

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

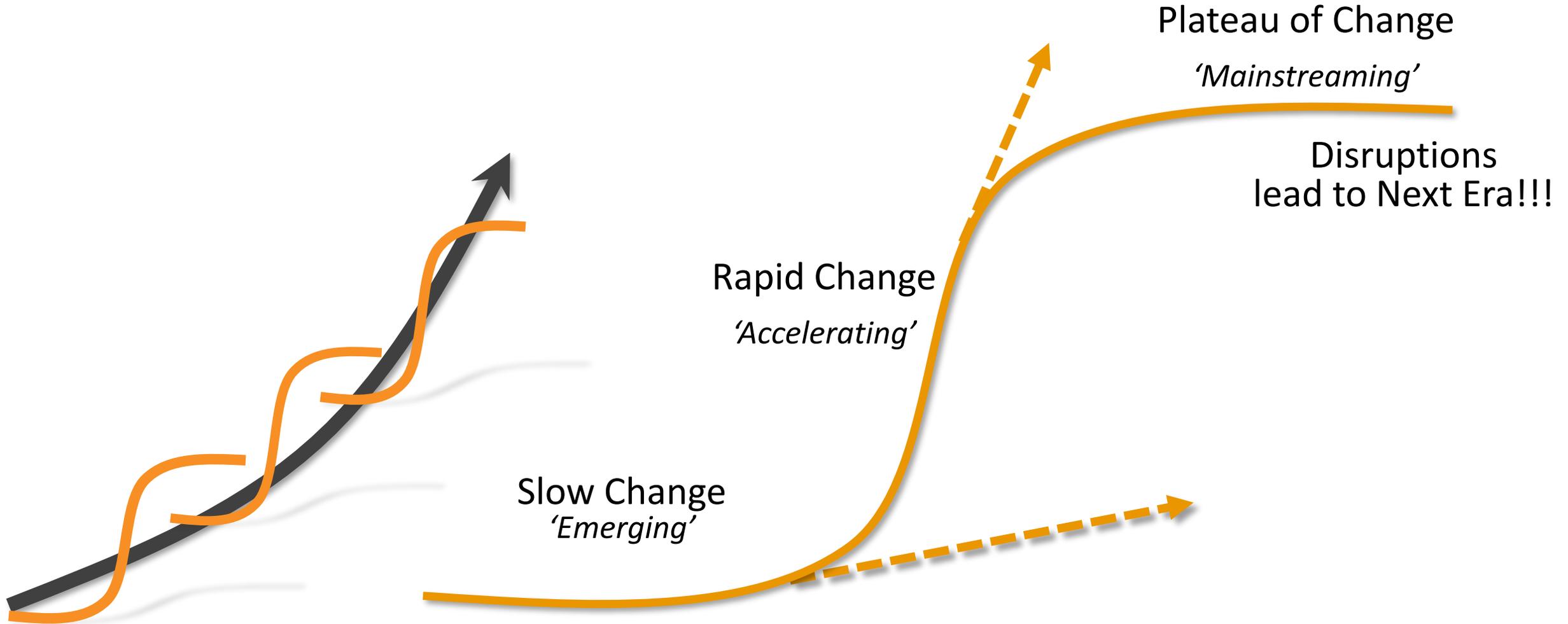


Next
ten years

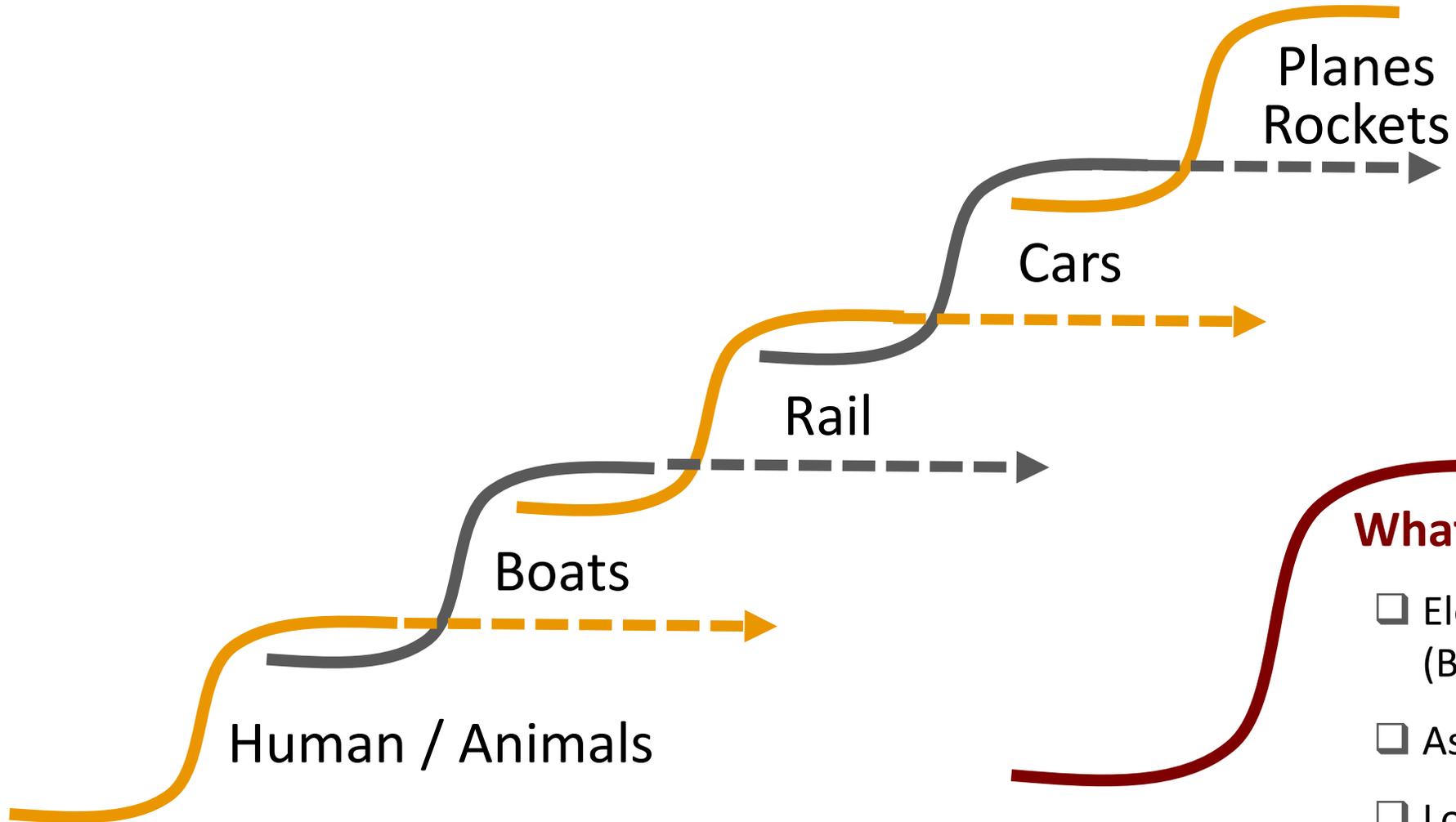
2017-2027



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



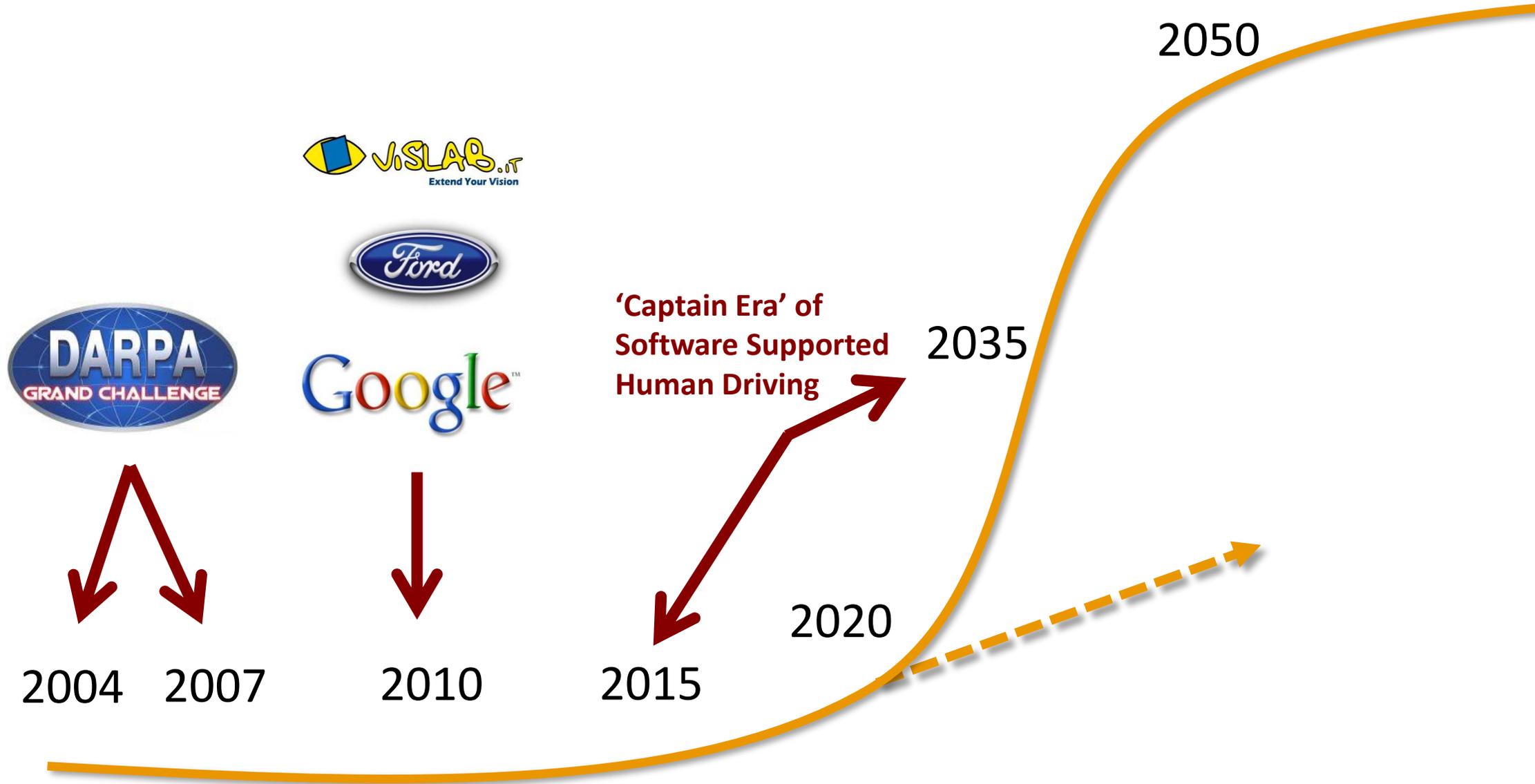
Eras of Mobility



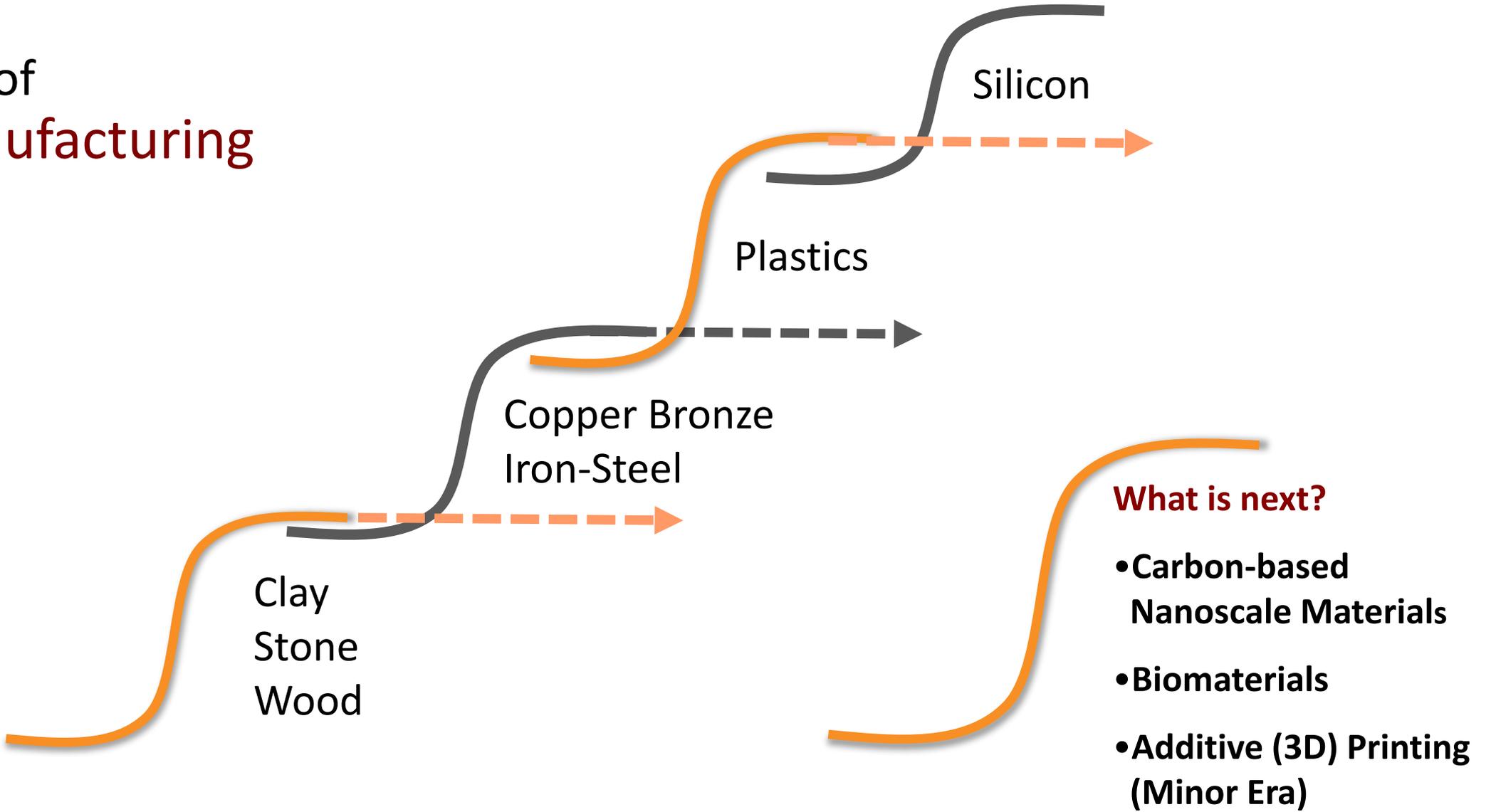
What is next?

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

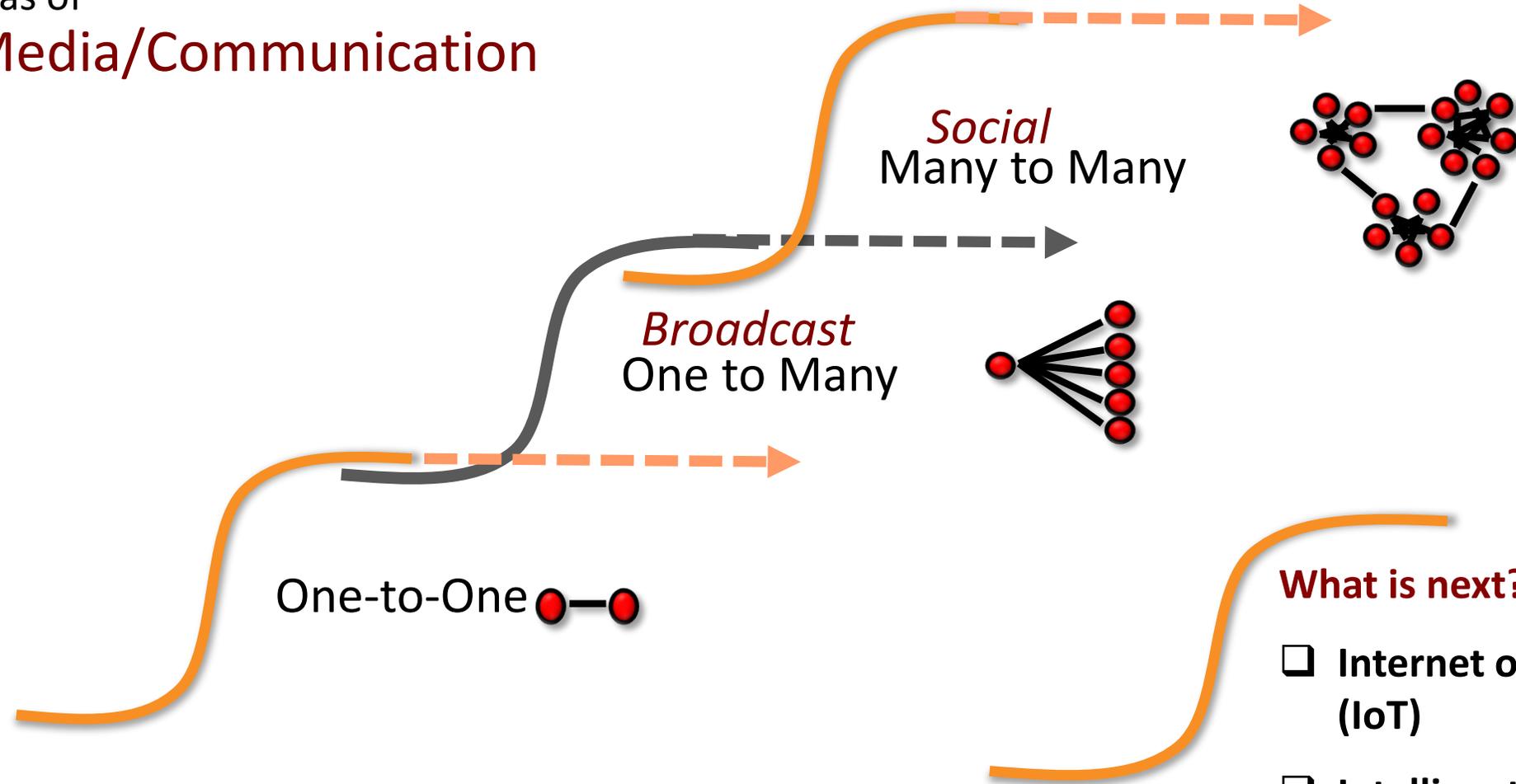
Monitoring & Anticipating Changes



Eras of Manufacturing



Eras of Media/Communication

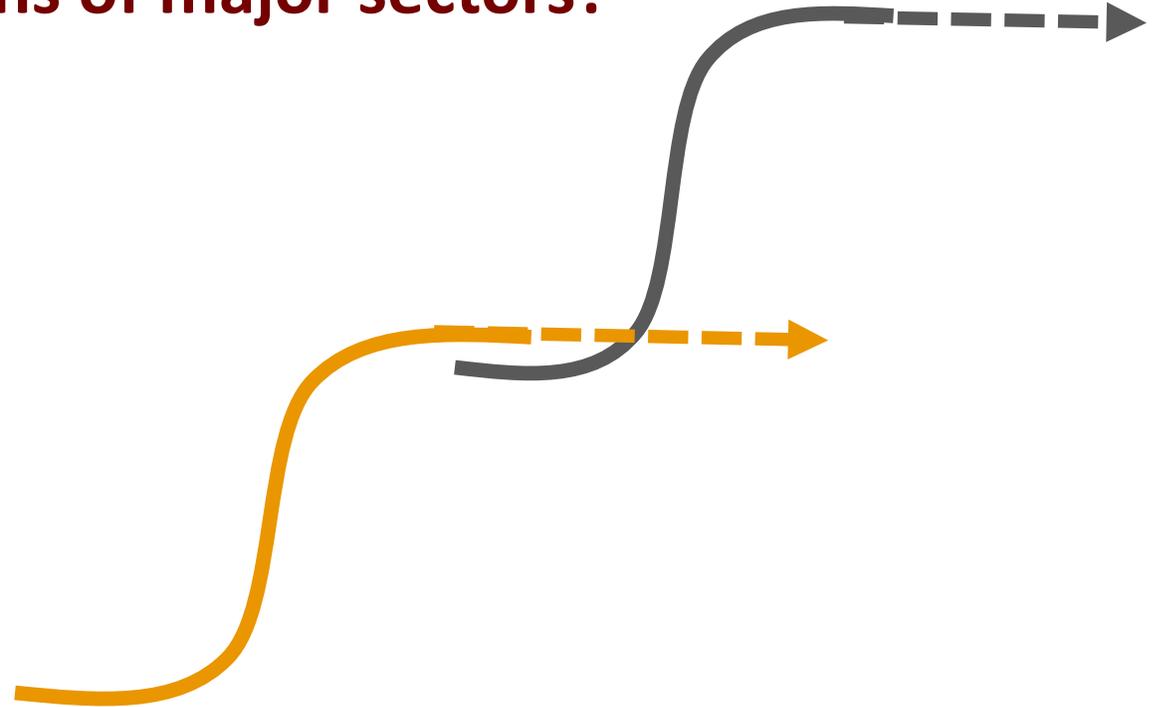


What is next?

- 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

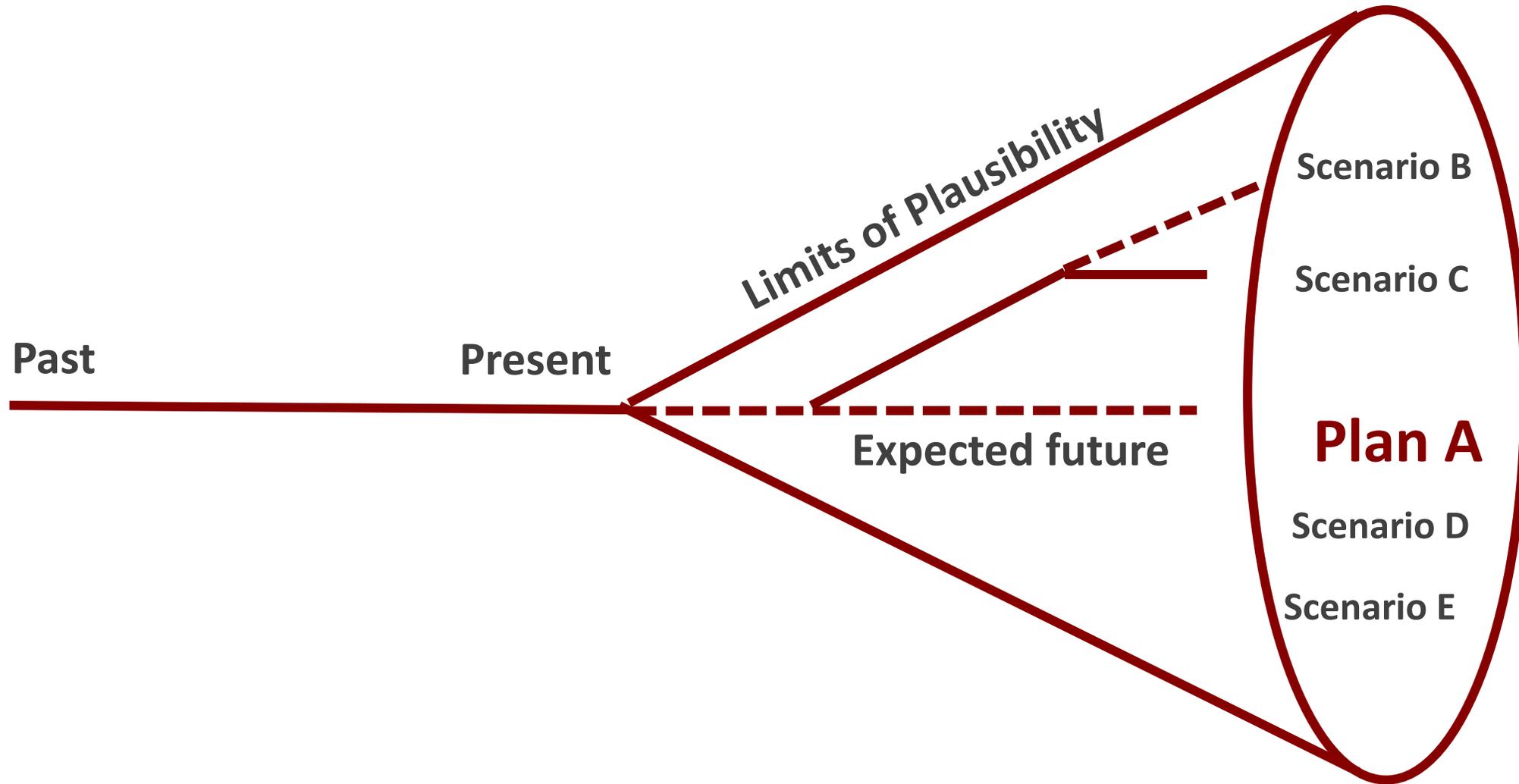


Tapping My Inner “Futurist”?



Foresight 101: Cone of Plausibility

Multiple Outcomes, Multiple Time Horizons



A close-up photograph of a person's hand holding a small, rectangular white paper strip against a solid black background. The paper strip is slightly tilted and has a thin white border. The text on the strip is printed in a clean, black, sans-serif font. The hand is visible on the left side, with the thumb and index finger gripping the edge of the paper.

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**

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

**Continued
Growth**

**Disciplined
- Constrained**

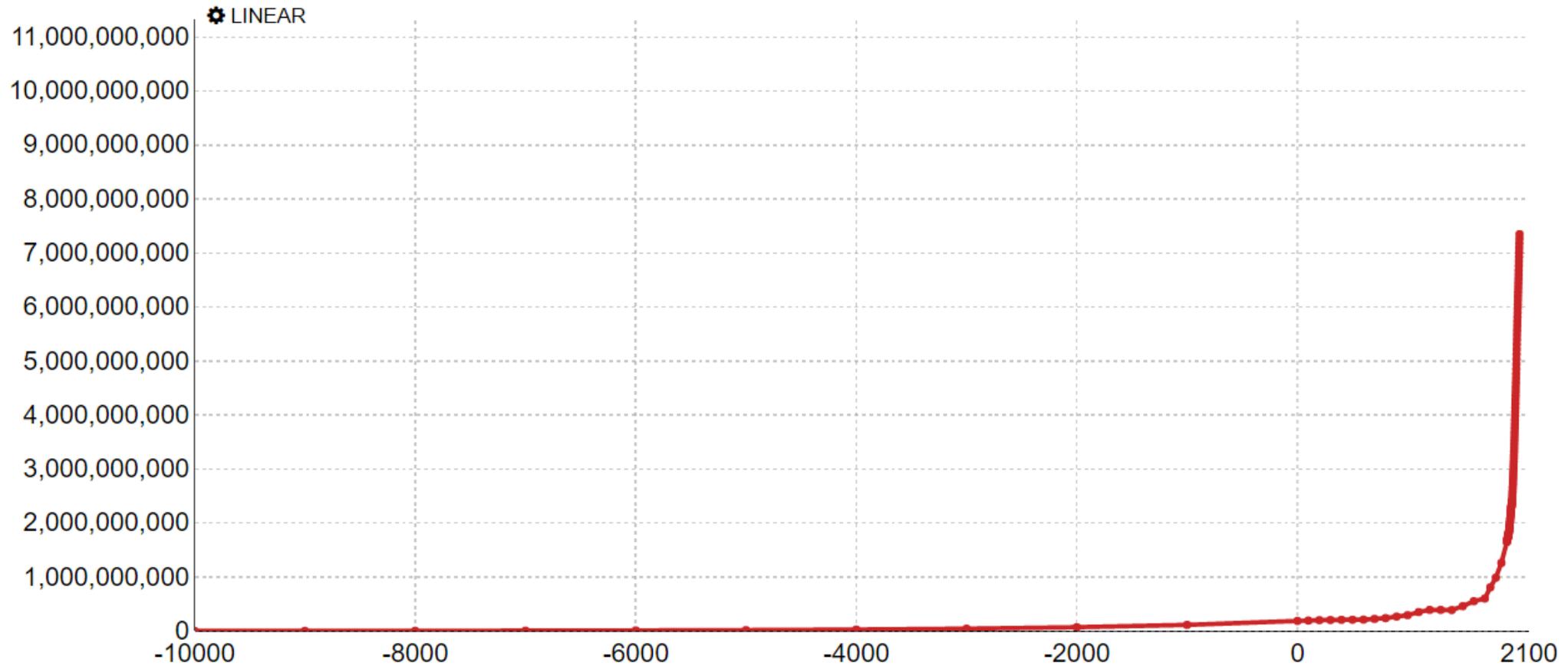
Transformed

**Decline
- Collapse**

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

World - Medium Projection – UN Population Division (2015 revision)

Our World In Data - World Population over 12000 years



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*

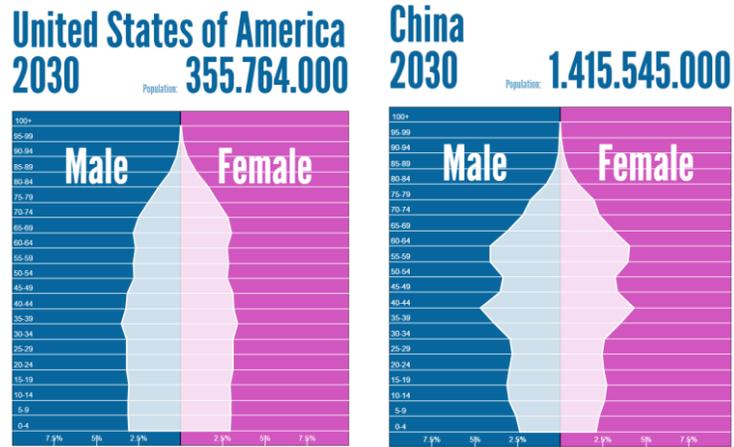


Drivers of Change



Foresight Culture

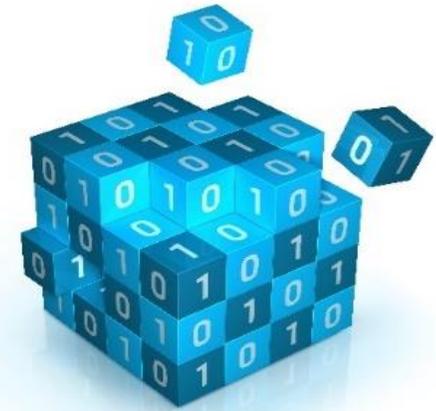
Global Drivers of Change 2017 – 2050



Demographic Destinies

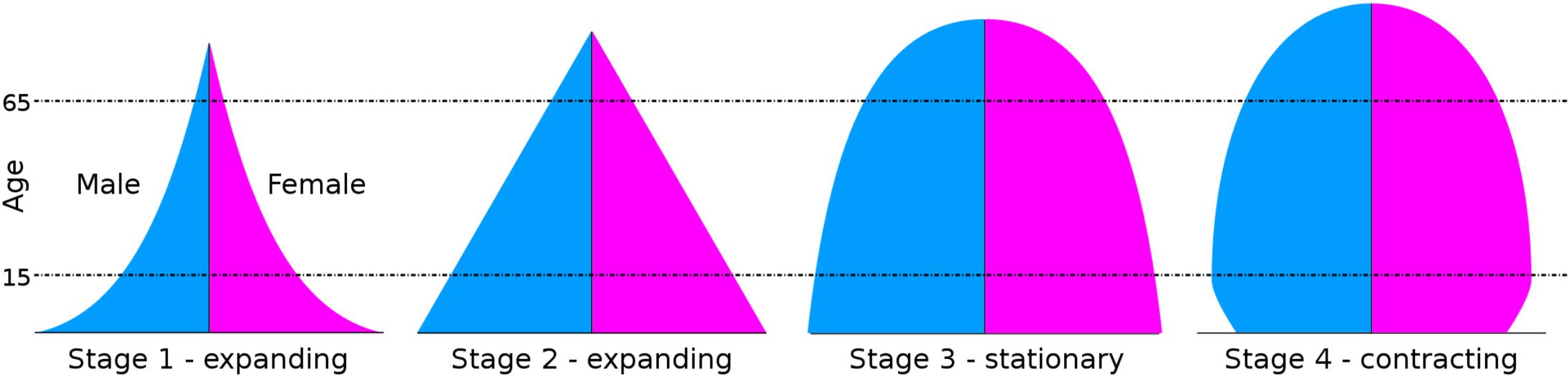


Working with Intelligent Systems



Blockchain & Smart Contracts for Trusted Transactions

Globalization Reshaped by Demographic Realities



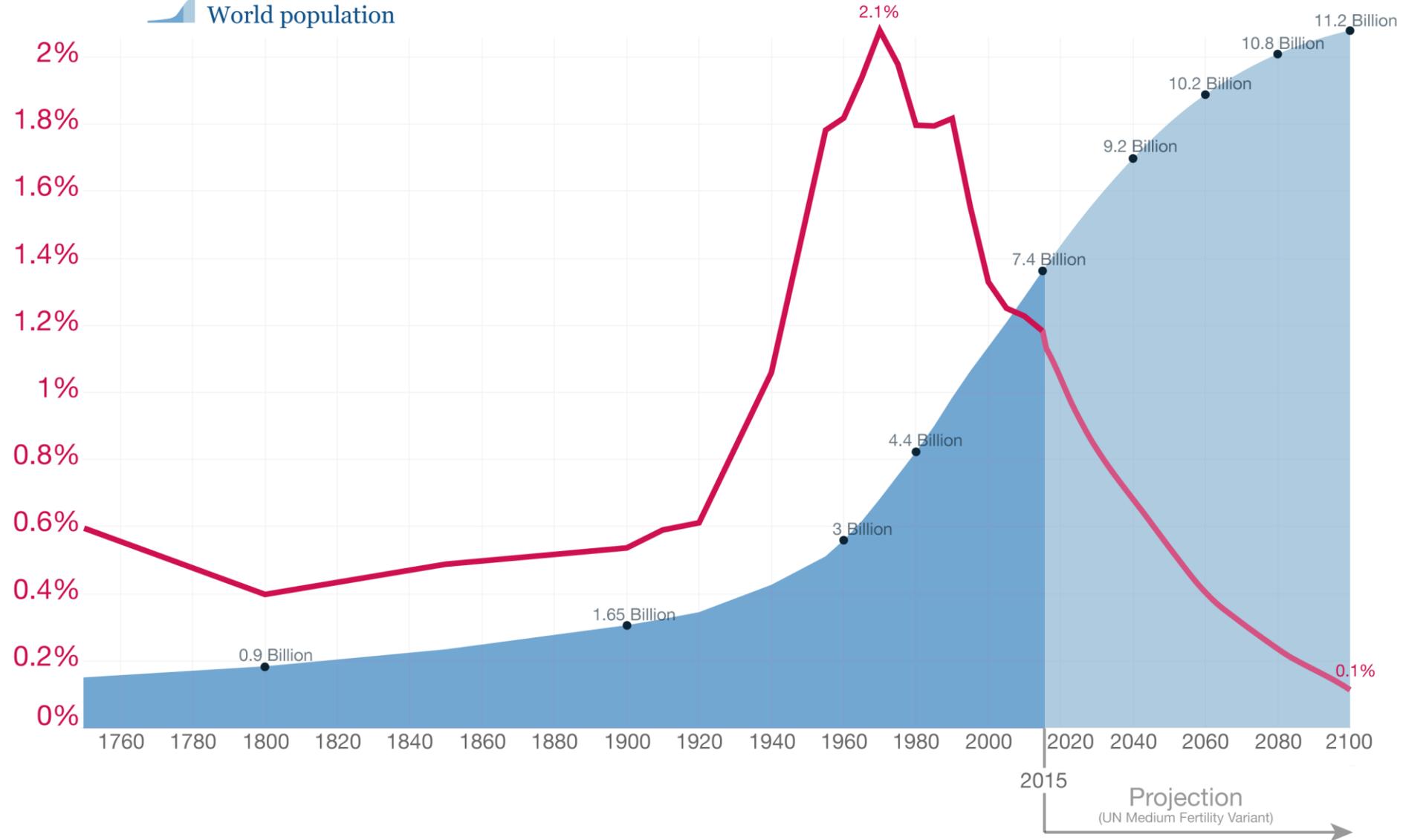
**Rural vs Urban
Industry Make-up**

**Labor Markets
Infrastructure Spending**

**Education and Skilled Labor
Electorate Sentiment**

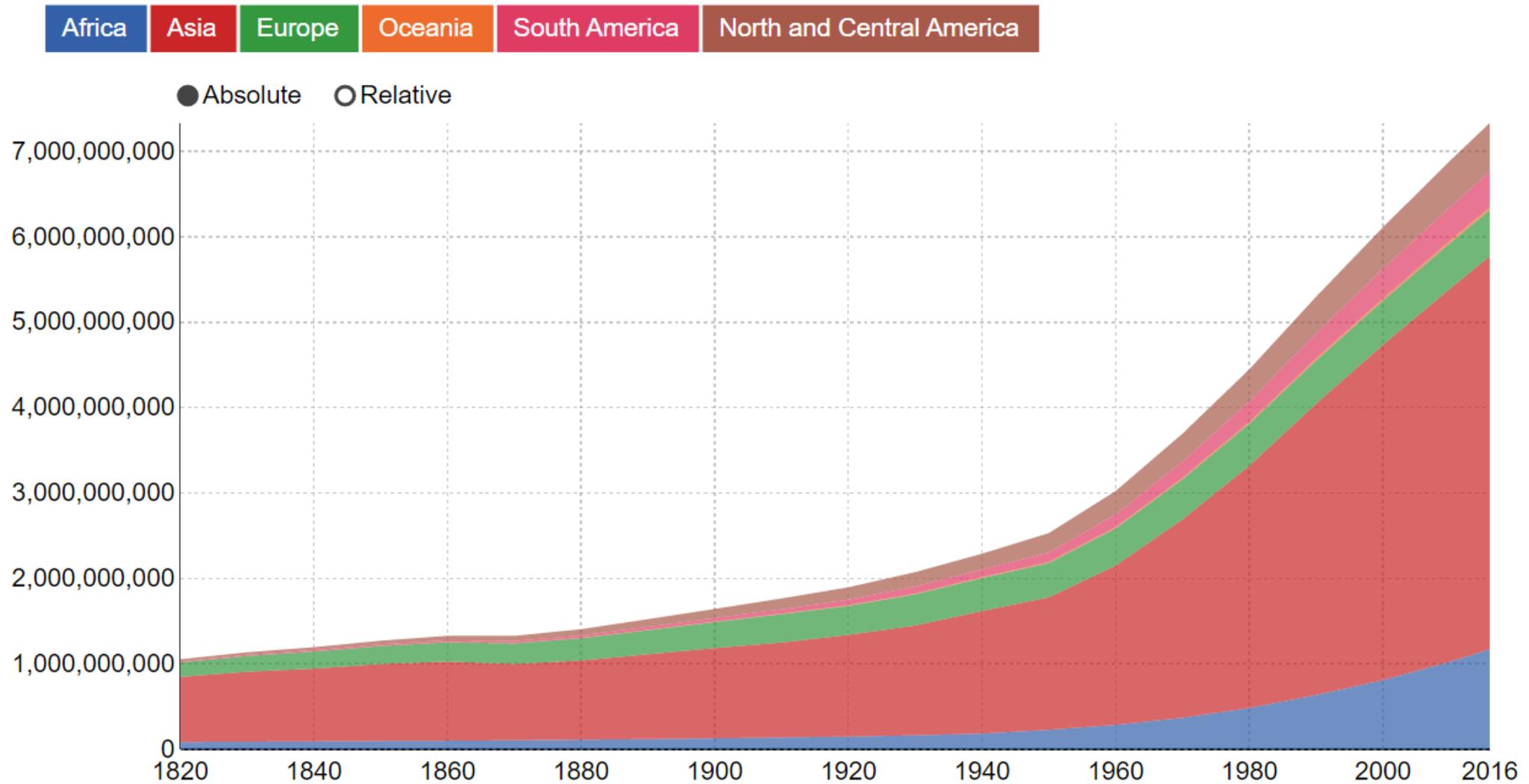
World population growth, 1750-2100

 Annual growth rate of the world population
 World population



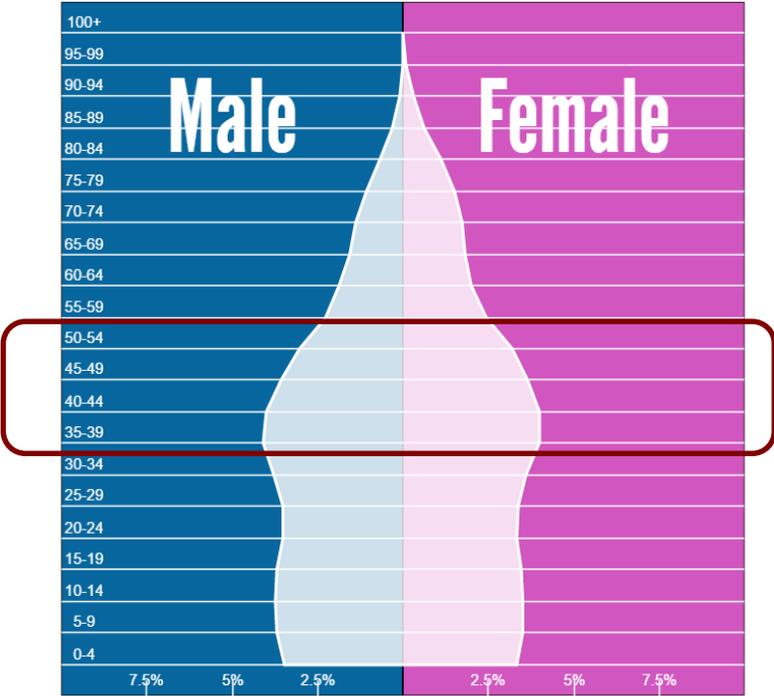
Data sources: Up to 2015 OurWorldInData series based on UN and HYDE. Projections for 2015 to 2100: UN Population Division (2015) – Medium Variant. The data visualization is taken from [OurWorldInData.org](https://ourworldindata.org). There you find the raw data and more visualizations on this topic.

World population by world regions, 1820 to 2016

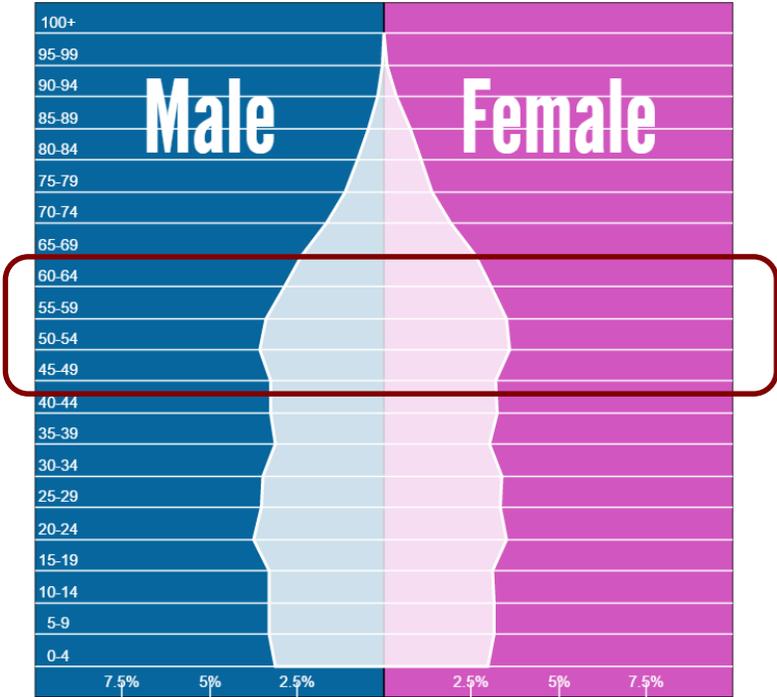


U.S. = Aging Boomers + Fading *Demographic Dividend*

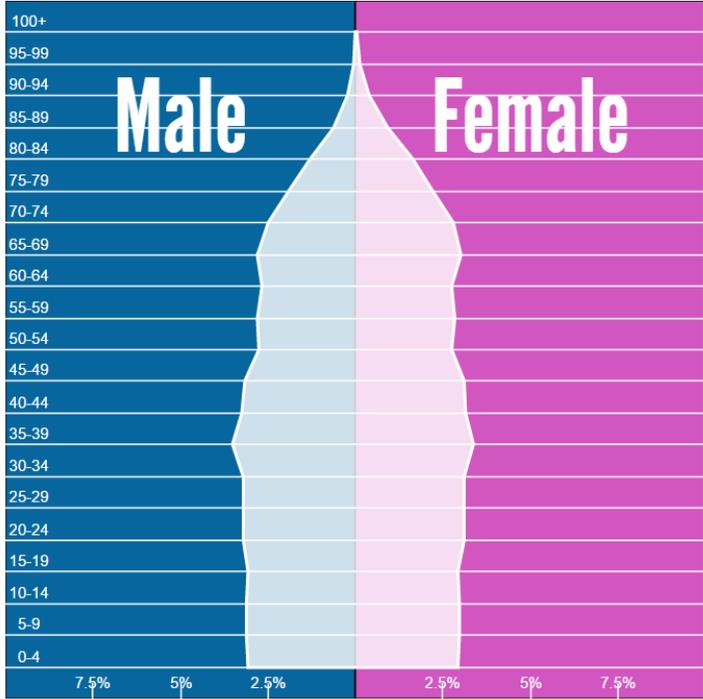
United States of America
2000
Population: 282.895.000



United States of America
2015
Population: 321.773.000



United States of America
2030
Population: 355.764.000



Source: populationpyramid.net

UNITED STATES ECONOMIC ACTIVITY, SPLIT IN HALF

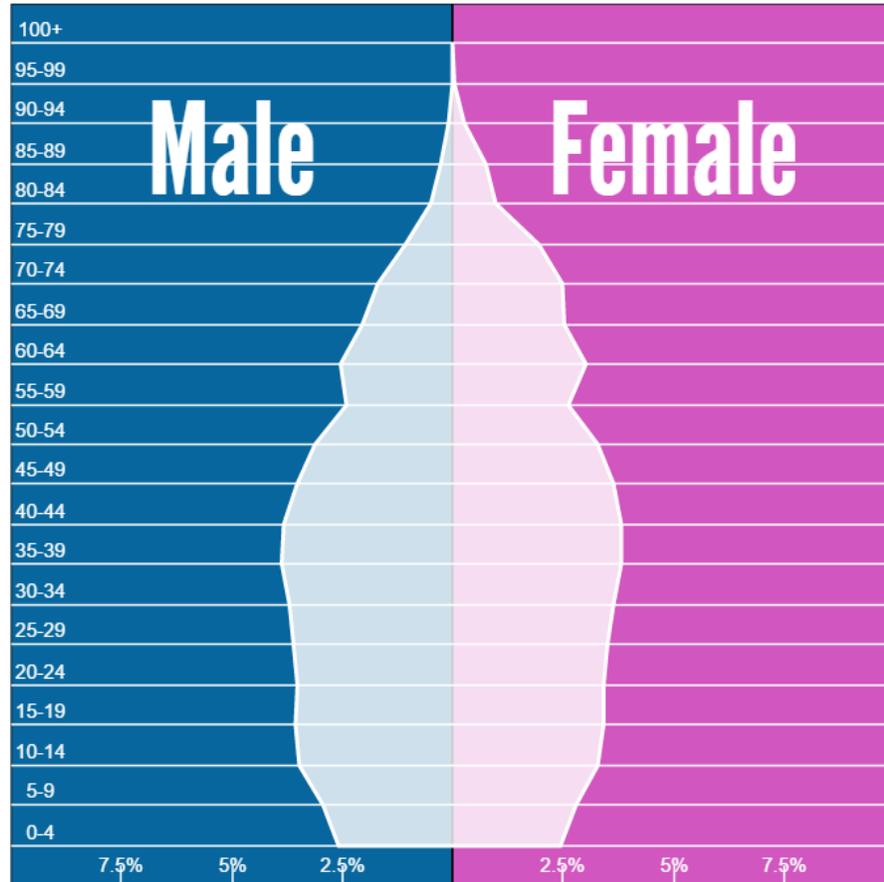


Rural = Aging
Metro = Young

Europe's Demographic Liability

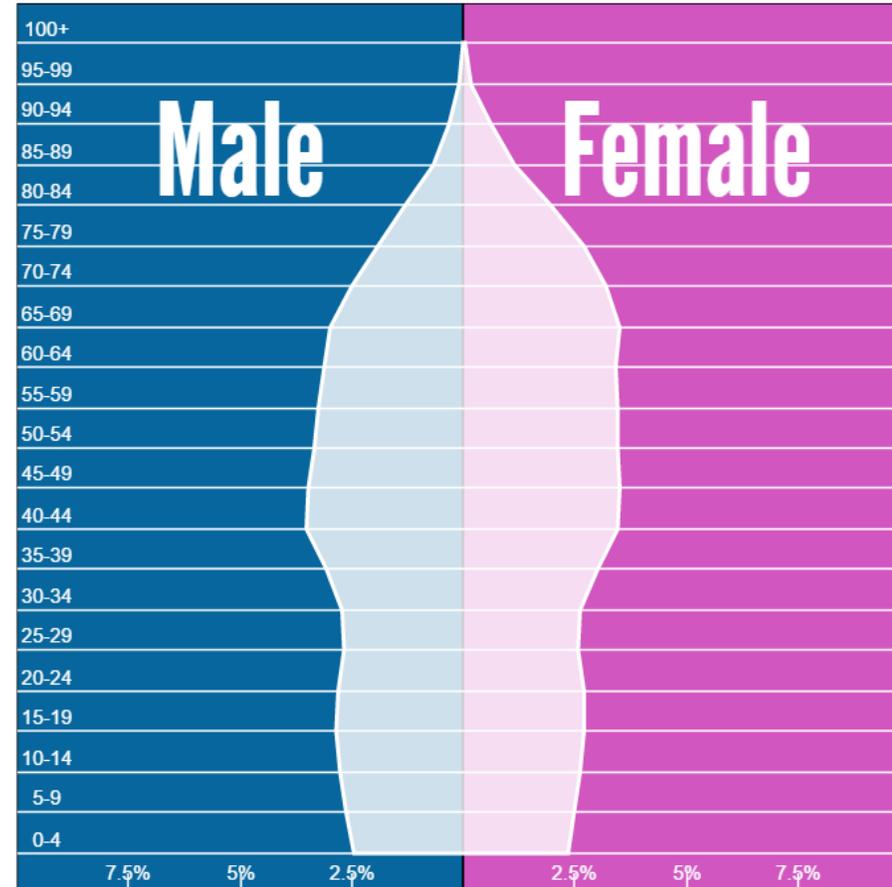
EUROPE 2000

Population: **726.407.000**



EUROPE 2030

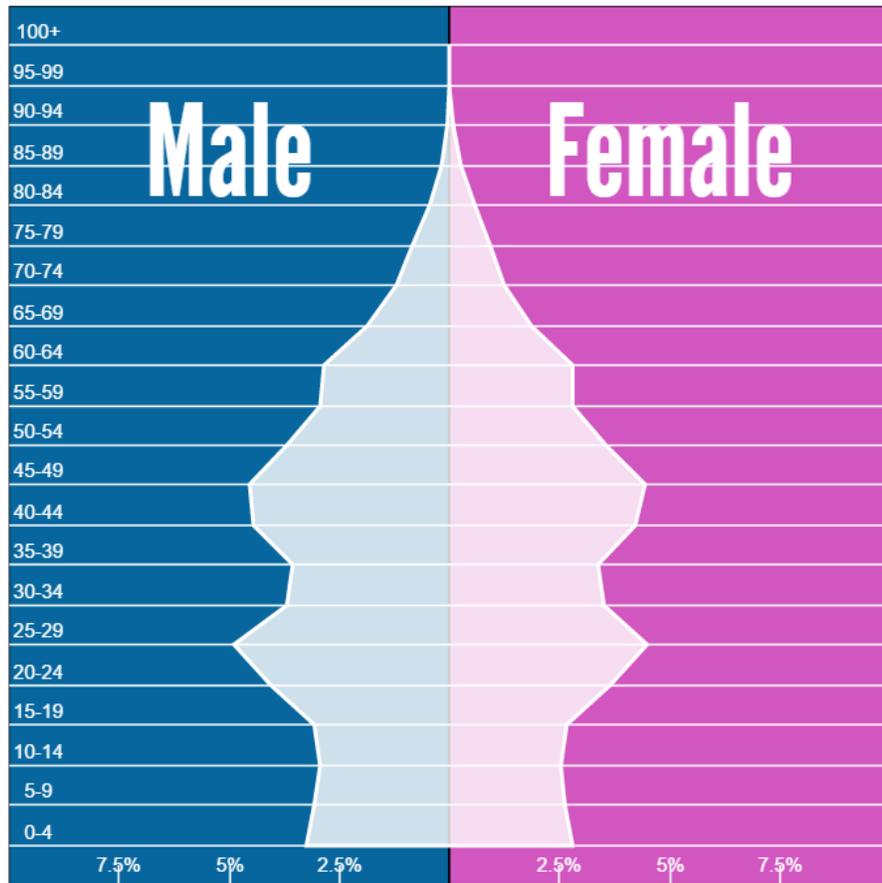
Population: **733.929.000**



Global Challenges: Workforce Constraints + Delayed Consumerization

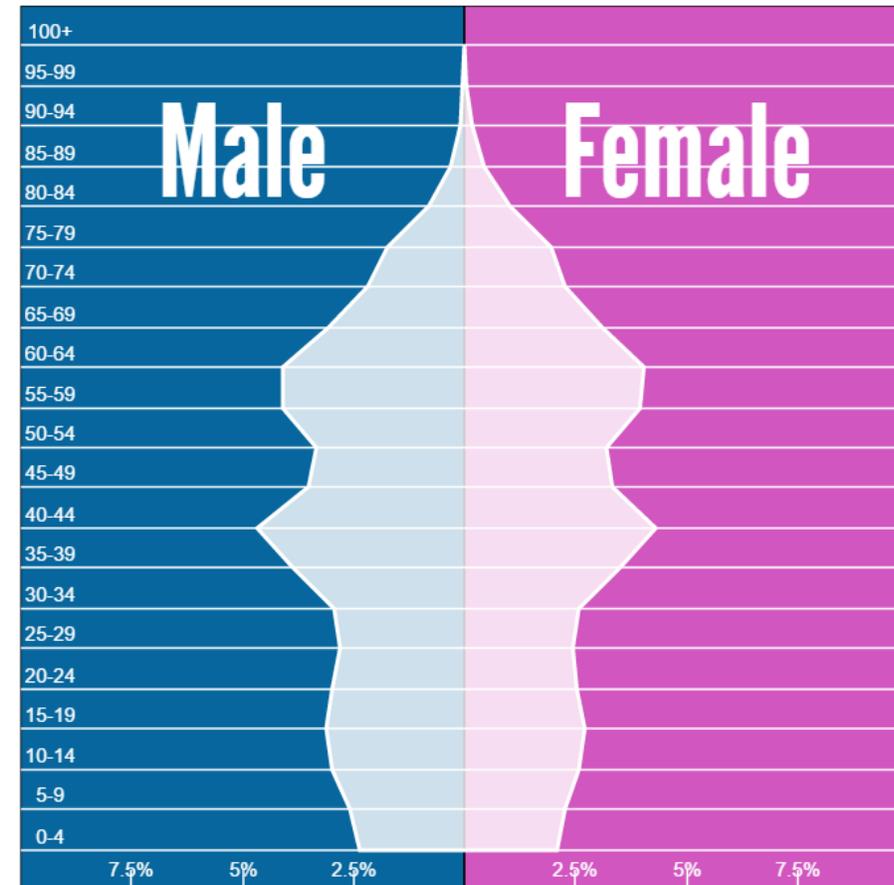
China 2015

Population: **1.376.048.000**



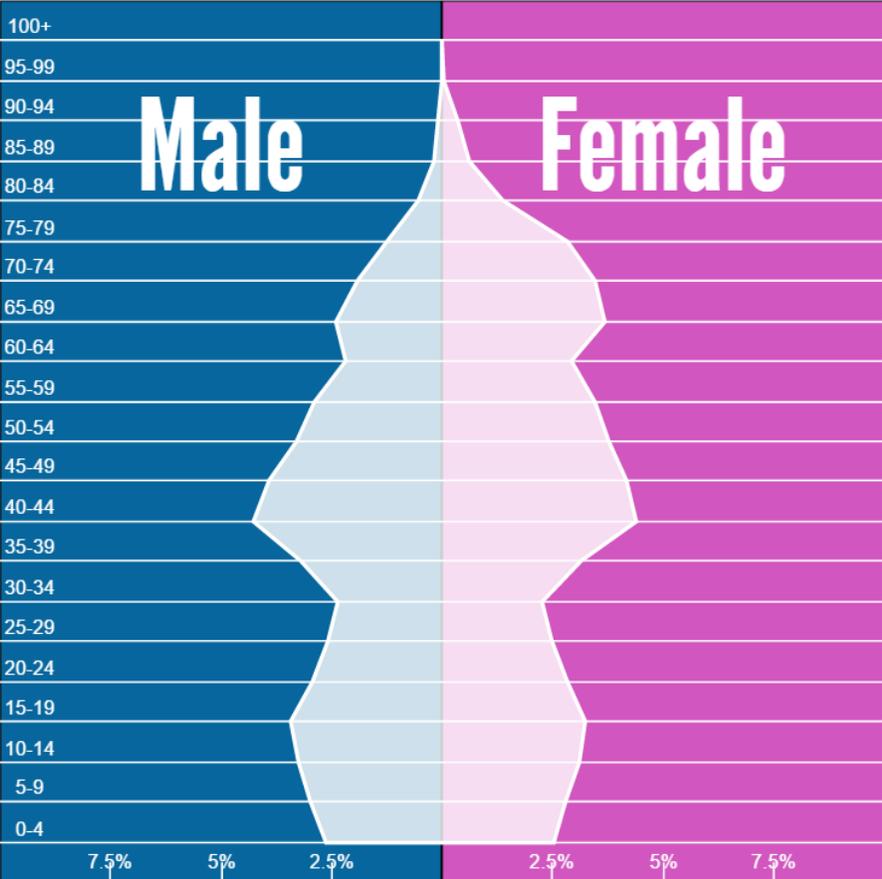
China 2030

Population: **1.415.545.000**

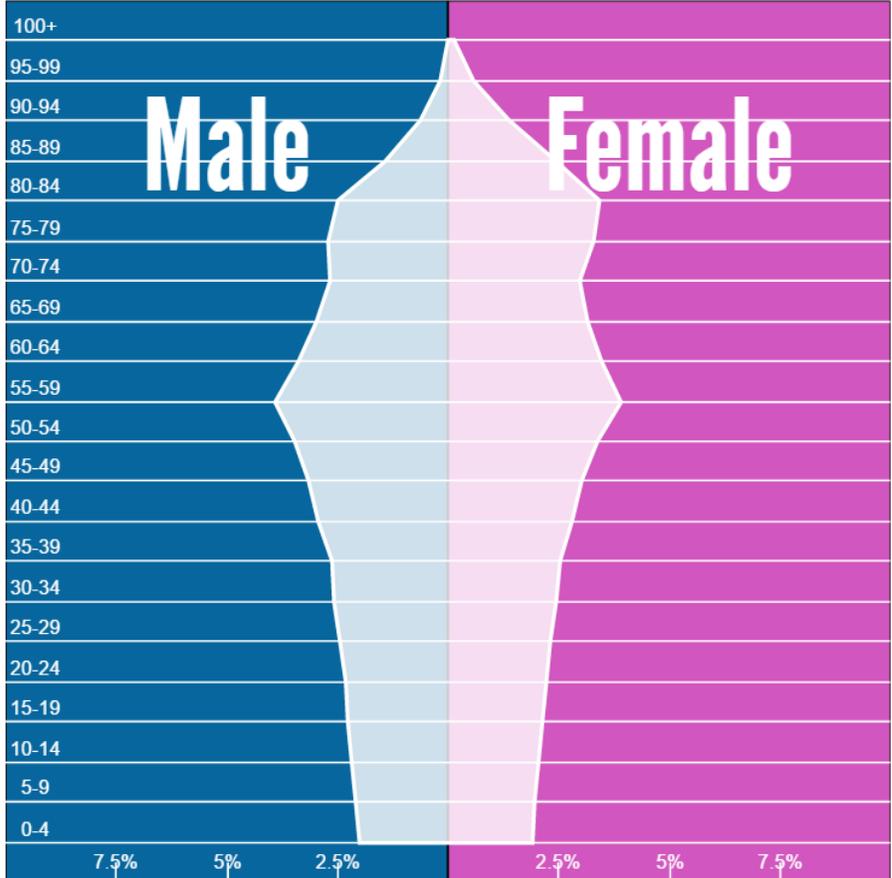


Global Challenges: Aging Electorates inside Regional Powers

Russian Federation 2030 Population: 138.652.000

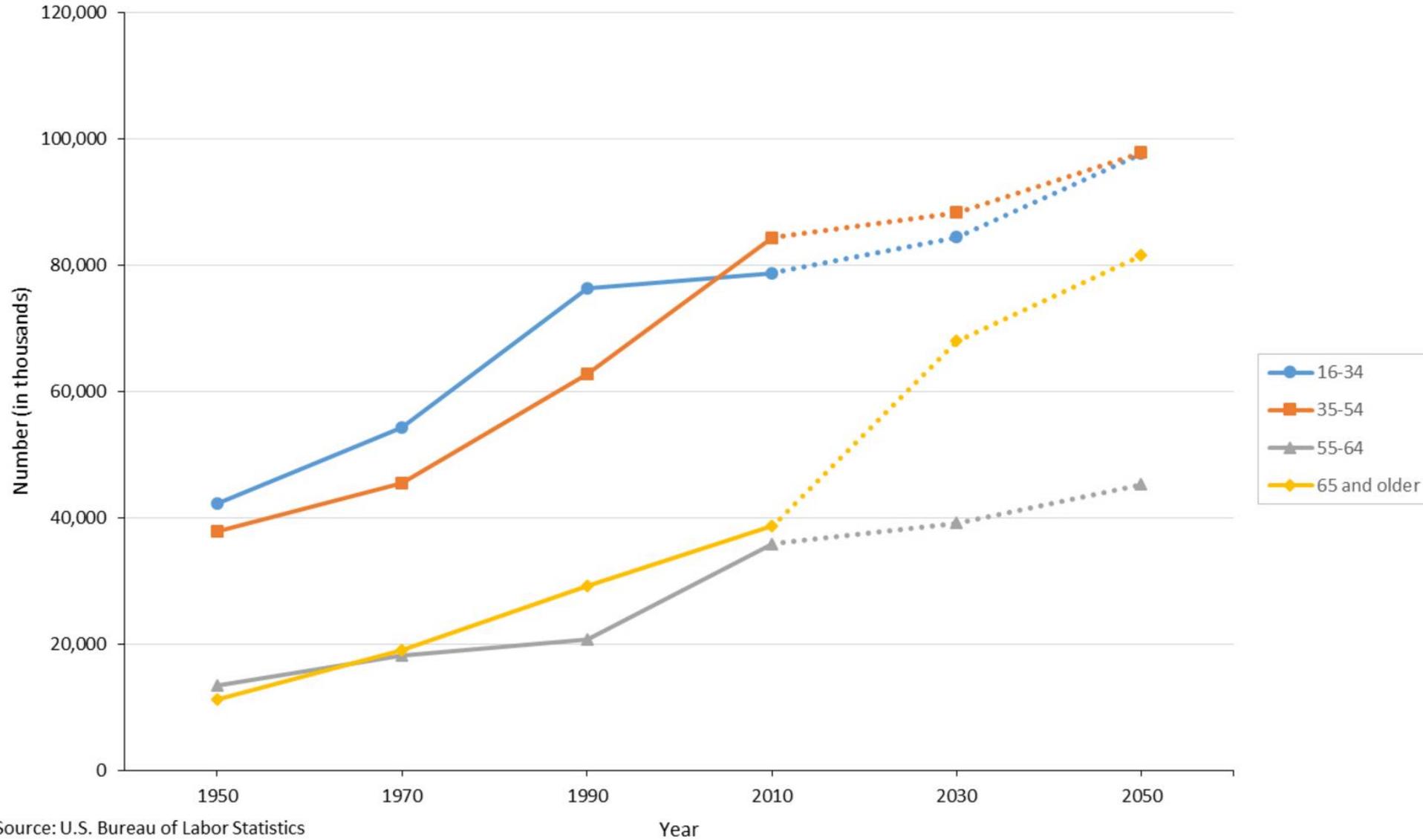


Japan 2030 Population: 120.127.000



#1 Uncertainties of Employers + Workforce Composition

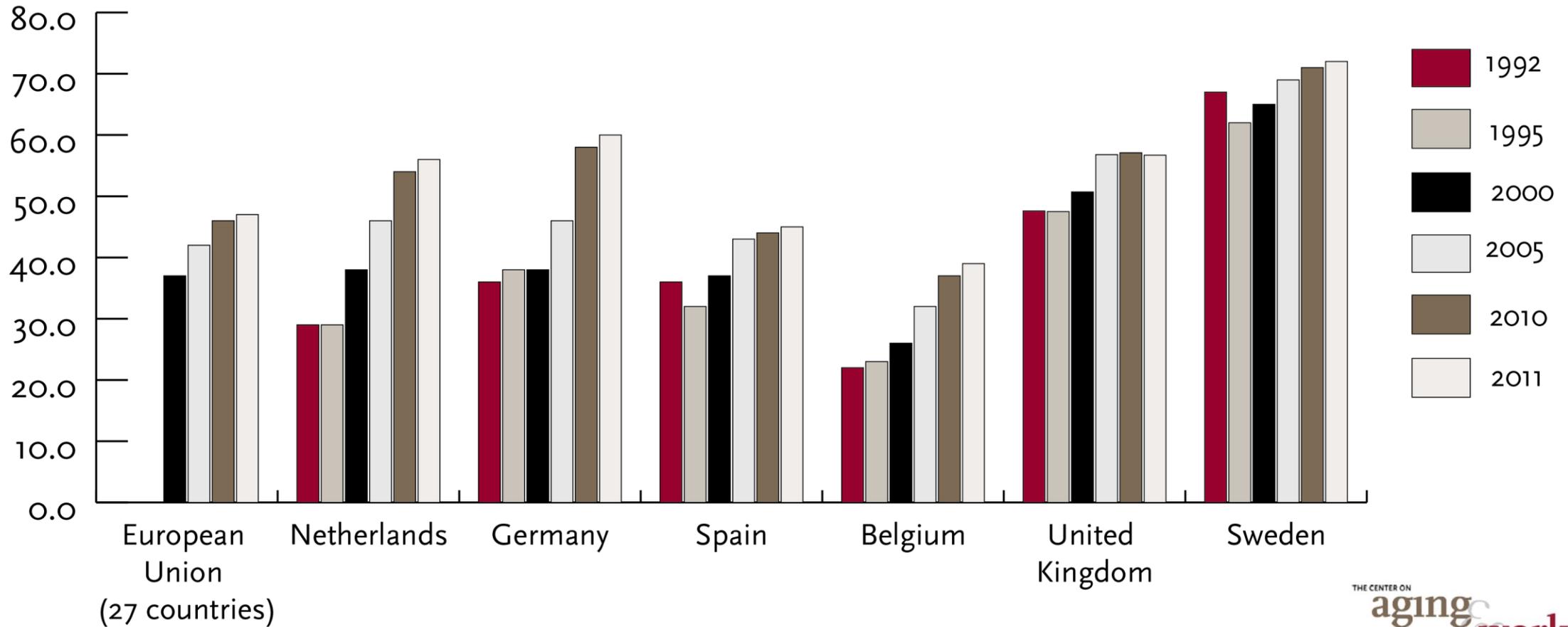
U.S. Civilian noninstitutional population by age group, 1950-2010 and projected 2030-2050



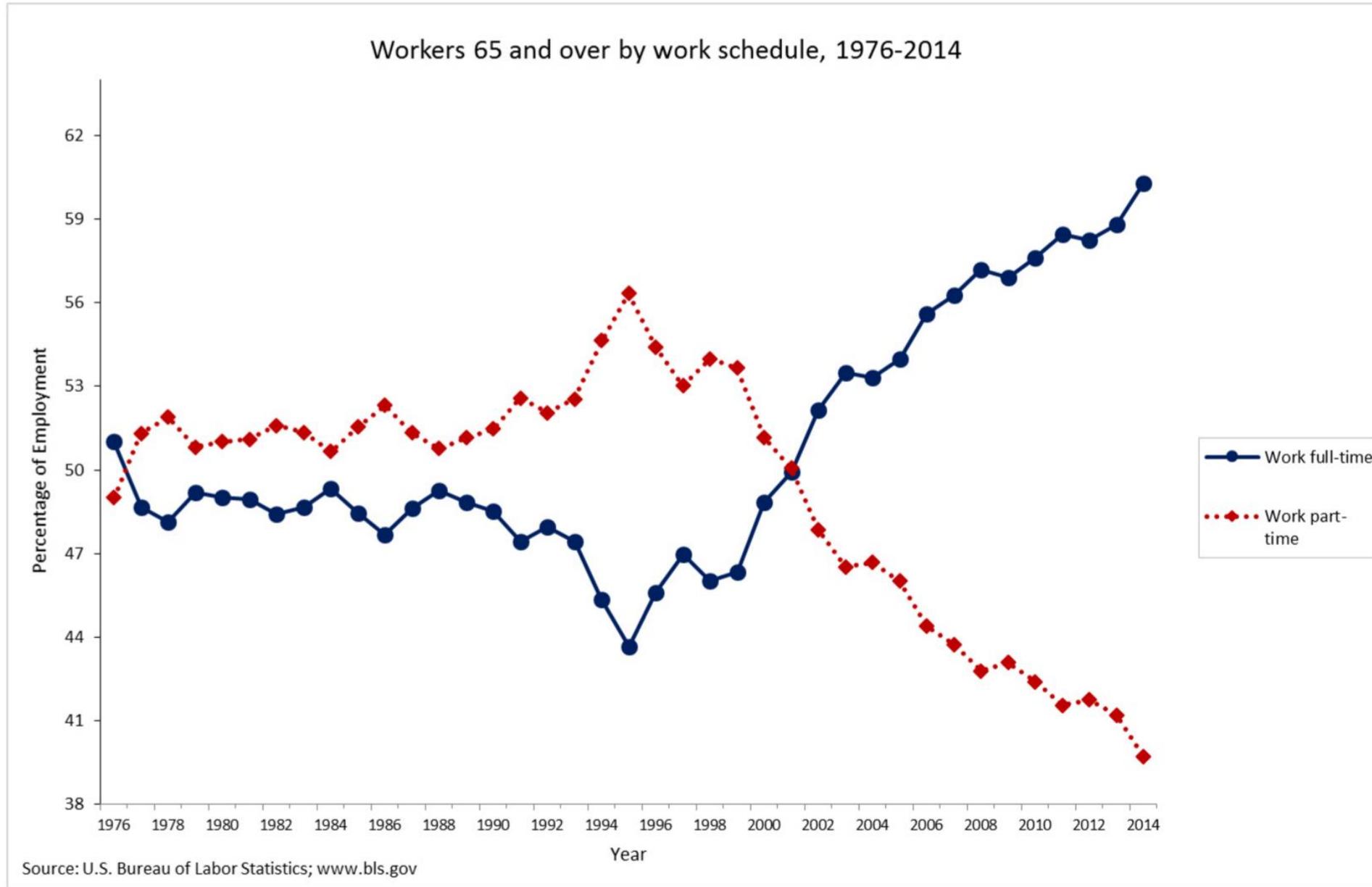
Source: U.S. Bureau of Labor Statistics

#2 Uncertainties of Retirement Waves

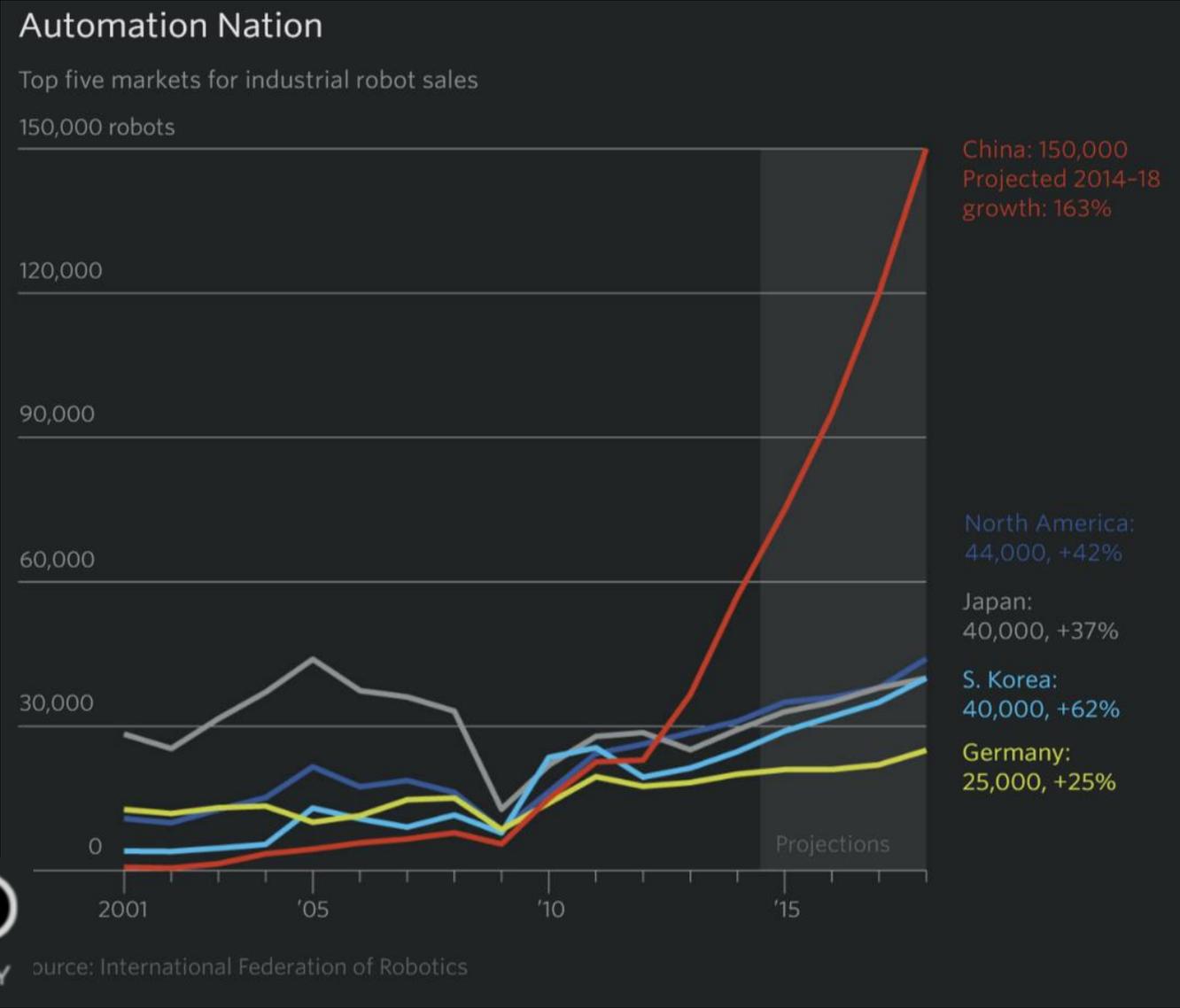
Fig 1: Percentages of people between the ages of 55 and 64 participating in the European workforce, from 1992 to 2011 (Eurostat, 2012)*.



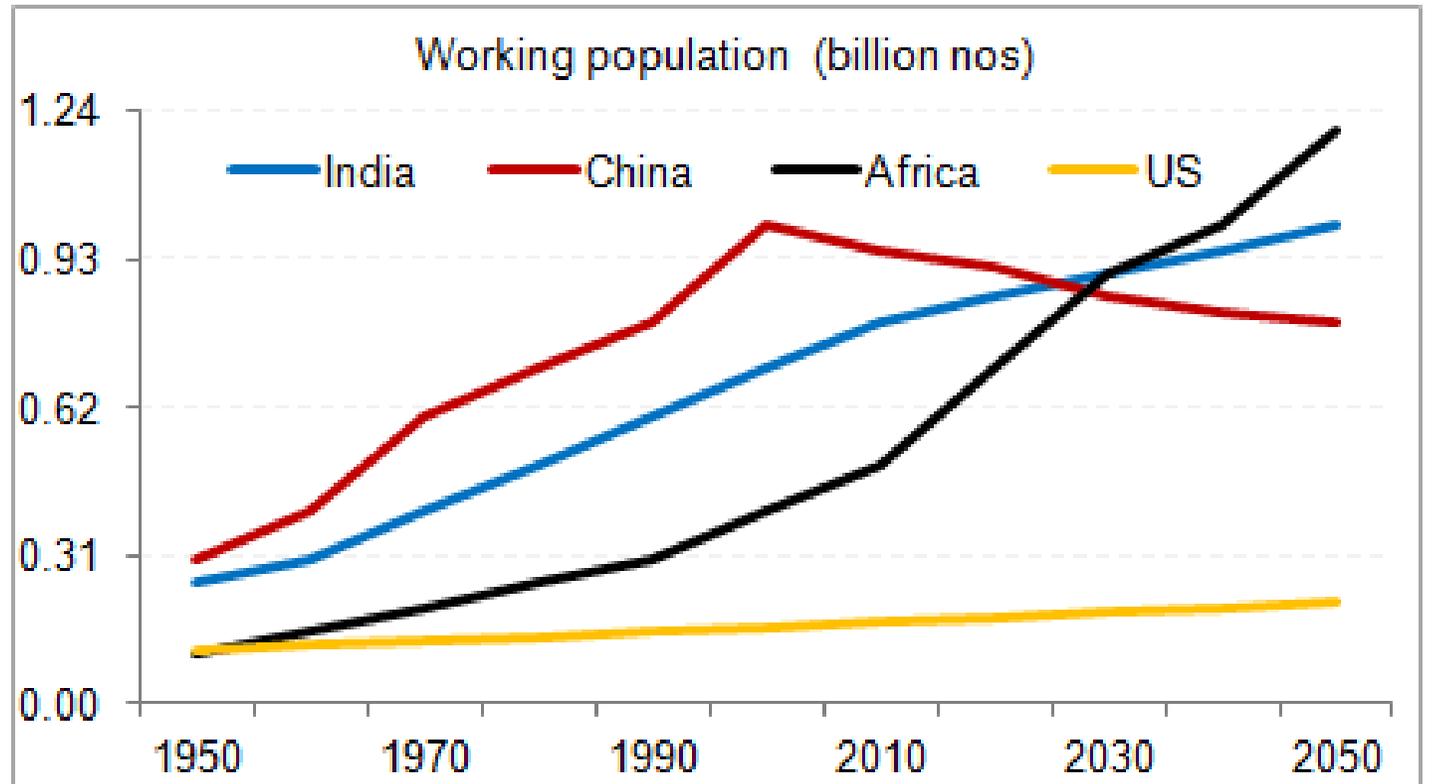
#3: Uncertainties of Full-time, Part-time vs Gig



#4: Uncertainties of Aging + Manufacturing Automation?



Uncertainties of Loyalty
Will Trans-national
Companies Seek Out
Demographic Dividends?



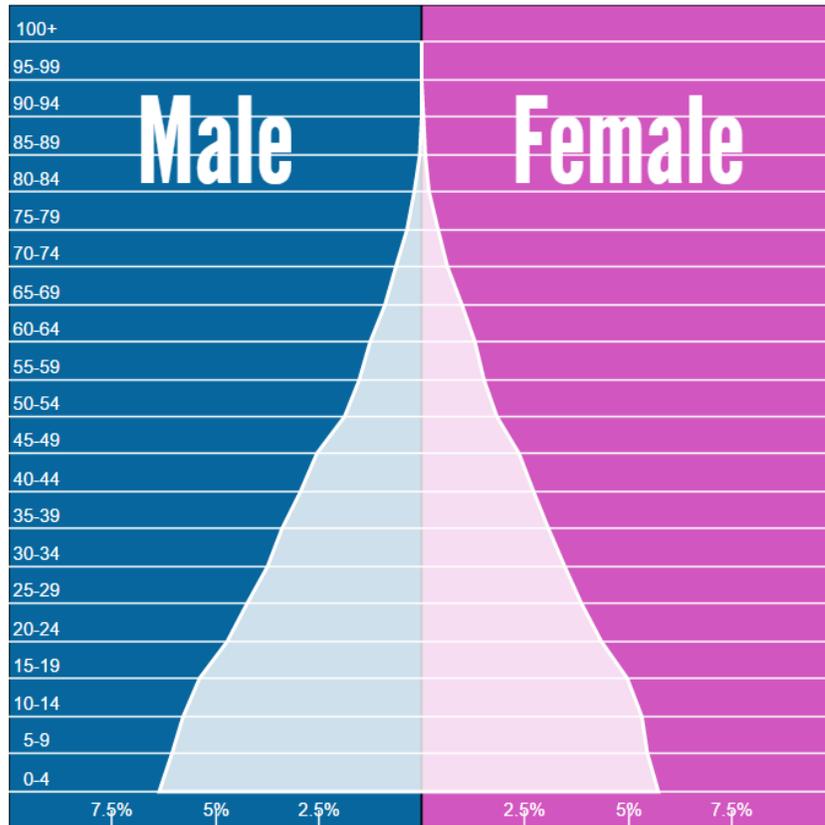
www.equitymaster.com

Source: Economist

Investing in Global *Demographic Dividends*

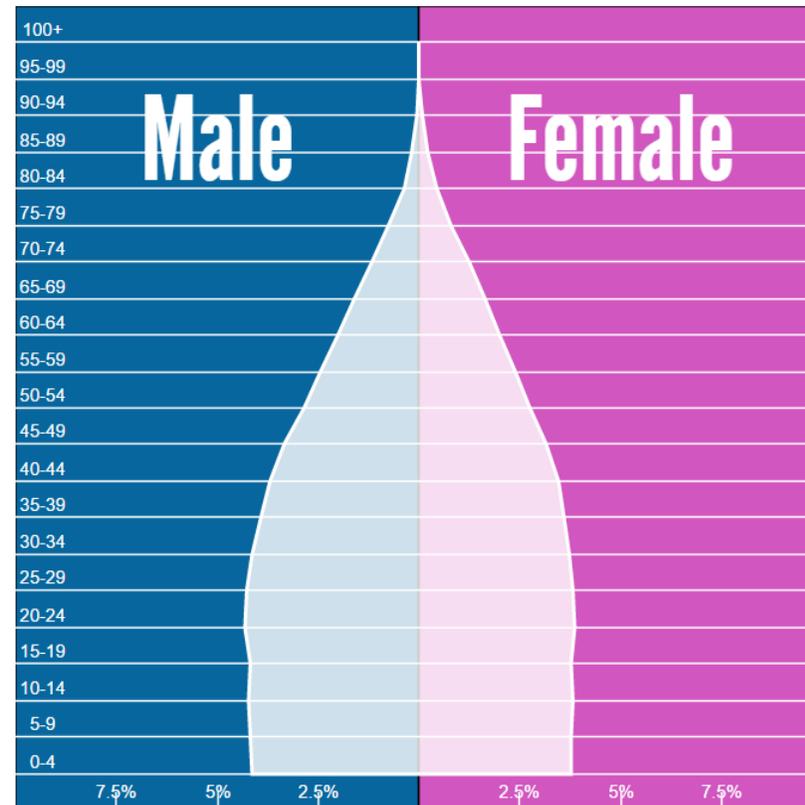
**India
2000**

Population: **1.053.481.000**



**India
2030**

Population: **1.527.657.000**

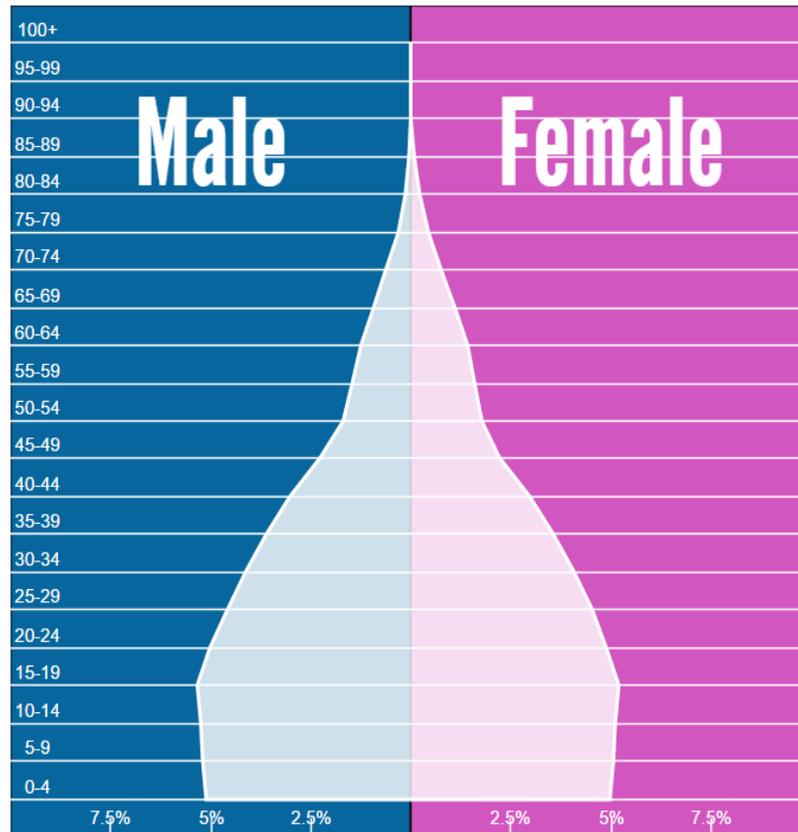


250 million joining workforce by 2030

Investing in Global *Demographic Dividends*

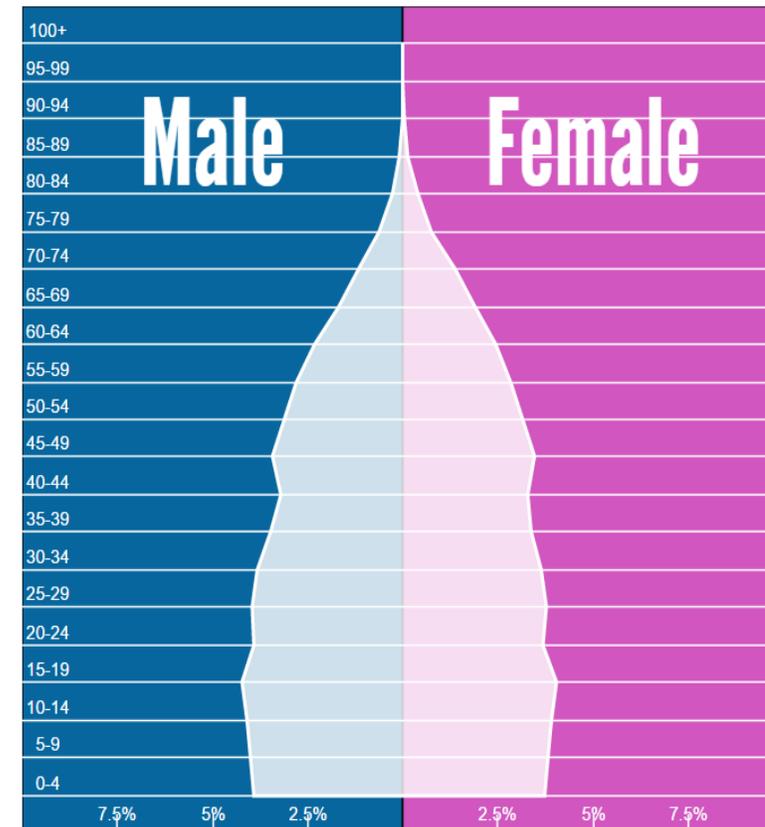
Indonesia 2000

Population: **211.540.000**



Indonesia 2030

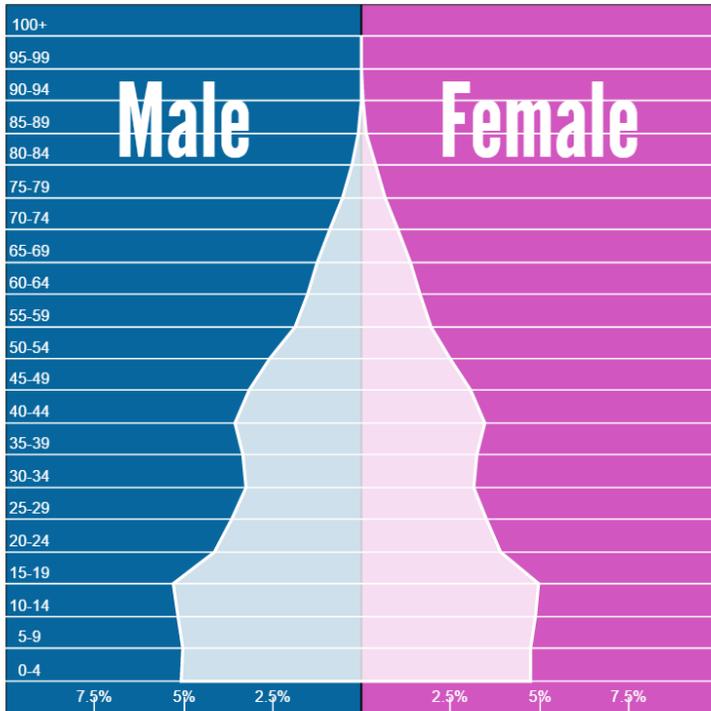
Population: **295.481.000**



Investing in Global *Demographic Dividends* – MENA

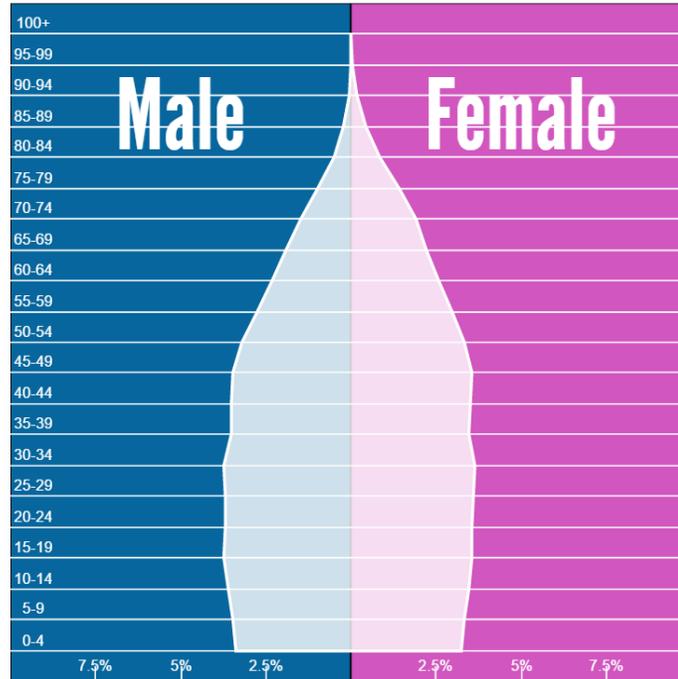
Egypt 2030

Population: **117.101.000**



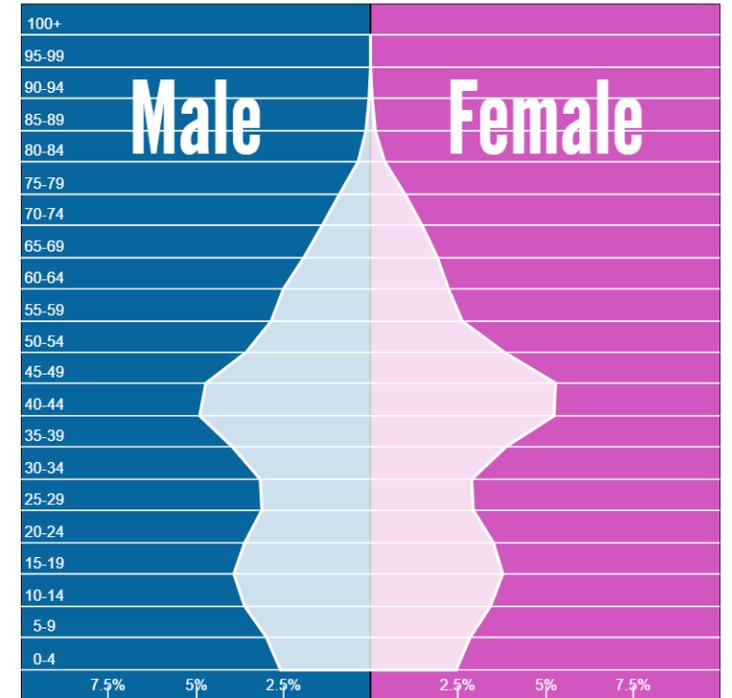
Turkey 2030

Population: **87.716.000**



Iran (Islamic Republic of) 2030

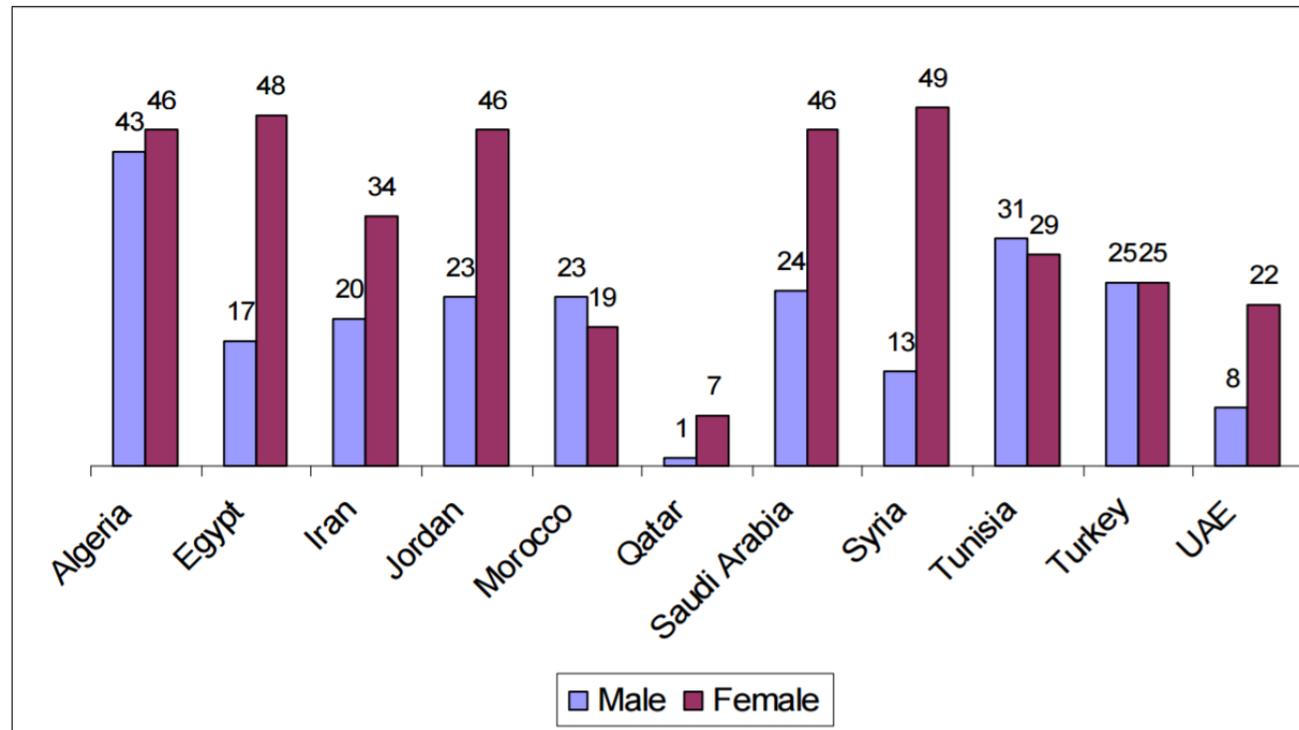
Population: **88.528.000**



The Lingering (Global) Challenge of Youth Unemployment

Youth Unemployment Rates by Sex

Percent of labor force ages 15 to 24

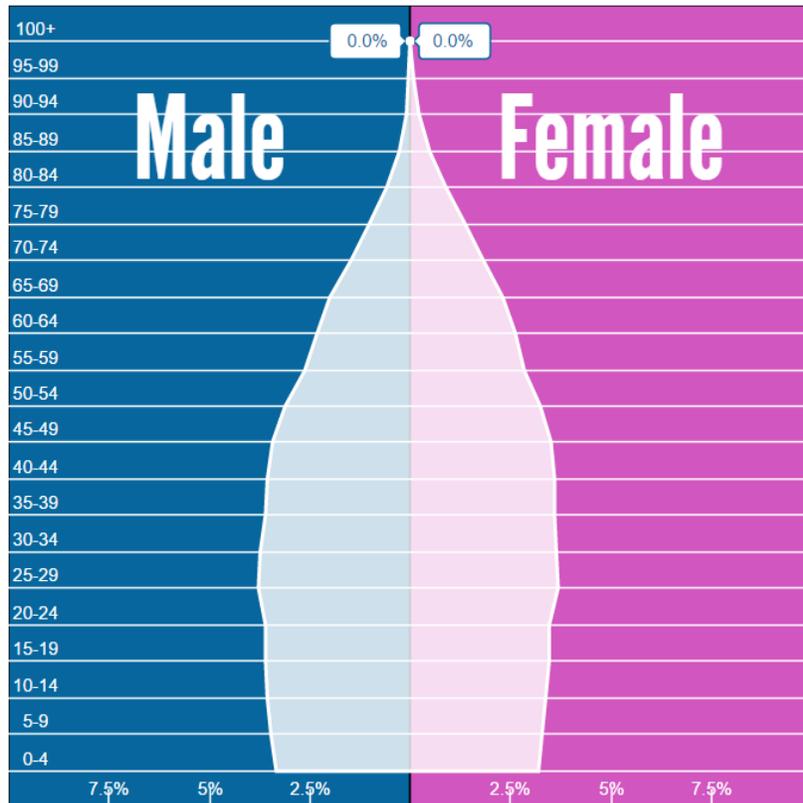


Data refer to 2009, except for Algeria and Tunisia, which are for 2004.

Investing in Global *Demographic Dividends*

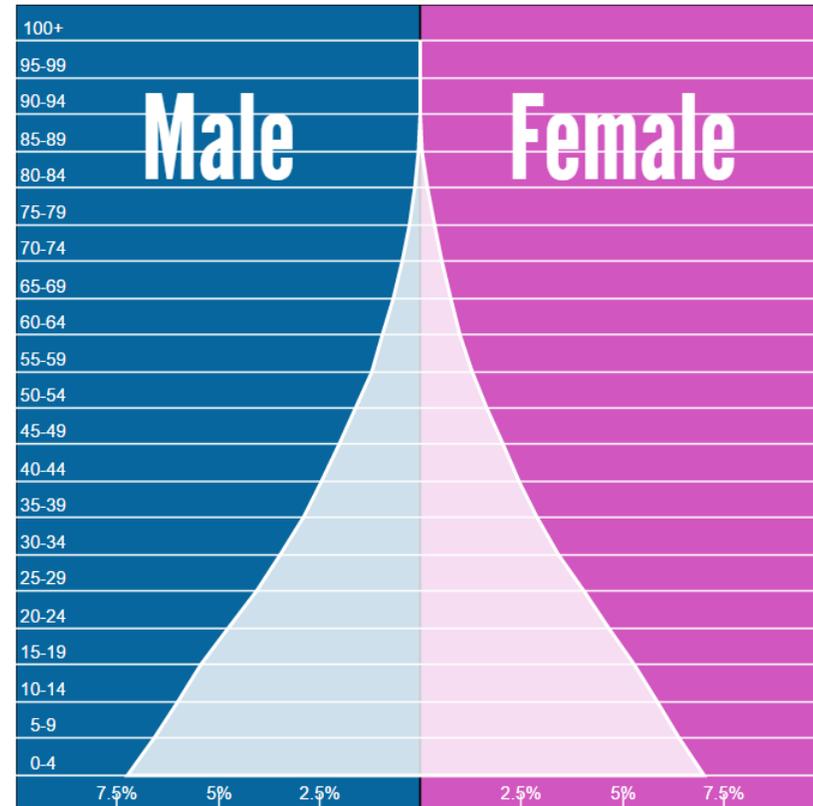
South America 2030

Population: **470.965.000**



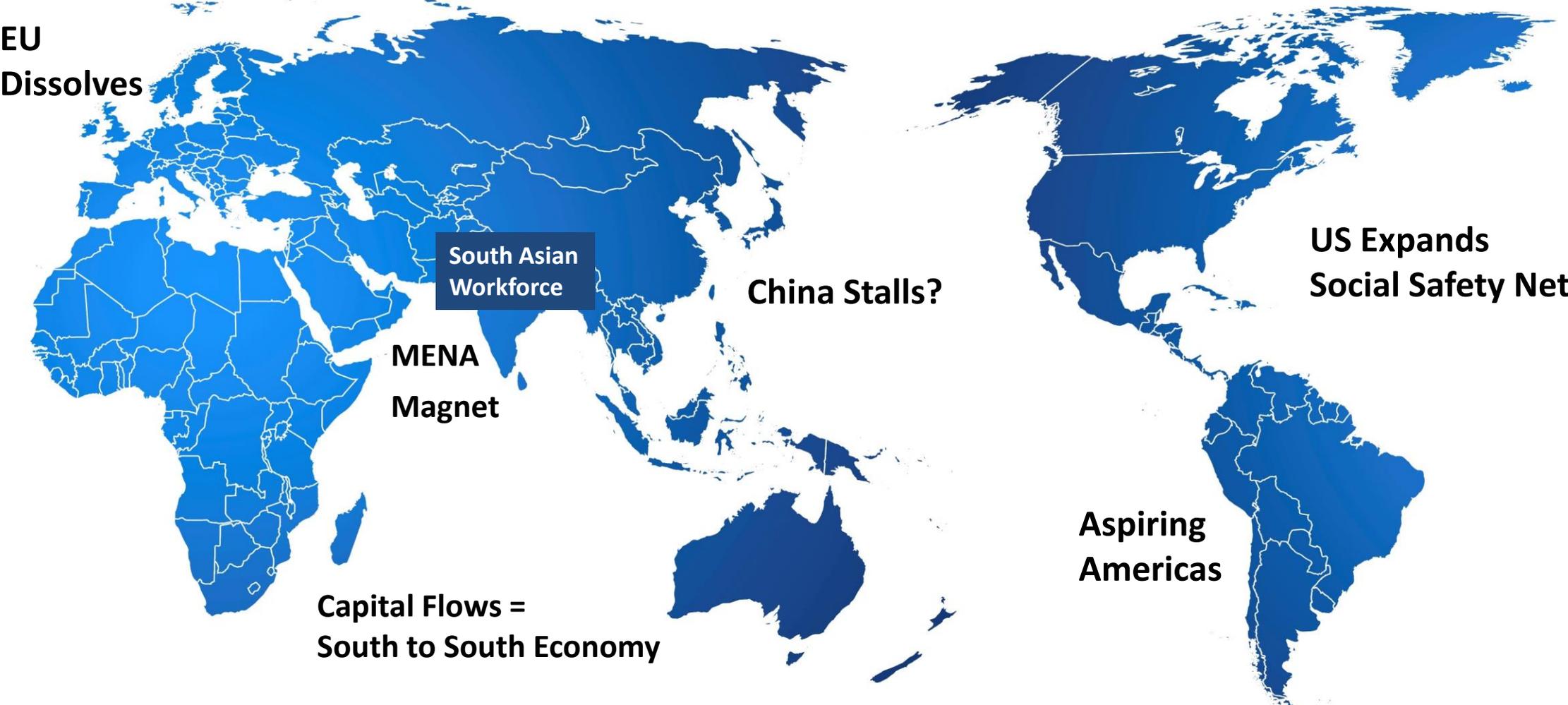
Sub-Saharan Africa 2030

Population: **1.396.853.000**



Consider Tipping Points Ahead for Global Events

Ageing 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

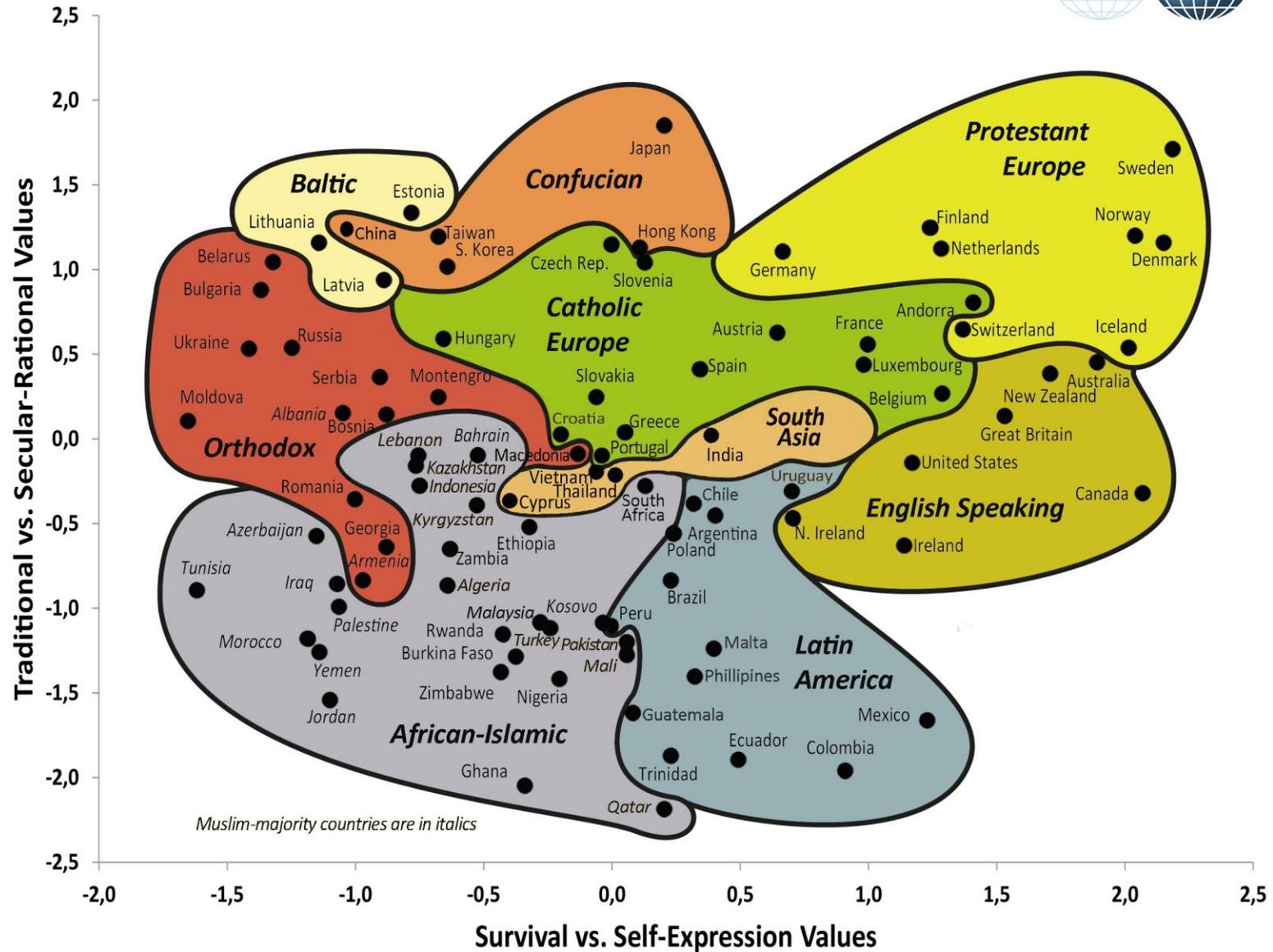
Spiral Dynamics Integral (SDi)

Bio-Psycho-Social Development Model

World Values Survey (University of Michigan)

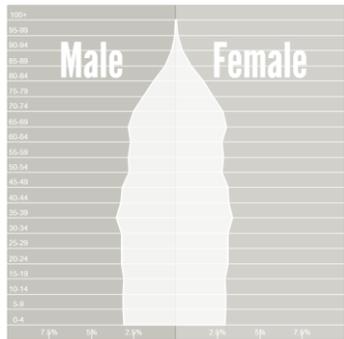


Demographic Meets Values Systems Inglehart–Welzel Cultural Map

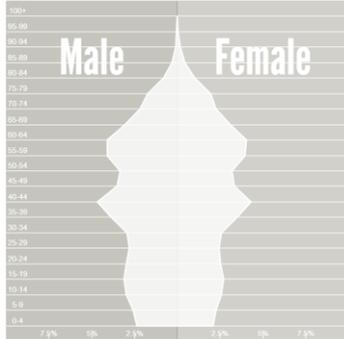


Global Drivers of Change 2017 – 2050

United States of America
2030 Population: 355.764.000



China
2030 Population: 1.415.545.000



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.

00100111...

True

False

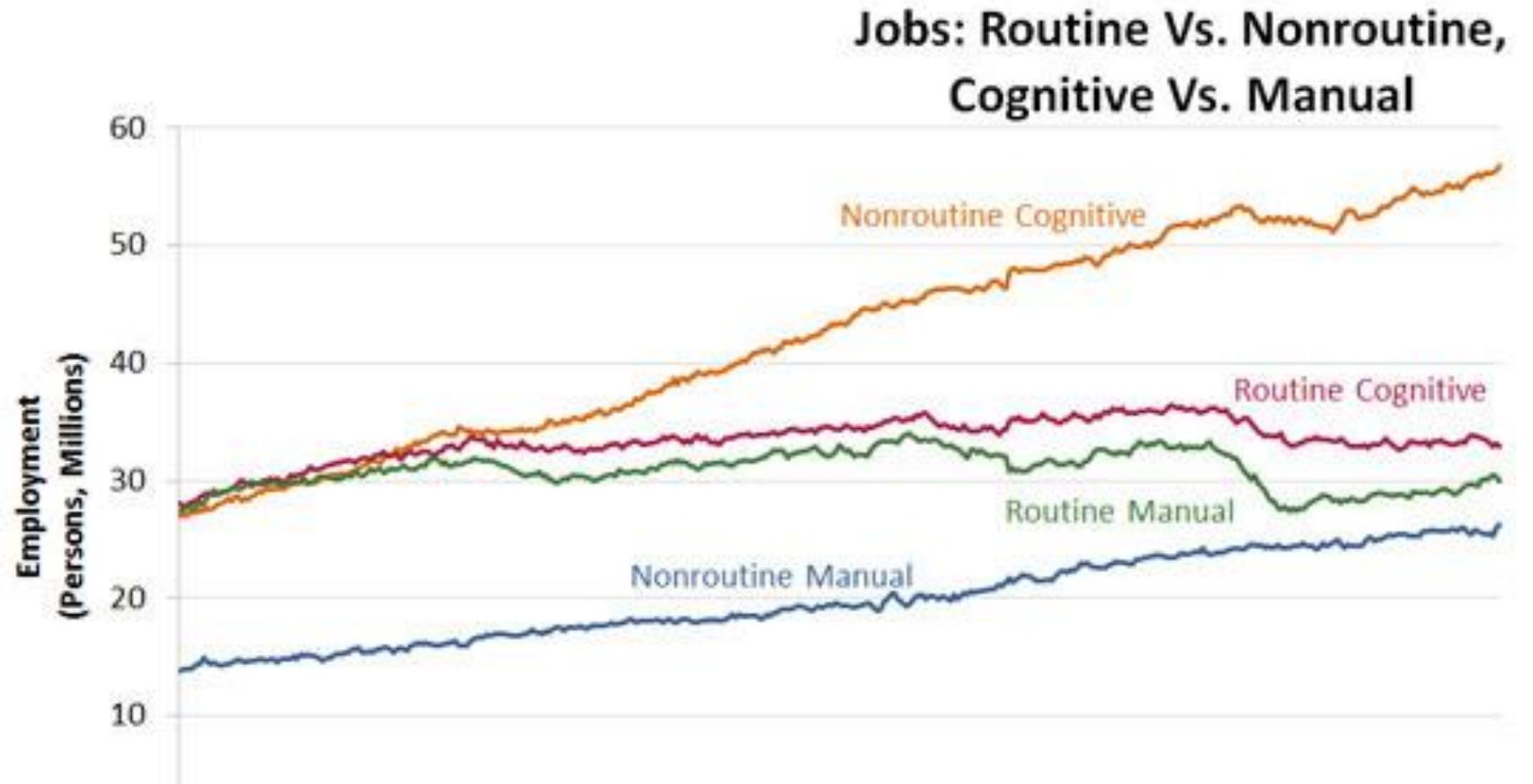
Deep Knowledge Venture's Appoints Intelligent Investment Analysis Software VITAL as Board Member

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



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 *Chatbots*

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

cogito SOLUTIONS PRODUCT COMPANY RESOURCES BLOG REQUEST A DEMO

Artificial intelligence powered by behavioral science

Grounded in proven scientific theory and validated through millions of real-world data points, Cogito's technology is helping create happier, healthier, more productive people.

ABOUT COGITO

Harness the power of voice

Cogito analyzes phone conversations and provides real-time guidance to help phone professionals better engage and connect with customers.

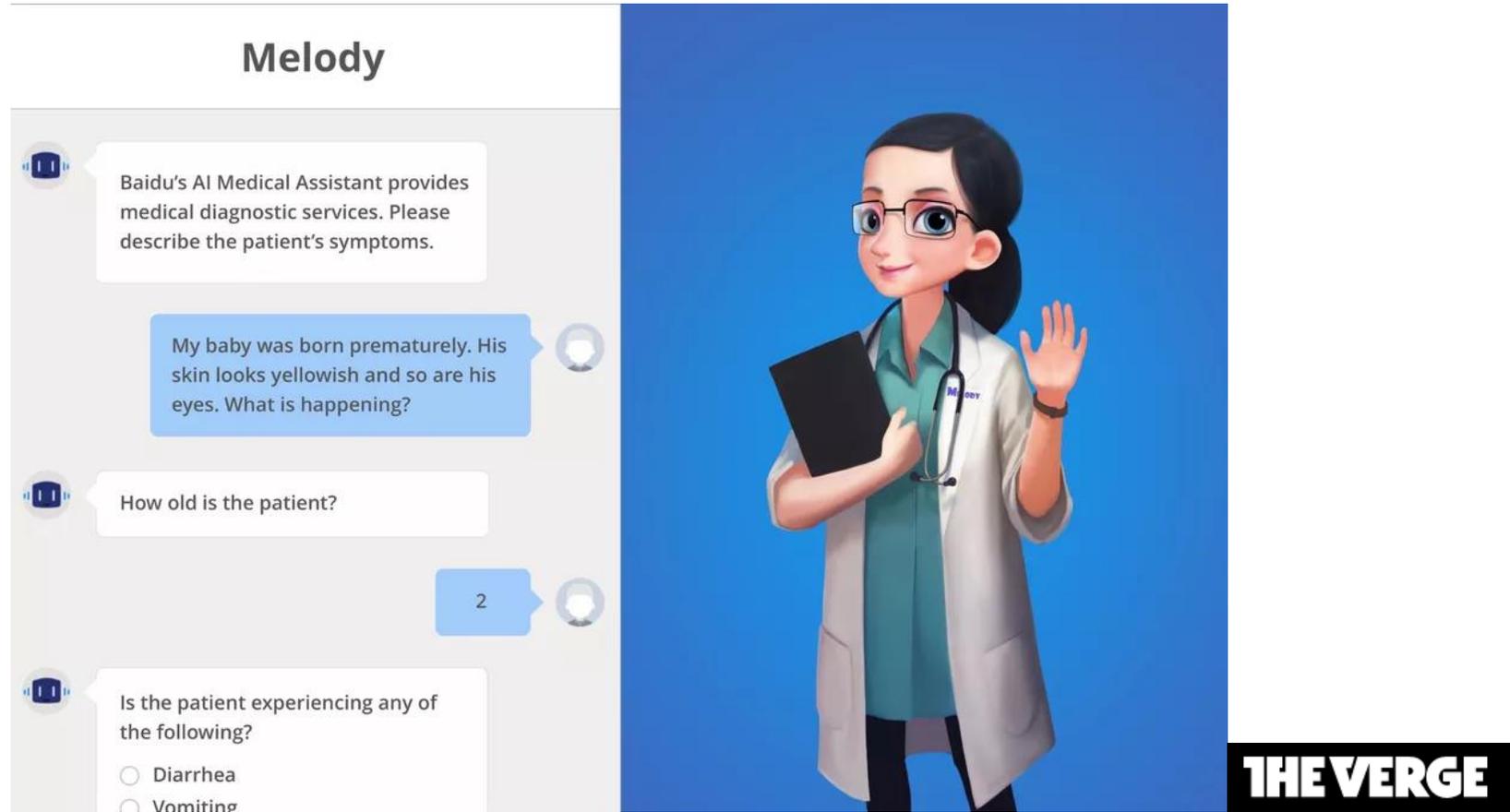
Socially Sensitive AI Software Coaches Call-Center Workers

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 image displays a screenshot of a chatbot interface on the left and a 3D illustration of a female doctor on the right. The chatbot interface is titled "Melody" and shows a conversation. The chatbot's initial message asks for symptoms. The user responds with a description of a premature baby's symptoms. The chatbot then asks for the patient's age, which is provided as "2". Finally, the chatbot asks if the patient is experiencing any of the following symptoms: Diarrhea and Vomiting.

Melody

Baidu's AI Medical Assistant provides medical diagnostic services. Please describe the patient's symptoms.

My baby was born prematurely. His skin looks yellowish and so are his eyes. What is happening?

How old is the patient?

2

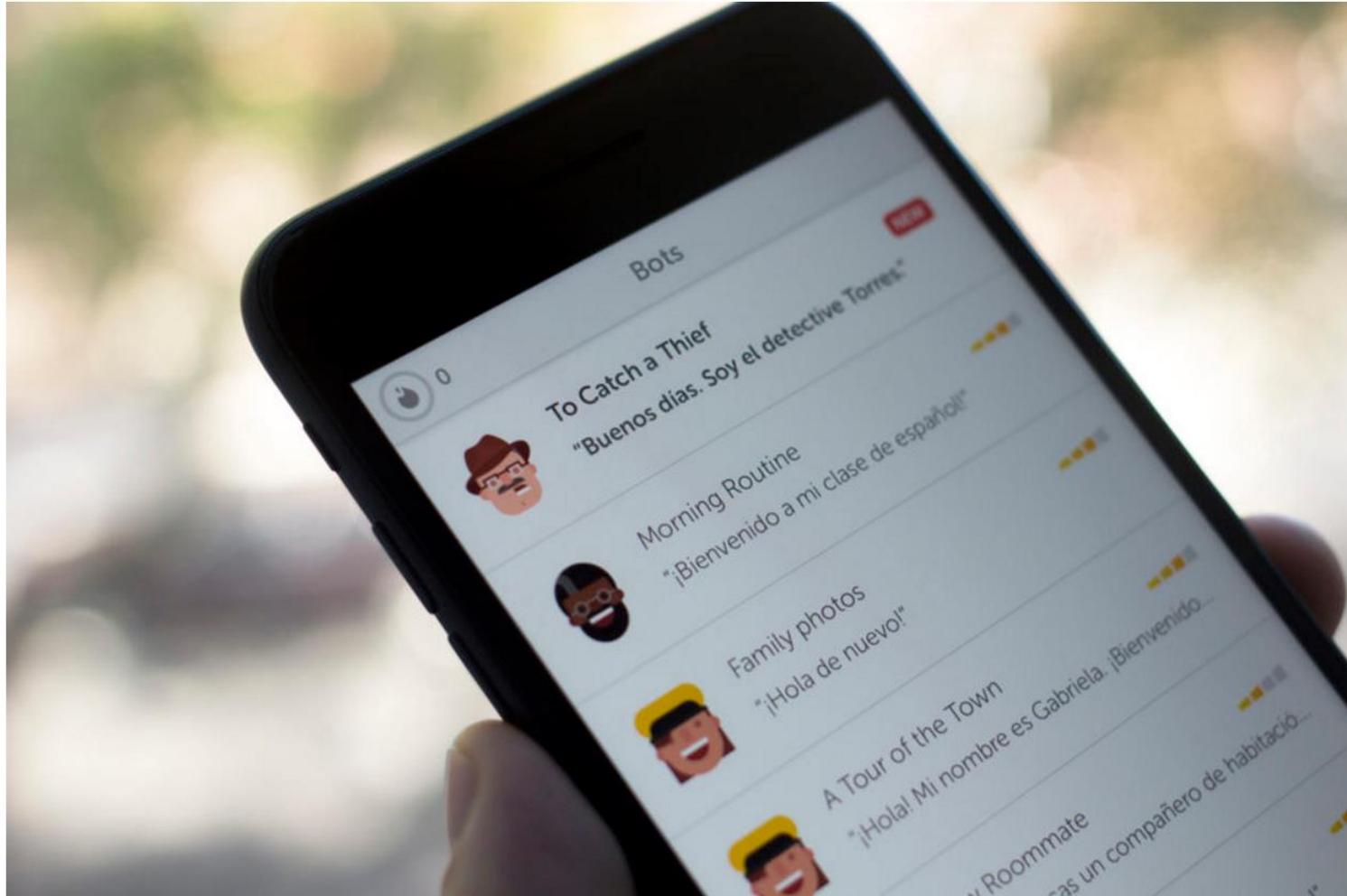
Is the patient experiencing any of the following?

- Diarrhea
- Vomiting

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

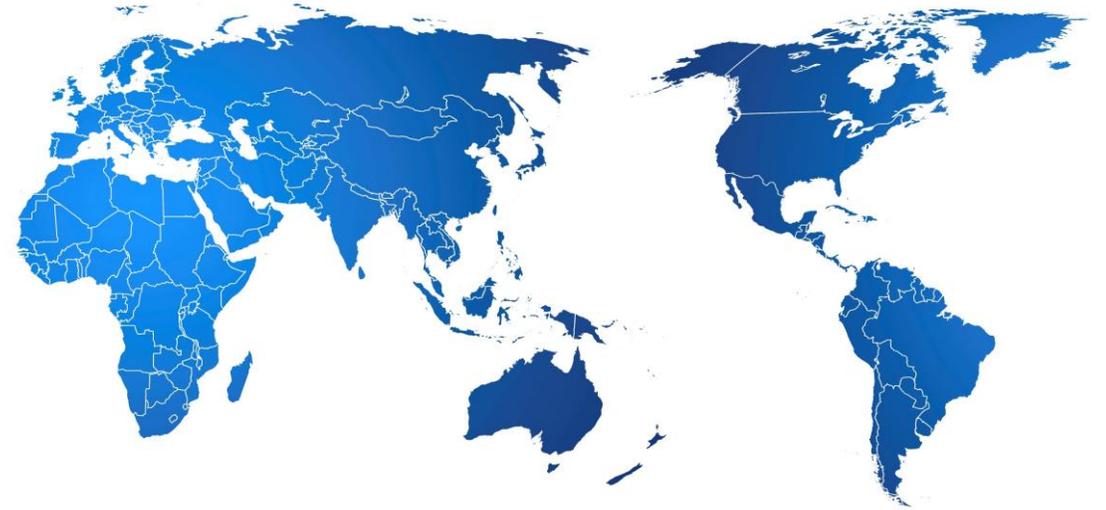
App designed by worker organization OUR Walmart is in the retail giant's crosshairs



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)



Healthcare

Helping doctors identify treatment options



Finance

Helping planners recommend better investments



Retail

Helping retailers transform customer relationships



Public Sector

Helping government help its citizens



Accelerated Research

Helping researchers find info faster



[Home](#)
[What is Watson?](#)
[Implement Watson](#)

[Build with Watson](#)
[The Watson Ecosystem](#)
[Mobile Developer Challenge](#)

[About Us](#)
[Our Headquarters](#)
[Our Team](#)
[Careers](#)
[Academic Partnerships](#)



[Email IBM](#)



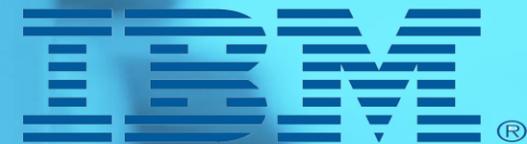
[Call 1-877-426-3774](#)
[Priority code: 109HF03W](#)



[Tweet us your questions](#)



[Like us](#)



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

ROSS

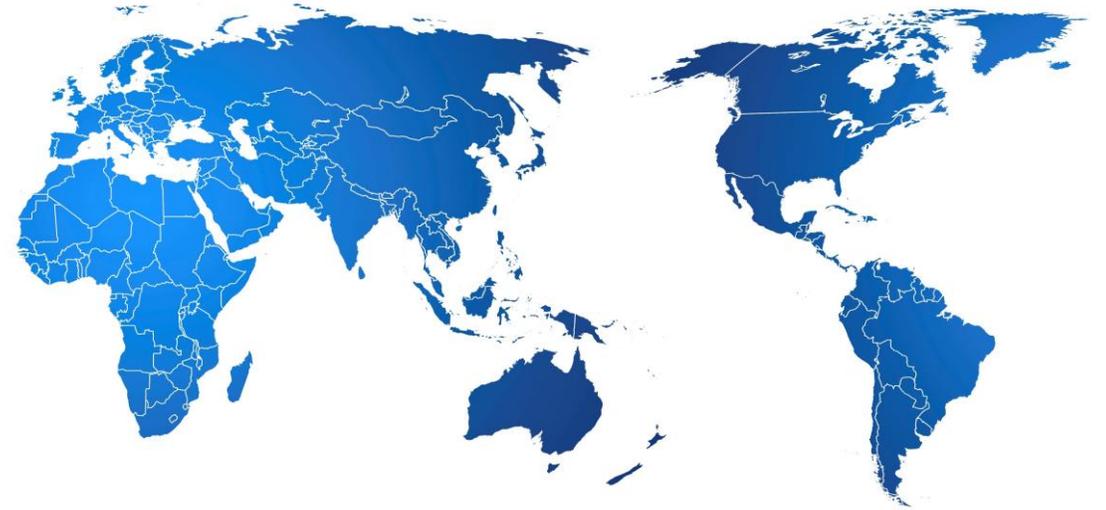
HOME ABOUT SIGNUP

Your brand new

SUPER INTELLIGENT ATTORNEY

LEARN MORE

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

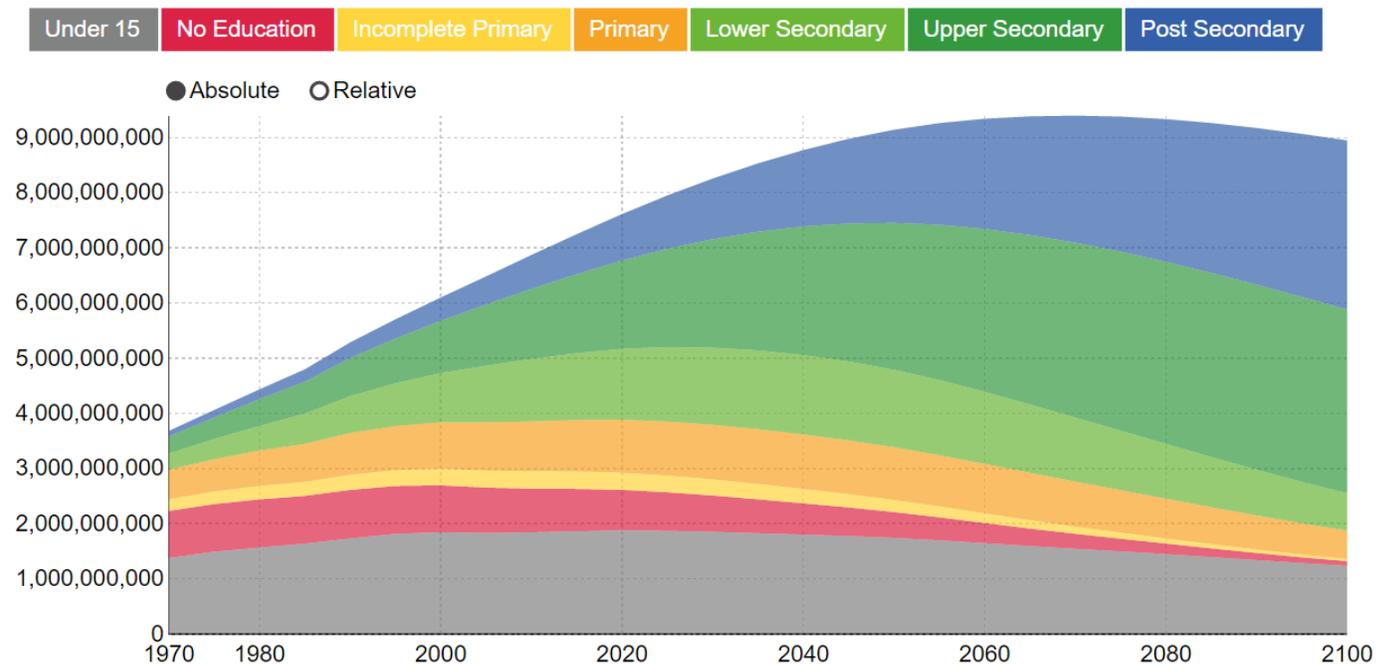


What if Intelligent Assistants could drive lifelong learning?

Projected world population by level of education, 1970 to 2100



This visualization shows the Medium projection by the International Institute for Applied Systems Analysis (IIASA). The researchers who created this projection describe it as their "middle of the road scenario that can also be seen as the most likely path".



Data source: IIASA (Global Projection – Medium SSP2)

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

Blockchain

+ Smart Contracts



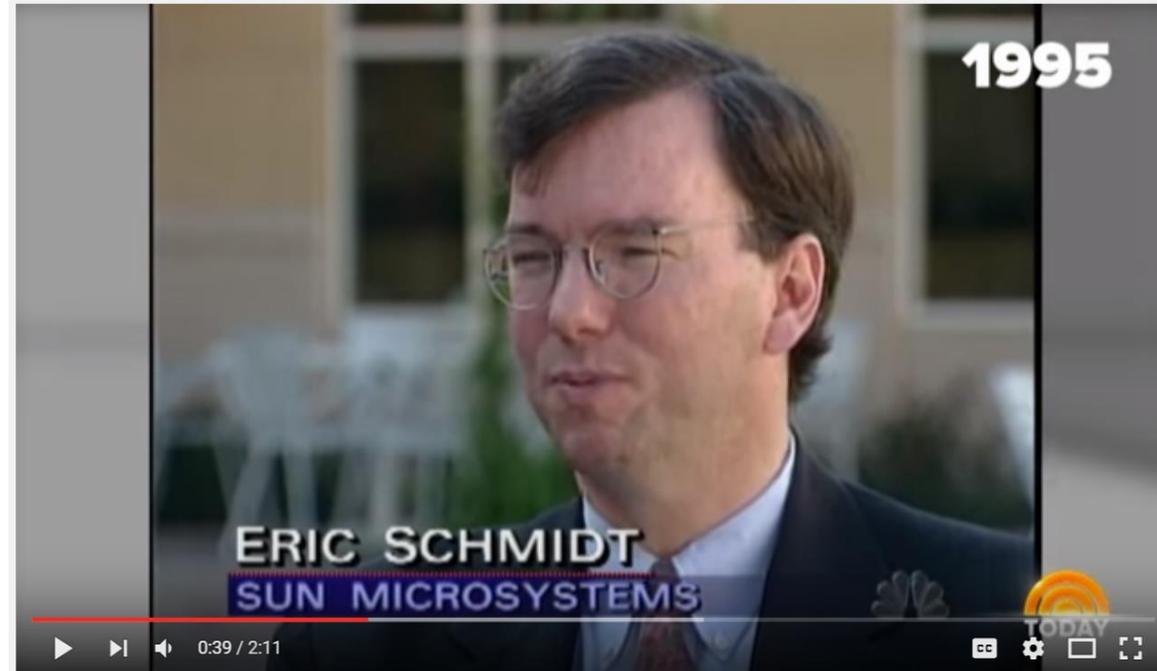
Remember, It Was Hard to Explain the Internet in 1994



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





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

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

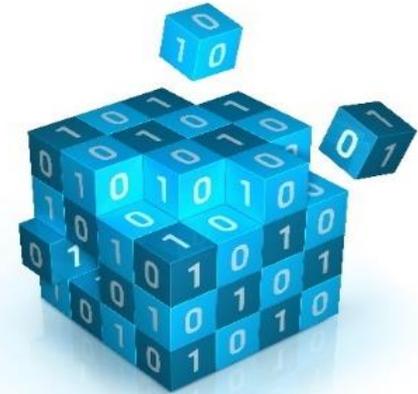
Evolution of the Web: Trust for Transactions



*Internet of Files
(Websites)*



*Internet of
Social Networks*



*Internet of
Transactions*

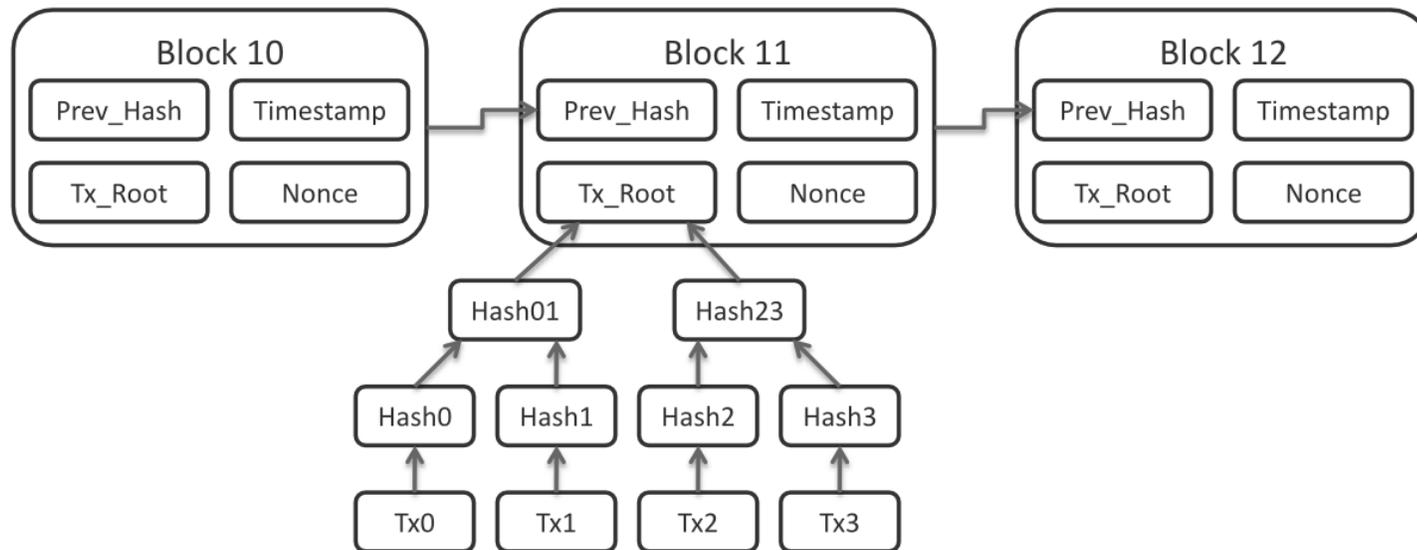
Low Cost + High Security

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

```
note: ***An Ethereum smart contract to sell website for "5000 by March"
note: First, store buyer's ethereum address:
put: 6af267736363738ghgs7726337373737 in storage slot BUYER
note: Then, store seller's ethereum address:
put: 6af267736363738ghgs7726337373737 in storage slot SELLER
note: April 1, 2014 is 13929839948 in "computer time"
put: 16365437465 in storage slot DEADLINE
note: If the agreed amount is received on time...
When: transaction value >= 50000 ether
and block timestamp <= storage slot DEADLINE
then
note: ... then designate the buyer as the new website admin and pay the seller
put storage slot BUYER in storage slot WEBSITE_ADMIN
Spend contract balance to storage slot SELLER
```

Application Development Ecosystems

Public Blockchains



HYPERLEDGER PROJECT

Fabric + Sawtooth Lake 

Private Blockchains



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.



iTunes without iTunes
Smart Contracts disperse payments



Uber without Uber
Distributed Ridesharing



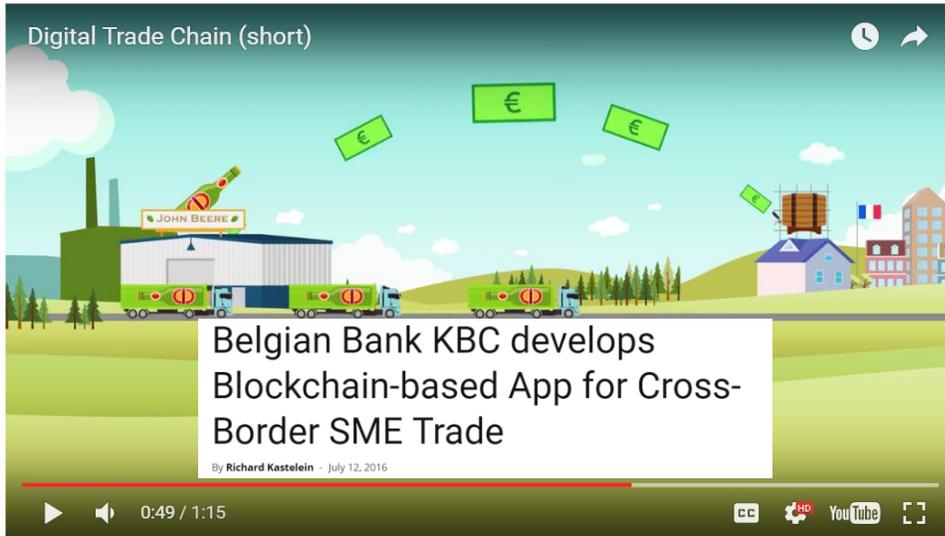
Peer to Peer Energy Trading



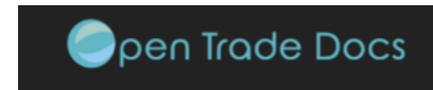
Could decentralized exchanges empower societies
or leave us unemployed?

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.



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



*Warm up
Foresight 101*



Drivers of Change



Discussion

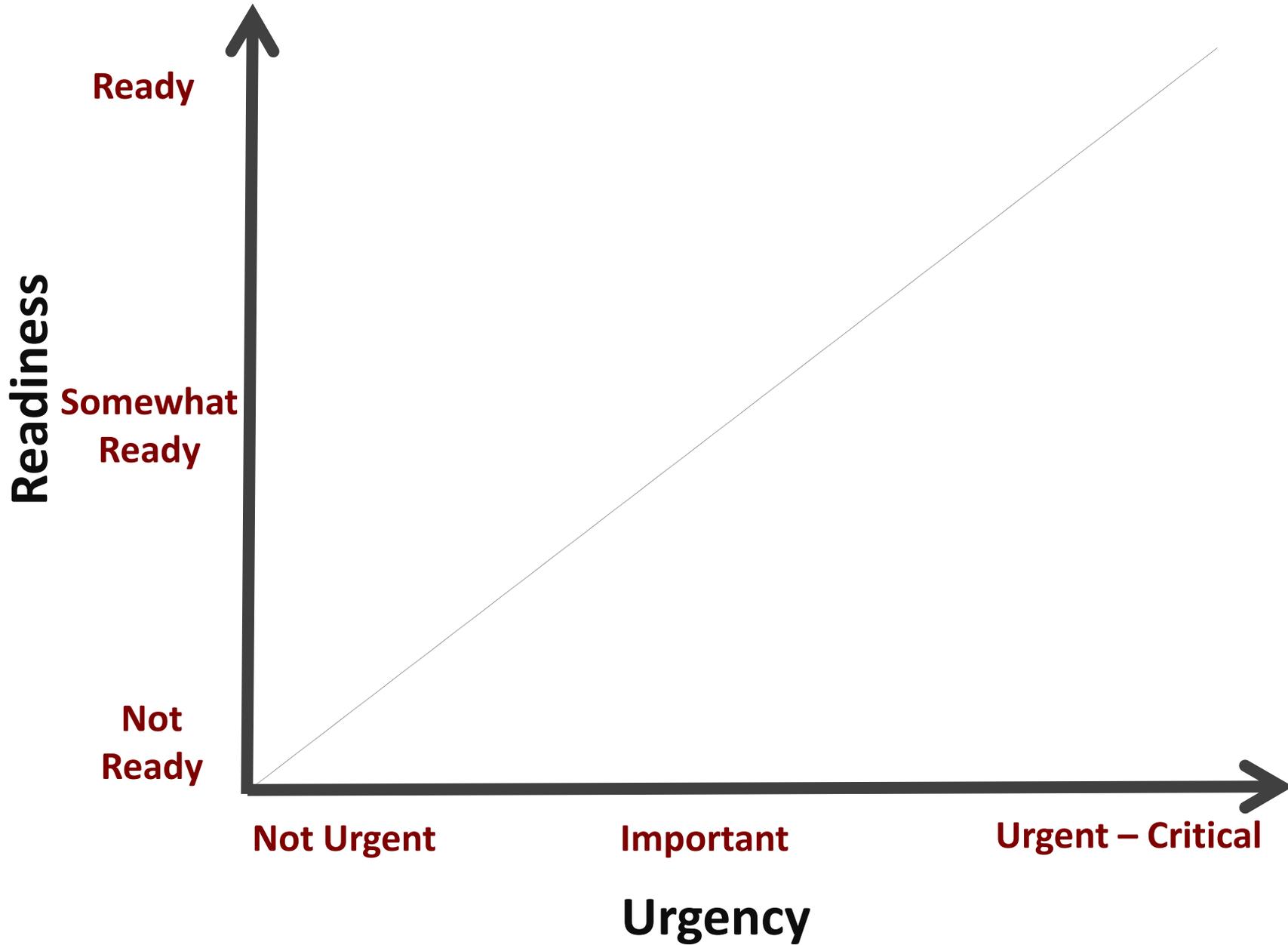




Garry Golden
garrygolden.com/Feb15



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***

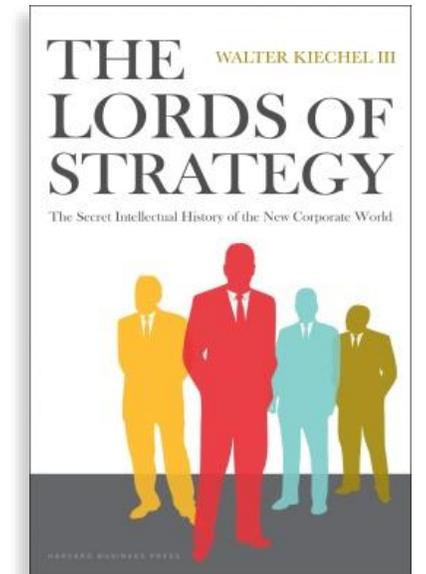
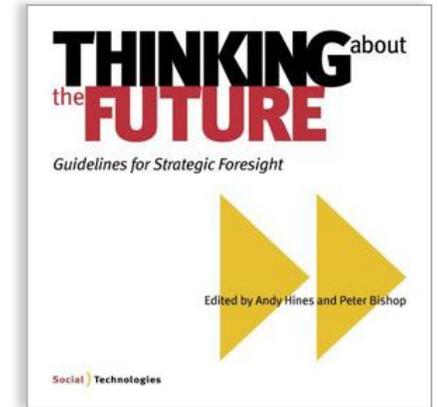
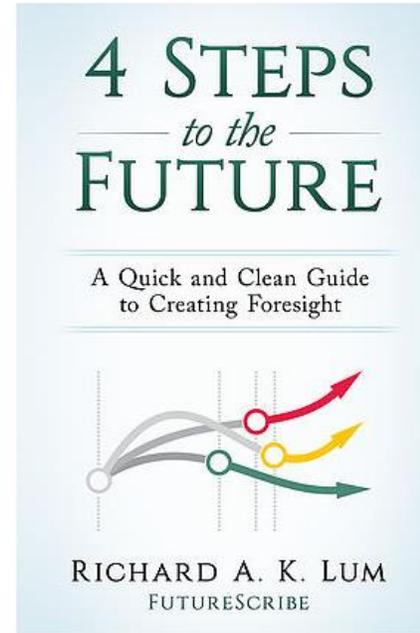
By Richard (Kaipo) Lum

- ❑ ***The Lords of Strategy***

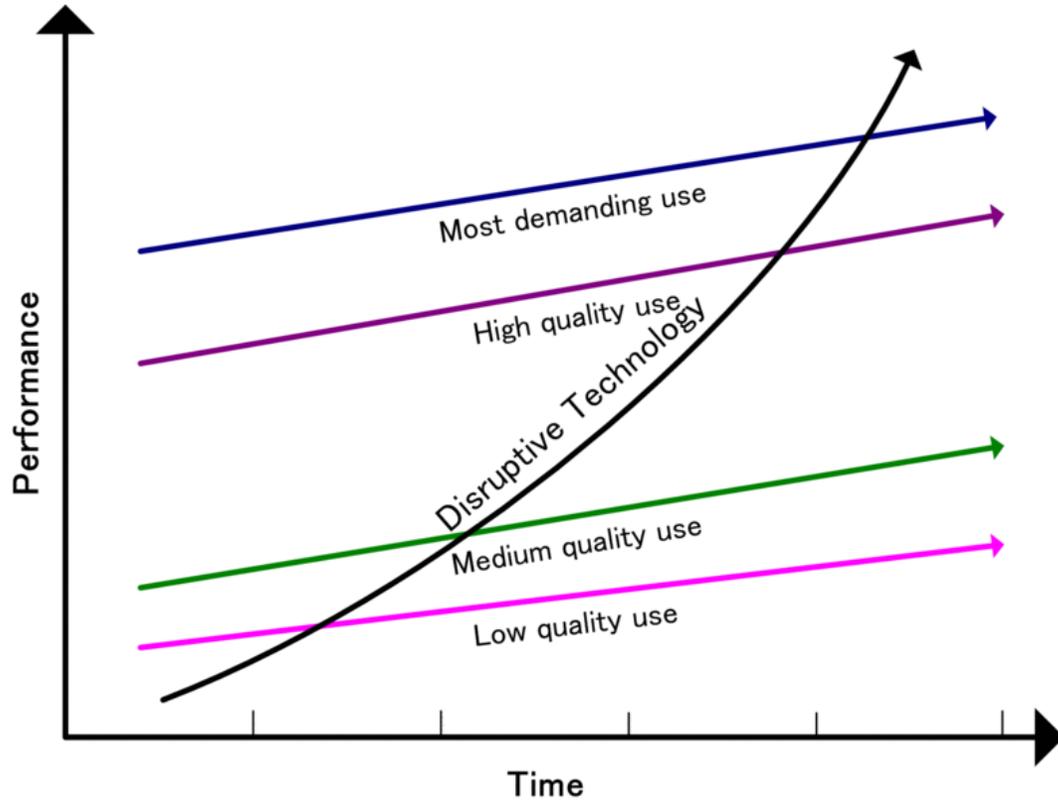
By Walter Kiechel

Executive Level Foresight Training

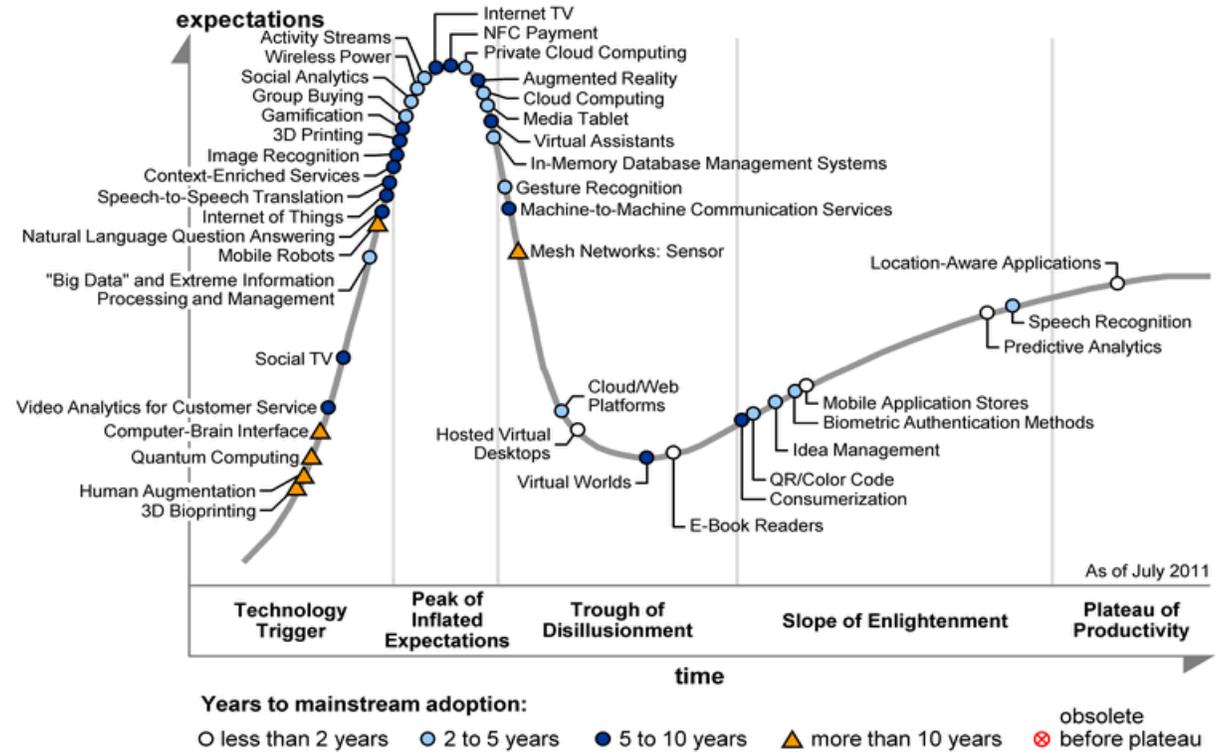
- ❑ *University of Houston Studies of Future Program*
- ❑ *Foresight Education and Research Network (FERN)*



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...”

Watershed LRS

WaxLRS
by SaLTBOX

Yet Analytics

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