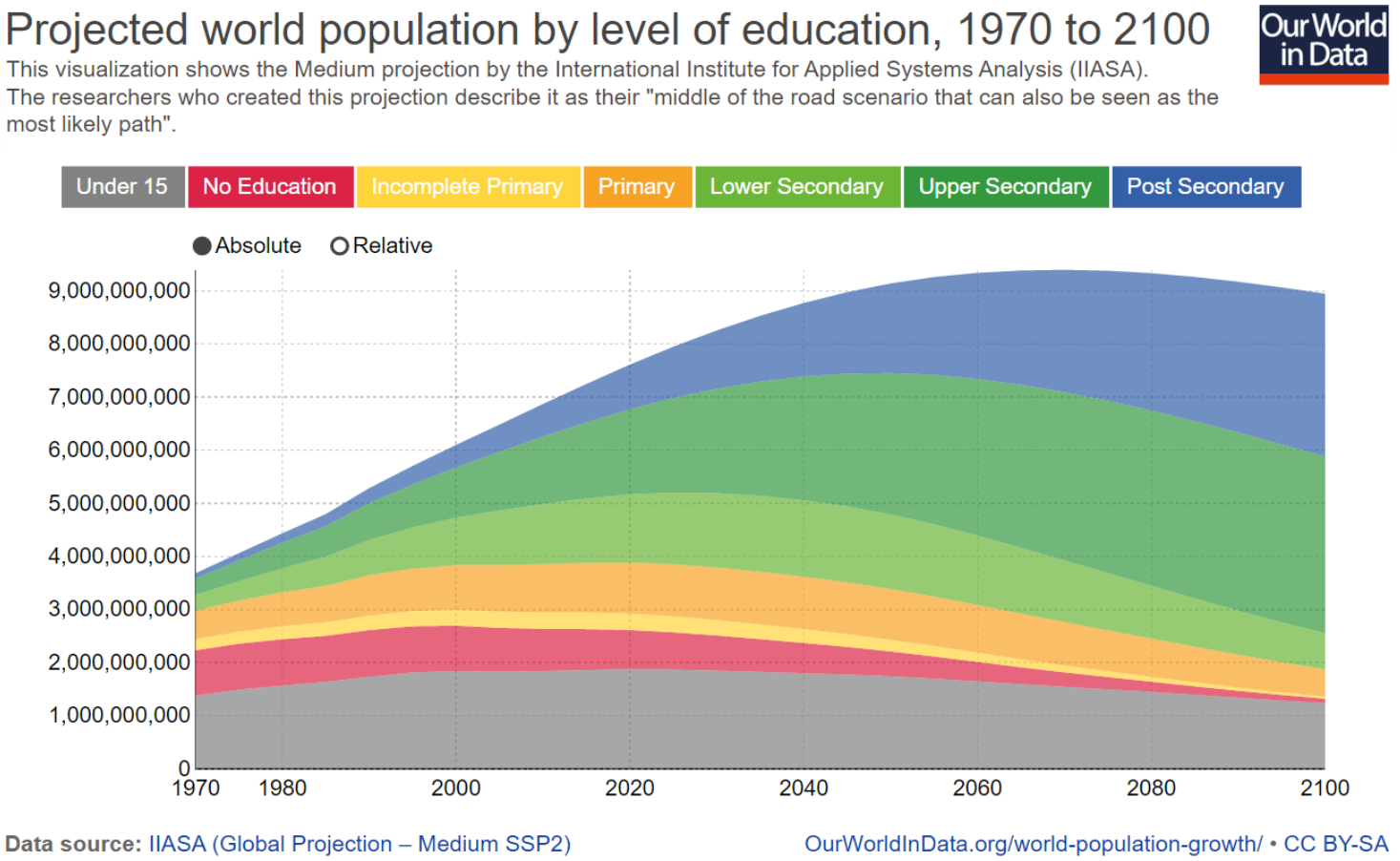
2015: Watson in *the Cloud (Cognitive-Apps-as-Service)*



How does the global workforce respond to *Watson in the Cloud – and Intelligent Assistants at work*?



What if Intelligent Assistants could drive lifelong learning?



Blockchain

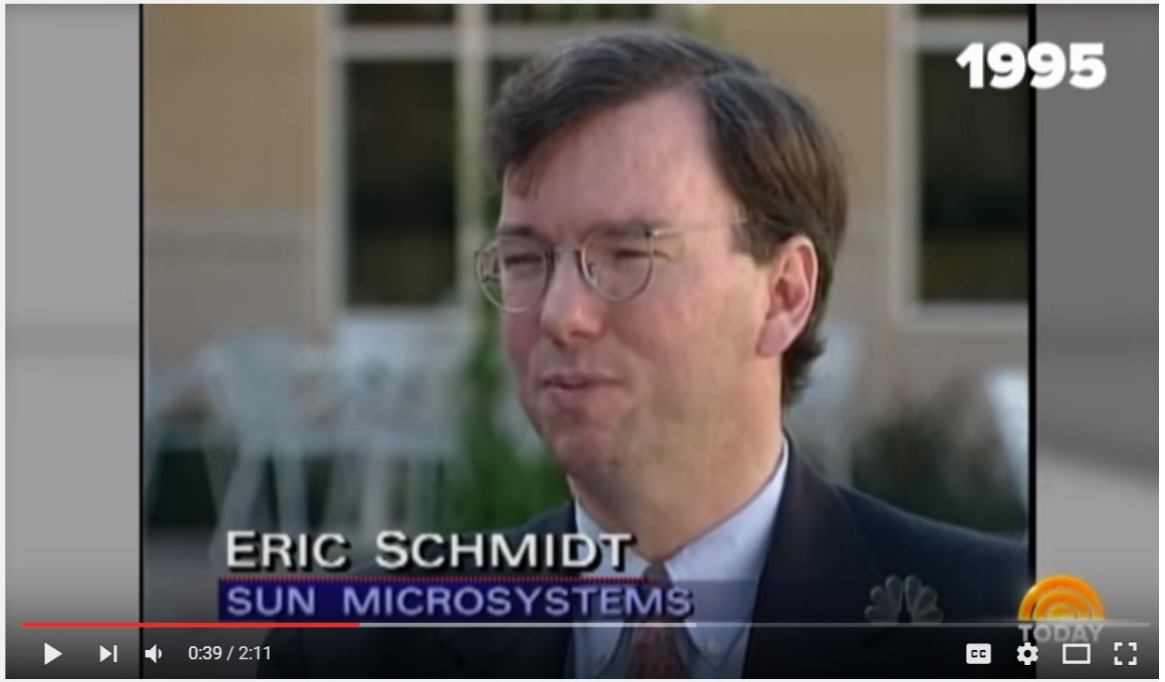
+ Smart Contracts

Remember, It Was Hard to Explain the Internet in 1994

1994: "Today Show": "What is the Internet, Anyway?"

All descriptions failed:

- ❑ It's a billboard
- ❑ It's a massive network
- ❑ *You write to it, like mail*
- ❑ Great for emergencies
- ❑ 'You don't need a phone line to operate the Internet?'



Flashback! The Internet In 1995 | Archives | TODAY

TODAY

World Economic Forum Survey Projects Blockchain 'Tipping Point' by 2023

By 2025, 10% of Global GDP will be orchestrated by blockchain applications.

Evolution of the Web: Trust for Transactions

Internet of Files (Websites)

Internet of Social Networks

Internet of Transactions

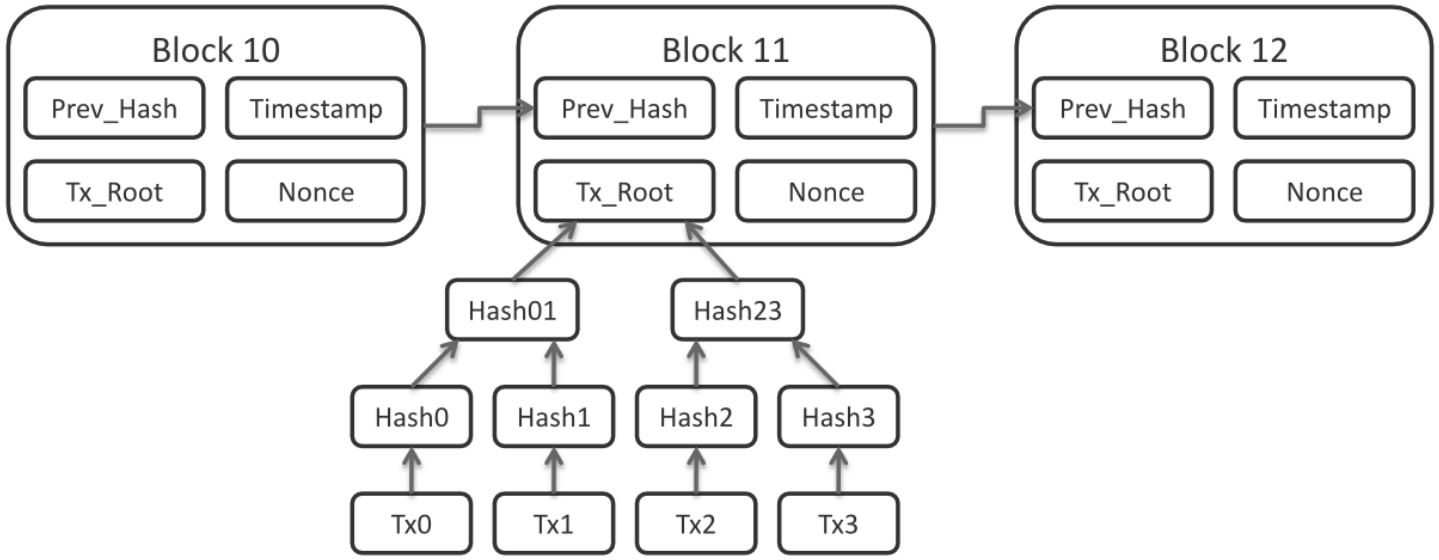
Low Cost + High Security

It's just Decentralized Databases + Process Automation!

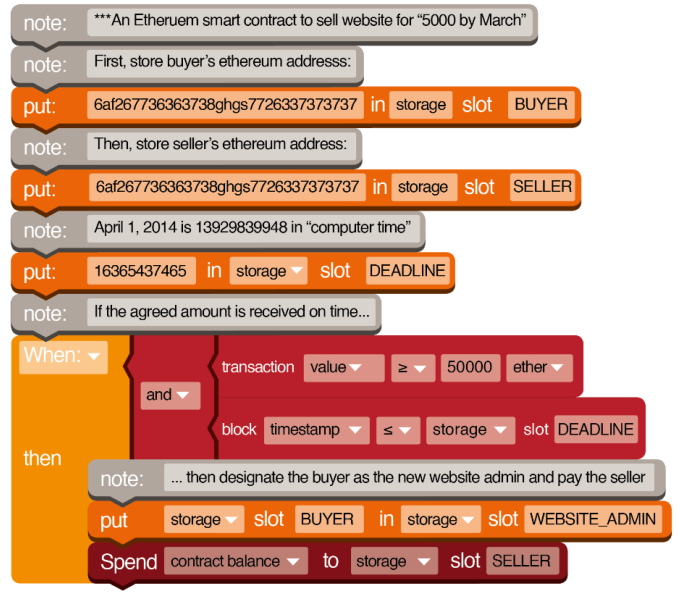
***Assets* get entered onto the ledger and generate keys**

Network Consensus on who did what…

Smart Contracts execute legal agreements + business processes



A sample of EtherScript



Application Development Ecosystems

Public Blockchains

Private Blockchains

HYPERLEDGER PROJECT

Fabric + Sawtooth Lake

Peer to Peer Exchanges

Decentralized exchanges to disrupt* the third-party while opening up service stack for new value driven services. *Low fees may still apply.

PEERTRACKS

ujo MUSIC

iTunes without iTunes
Smart Contracts disperse payments

La'Zooz
Collaborative Transportation

ARCADE CITY

Uber without Uber
Distributed Ridesharing

TRANSACTIVEGRID

Peer to Peer Energy Trading

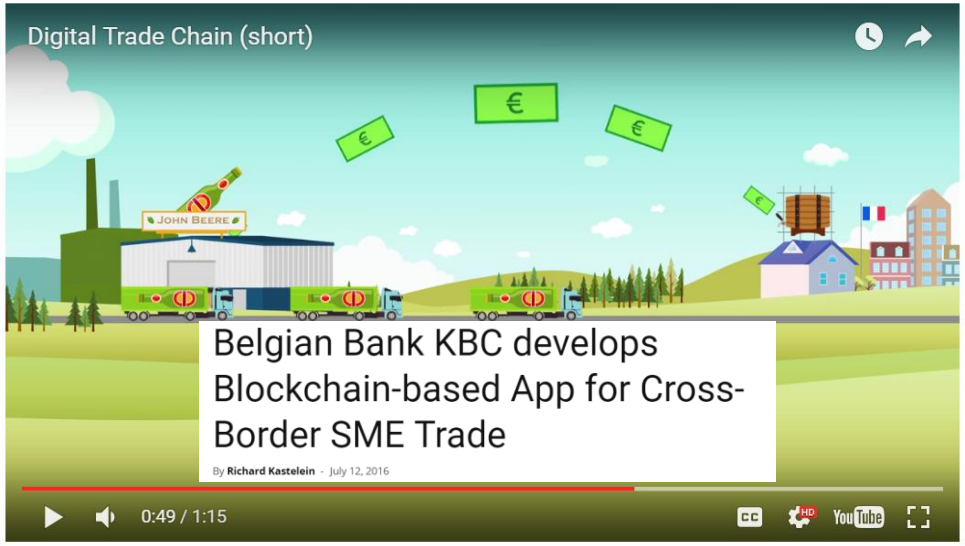
OpenBazaar

ebay without ebay
Distributed Marketplace

Could decentralized exchanges empower societies or leave us unemployed?

Supply Chains + Logistics

Distributed Supply Chains for efficiency, low cost, transparency and automation for origin verification, manufacturing logs, OEM assembly, shipping, fulfillment, financing, value added taxes, and settlement.



Enhance Trust. Access Capital.

DISTRIBUTED TRADE — Learn how blockchain technology is revolutionizing supply chain — St. Louis, Missouri - June 14, 2016

PROVENANCE

Fluent

skuchain

WAVE

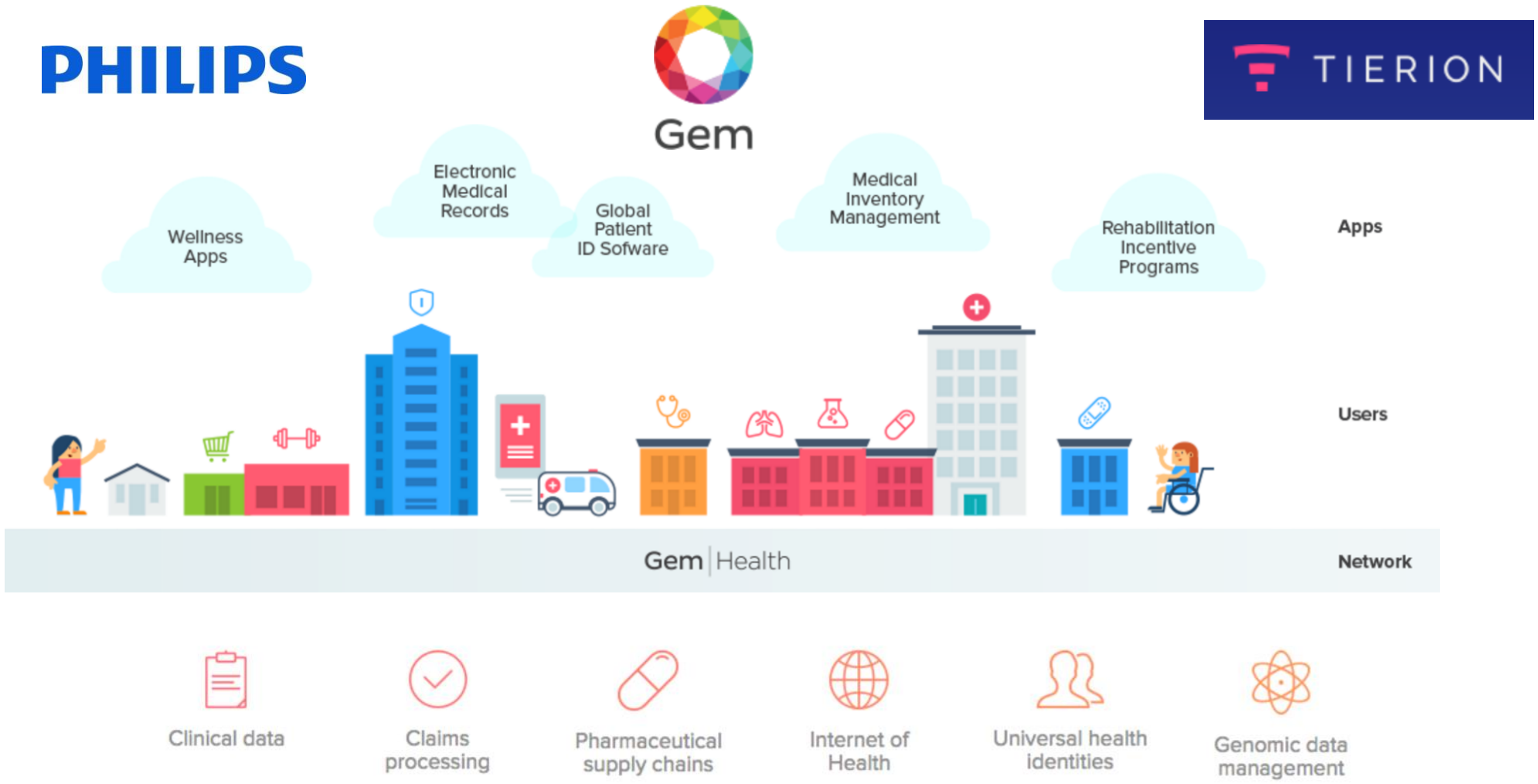
Open Trade Docs

nimber

Could supply chains be radically expanded for smaller businesses?

Healthcare + Wellness Sector

Improve efficiencies, reduce fraud, and use smart contracts for programmable compliance and reward systems to scale behavior change.



DApps for Public + *Third* Sector

Government Services

- ❑ Identity
- ❑ Regtech (Compliance)
- ❑ Budget Transparency (Fraud + Corruption)
- ❑ Voting
- ❑ Land Registry
- ❑ Financial Inclusion

UK government using blockchain to track welfare spending

The UK government recently began a trial using blockchain technology to track the distribution of benefits, which has raised some privacy concerns.

By Conner Forrest | July 14, 2016, 7:22 AM PST

U.S. Gov't Announces Blockchain Healthcare Contest

By ***Jamie Redman*** - July 9, 2016 6303 11

Dubai to use blockchain technology for all government documents by 2020

"will only need to enter personal data or business credentials once"

Could governments regain public trust in blockchain era?

Slides Removed

Foresight 101

End

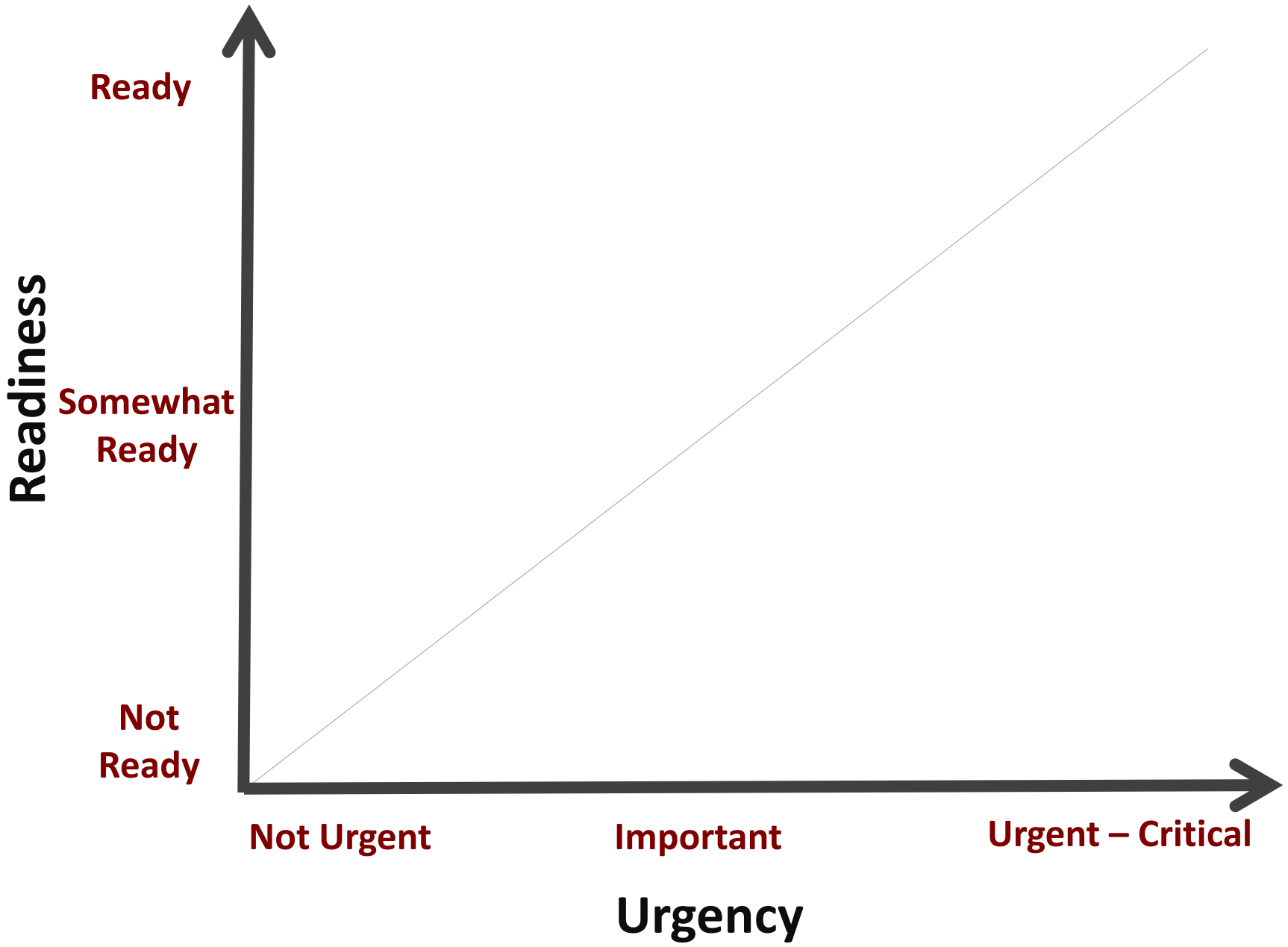
Warm up
Foresight 101

Drivers of Change

Discussion

Garry Golden
garrygolden.com/Feb15

Survey Leadership on Emerging Trends + Opportunities



Blockchain Key Concepts

Concepts to Understand

Cryptography (Hash; SHA-256; PoW; PoS; PoV)

Merkle Tree

Blockchain (Permissioned vs Permissionless)

Decentralized Applications (DApps)

Smart Contract (Oracle-based)

Keys (Public – Private)

Consensus Algorithms

Phrases to Explore

Transaction is Settlement

Ambient Accounting (Persistent state)

Validators

The Network is the Bank (Insurance Company)

Platforms to Explore

Bitcoin (Tokenization; Sidechains; Root)

Ethereum (including EVM)

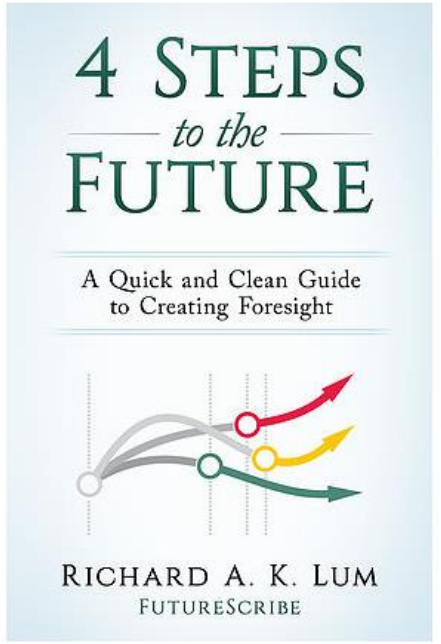
Hyperledger (IBM, Accenture, et al)

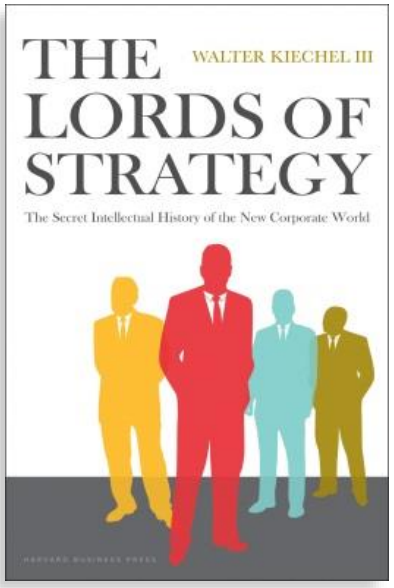
Eris Industries (PwC Partnership)
Tendermint

Gov Coin Systems (UK)

Books

- ***Teaching about the Future*** *(Textbook)*
  Thinking about the Future
  By Andy Hines & Peter Bishop
- ***4 Steps to the Future***
  By Richard (Kaipo) Lum
- ***The Lords of Strategy***
  By Walter Kiechel

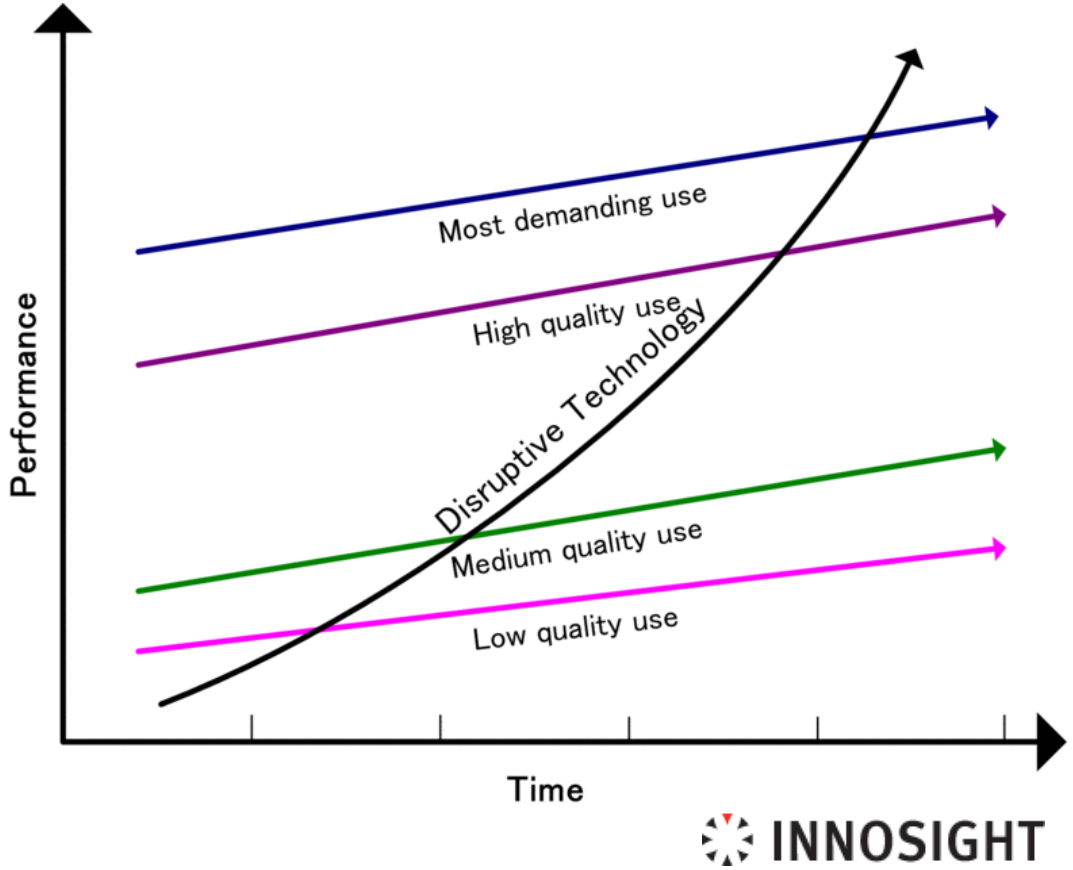




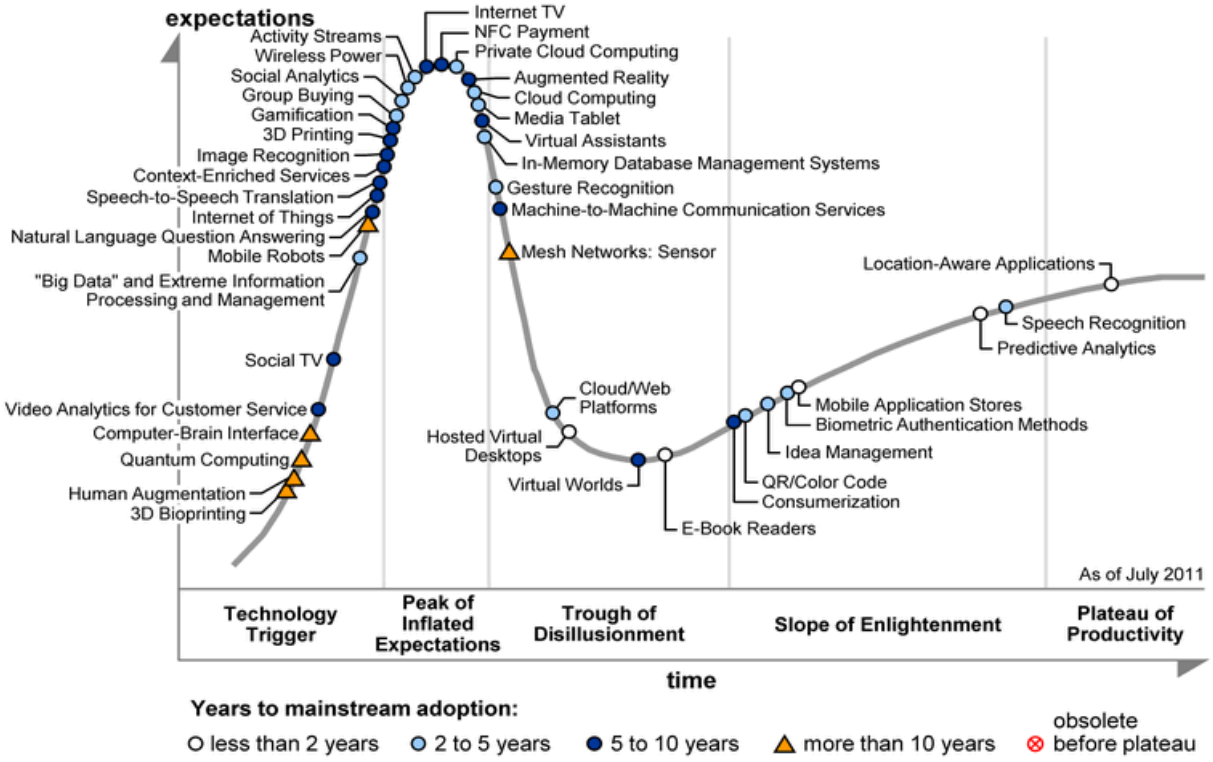
Executive Level Foresight Training

- *University of Houston Studies of Future Program*
- Foresight Education and Research Network (FERN)

Hype versus *the Slow pace of Fast Change*



INNOSIGHT



Gartner

Search + Accessing Intelligence with xAPI Pathways

What if Experience Graph dynamics find Adoption?

Actor-Verb-Subject

"I did this…"

Learning Record Store (LRS)

- ❑ Individual Control over Access to Learning Data

2017 – 2030

- ❑ ML to Datasets
  Data store to Prescriptive Solution
- ❑ Knowledge Graphs
- ❑ Cognitive Solutions
- ❑ Battles for Control
- ❑ Equity + Digital Divides
- ❑ Govt Value in Unlocking Workforce Potential