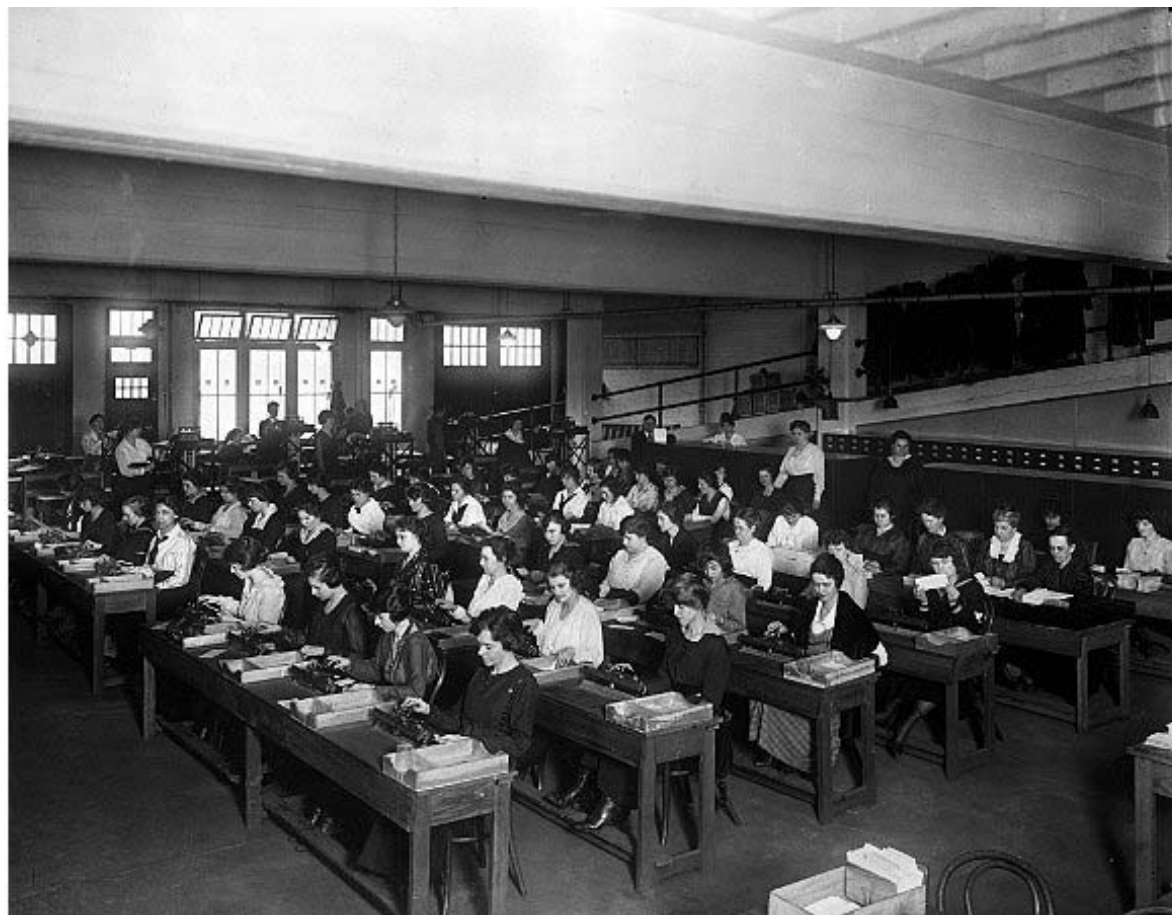# MIS 3534 Fall 2015 – Strategic Management of Information Technology
Week 13 – IT and Your Career

Min-Seok Pang

Management Information Systems
Fox School of Business, Temple University
minspang@temple.edu
Dec. 7th, 2015

Fox School of Business
TEMPLE UNIVERSITY

Women Mathematicians at World War II

who were called "Computers."

Today's Question

● How to *survive* in the job market and *thrive* in your career by *winning* the battle against the machine?
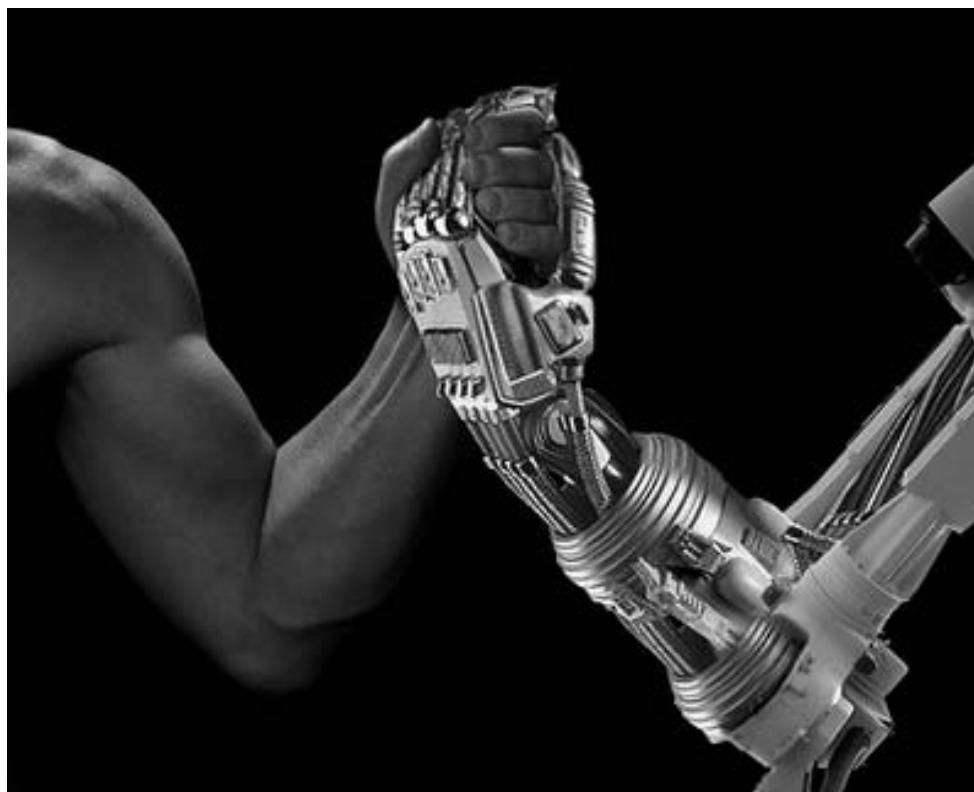
A Good but Not-So-Good News – Jobless Recovery

The New York Times

September 5, 2009

In Unemployment Report, Signs of a Jobless Recovery

THE WALL STREET JOURNAL.

BUSINESS | January 17, 2012

Man vs. Machine, a Jobless Recovery

U.S. Companies Are Spending to Upgrade Factories but Hiring Lags; Robots Pump Out Sunny Delight

Bloomberg Businessweek

AROUND THE STREET   November 6, 2009, 10:19AM EST

October Data Point the Way to a 'Jobless Recovery'

The Economist
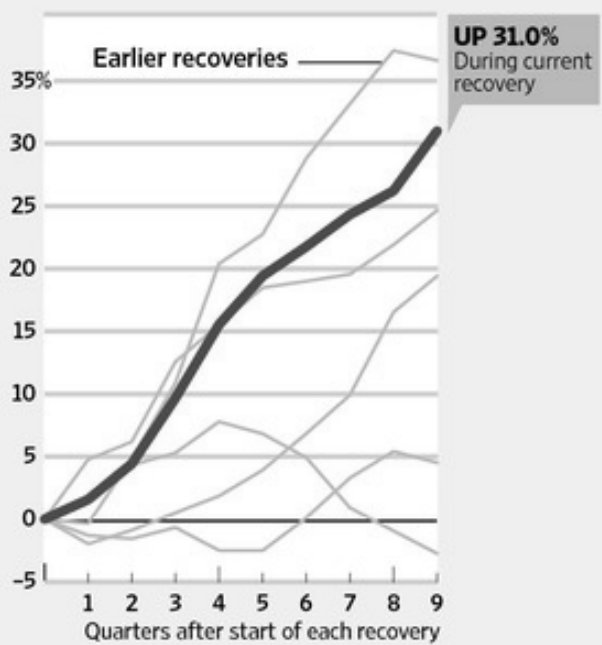
American unemployment

Forgotten men

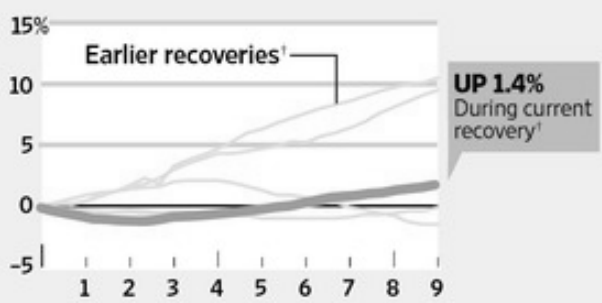The jobless recovery, long prophesied, is here

Spending Spree | Businesses splurge on machines, not muscle

Change since each recovery began in ■ spending by business on equipment, software; adjusted for inflation* ■ the number of private-industry jobs
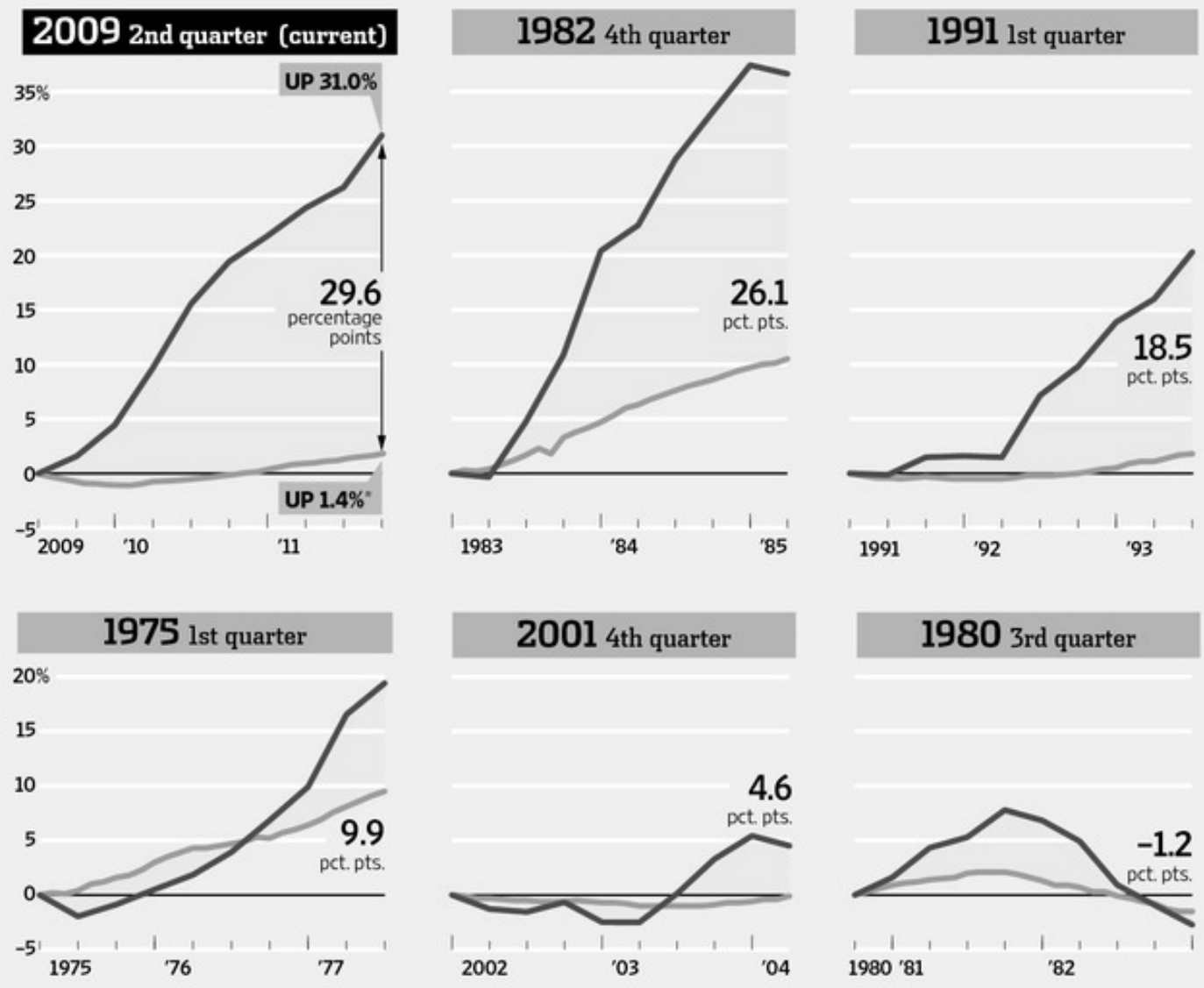
In the current recovery, **business spending on equipment and software** has rebounded faster than usual...

UP 31.0% During current recovery

Earlier recoveries

35%
30
25
20
15
10
5
0
-5

1 2 3 4 5 6 7 8 9
Quarters after start of each recovery

...while **private-industry jobs** have been relatively slow to return...

Earlier recoveries†

UP 1.4% During current recovery†

15%
10
5
0
-5

1 2 3 4 5 6 7 8 9

The **difference** between the speed of the rebound in business investment in equipment and software and that in private-industry hiring is **the widest in decades**, as a result.

2009 2nd quarter (current)

UP 31.0%
29.6 percentage points
UP 1.4%*

35%
30
25
20
15
10
5
0
-5

2009   '10   '11

1982 4th quarter

26.1 pct. pts.

1983   '84   '85

1991 1st quarter

18.5 pct. pts.

1991   '92   '93

1975 1st quarter

9.9 pct. pts.

20%
15
10
5
0
-5

1975   '76   '77

2001 4th quarter

4.6 pct. pts.

2002   '03   '04

1980 3rd quarter

−1.2 pct. pts.

1980 '81   '82

†The 1991 recovery was so similar to the current one that the lines overlap.

*Through September because latest figure available for nonresidential fixed investment in equipment and software is for the third quarter of 2011. As of December, the number of private-industry jobs had risen 1.8% from the June 2009 level

Note: Start date for each chart is the first full quarter of each recovery as defined by National Bureau of Economic Research.

Sources: Commerce Department; Labor Department

Pat Minczeski/The Wall Street Journal

http://online.wsj.com/article/SB10001424052970204468004577164710231081398.html

What does this mean and *Why?*

More Bang for the Buck

The value of goods and services produced for every hour worked has grown sharply in the nonfarm business sector during this recovery—while the total number of hours worked is up only a bit. The upshot: The ratio of compensation to productivity, or unit labor costs, has been falling.

Change since the recovery's start in:

| Output per hour | Output | Hours | Unit labor costs |
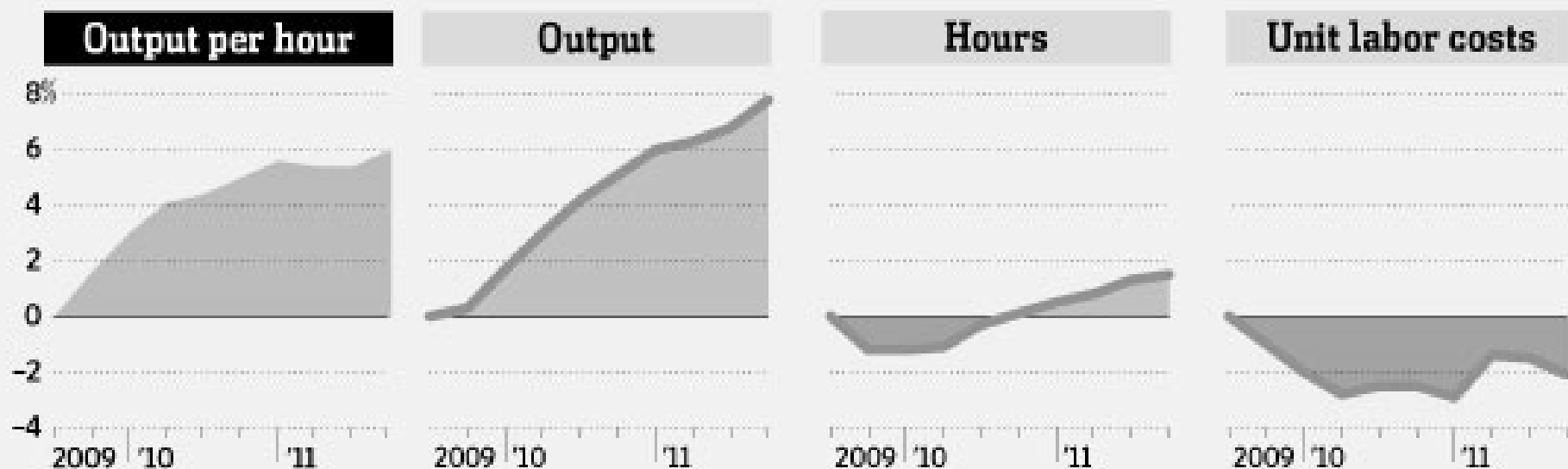
Source: Labor Department

Pat Minczeski/The Wall Street Journal

http://online.wsj.com/article/SB10001424052970204468004577164710231081398.html

Why Jobless Recovery? – Automation (1/2)

Pennsylvania Turnpike to test out cashless interchanges next year

E-ZPass and license plate-scanner program will be rolled out at Beaver Valley Expressway and Delaware River Bridge

UPDATED   11:51 AM EDT Sep 28, 2015

Text Size: A **A** A

Toll Plaza
2000 FEET
/ Pay Toll

http://www.washingtonpost.com/blogs/dr-gridlock/wp/2012/10/31/beltway-express-lanes-to-open-before-thanksgiving-operators-say/
http://stormhighway.com/blog/july2109a.shtml
http://www.wtae.com/news/pennsylvania-turnpike-to-test-ez-pass-cashless-interchange-at-beaver-valley/35527534

Why Jobless Recovery? – Automation (2/2)

> ***What if every item in a grocery store has an EZPass (an RFID chip)?***

Why Jobless Recovery? – Outsourcing

The Man Who Makes Your iPhone

Foxconn founder Terry Gou might be regarded as Henry Ford reincarnated if only a dozen of his workers hadn't killed themselves this year. An exclusive look inside a postmodern industrial empire
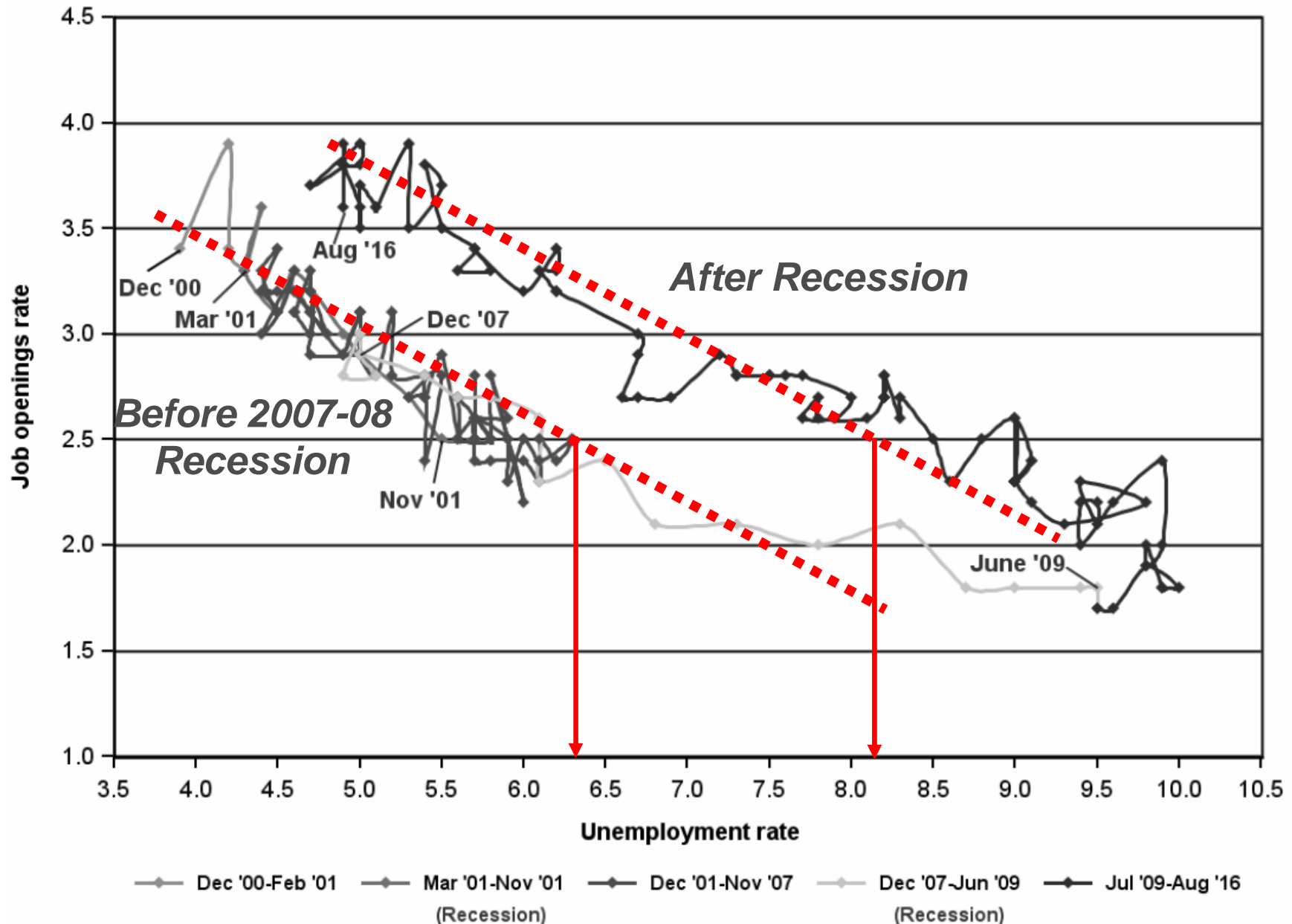
Bloomberg Businessweek

2 of 19 ◀ ▶

Inside the iPhone Maker

PHOTOGRAPH BY TONY LAW FOR BLOOMBERG BUSINESSWEEK

http://www.businessweek.com/magazine/content/10_38/b4195058423479.htm
http://images.businessweek.com/ss/10/09/0909_foxconn/2.htm

Why Jobless Recovery? – Skill Mismatch (1/3)

Chart 4. The Beveridge Curve (job openings rate vs. unemployment rate) Seasonally adjusted
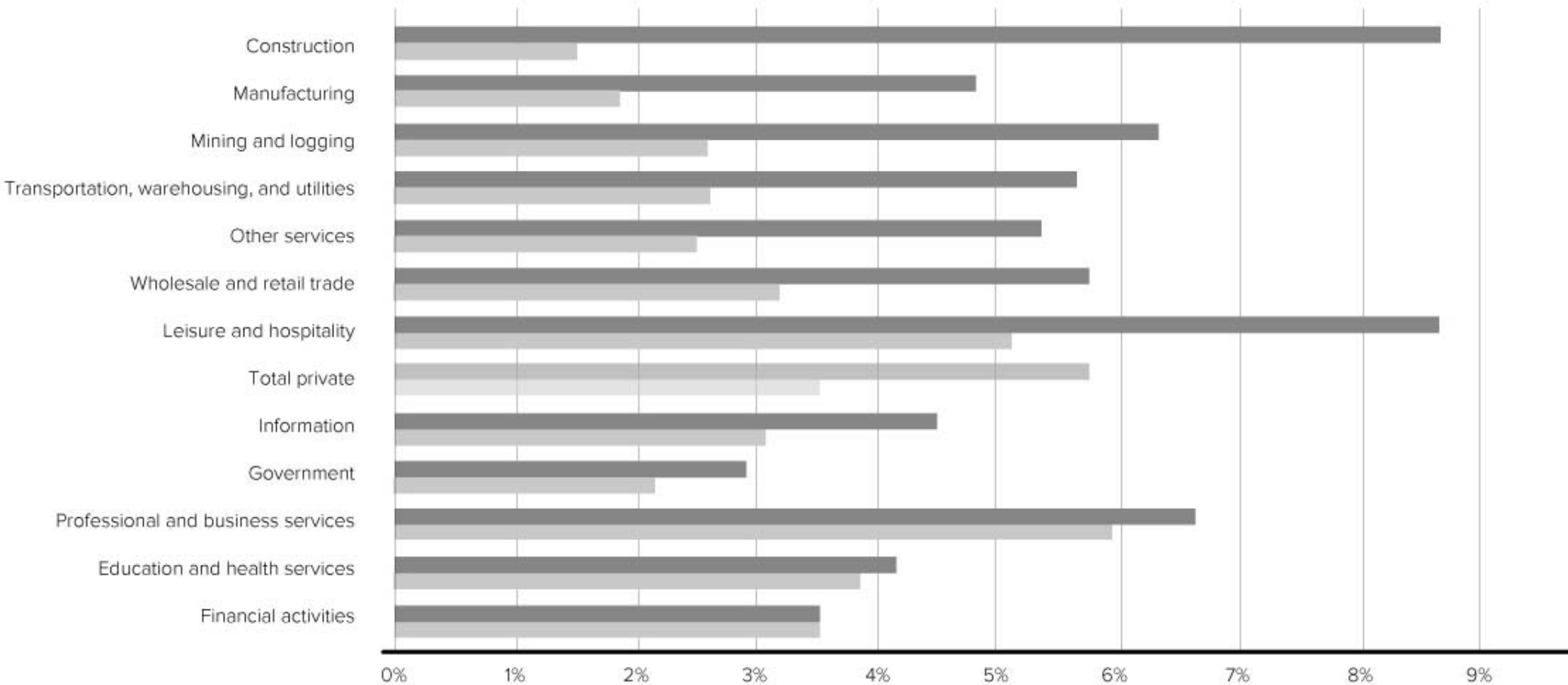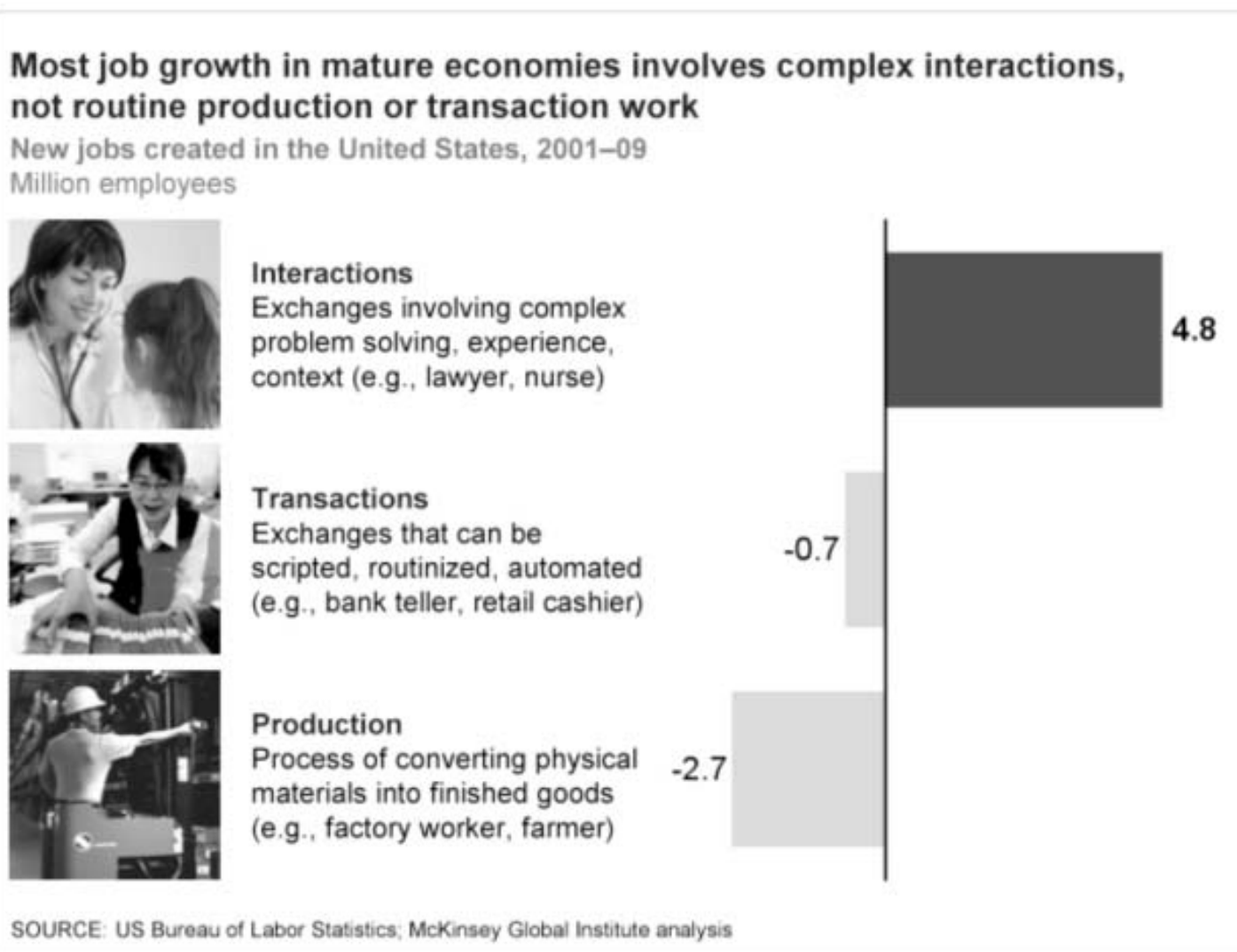
Why Jobless Recovery? – Skill Mismatch (2/3)

JOB OPENINGS RATE AND UNEMPLOYMENT RATE, BY INDUSTRY
Percentage of the labor force, three-month-averages, Aug-Oct 2014

https://tcfdotorg.atavist.com/where-are-the-jobsnbsjq

Why Jobless Recovery? – Skill Mismatch (3/3)

Most job growth in mature economies involves complex interactions, not routine production or transaction work

New jobs created in the United States, 2001–09
Million employees

Interactions
Exchanges involving complex problem solving, experience, context (e.g., lawyer, nurse)

4.8

Transactions
Exchanges that can be scripted, routinized, automated (e.g., bank teller, retail cashier)

-0.7

Production
Process of converting physical materials into finished goods (e.g., factory worker, farmer)

-2.7

SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis

http://www.foreignpolicy.com/articles/2012/03/16/help_wanted?page=full

Race Against the Machine

© Original Artist
Reproduction rights obtainable from
www.CartoonStock.com

search ID: cwln2663

WILOT
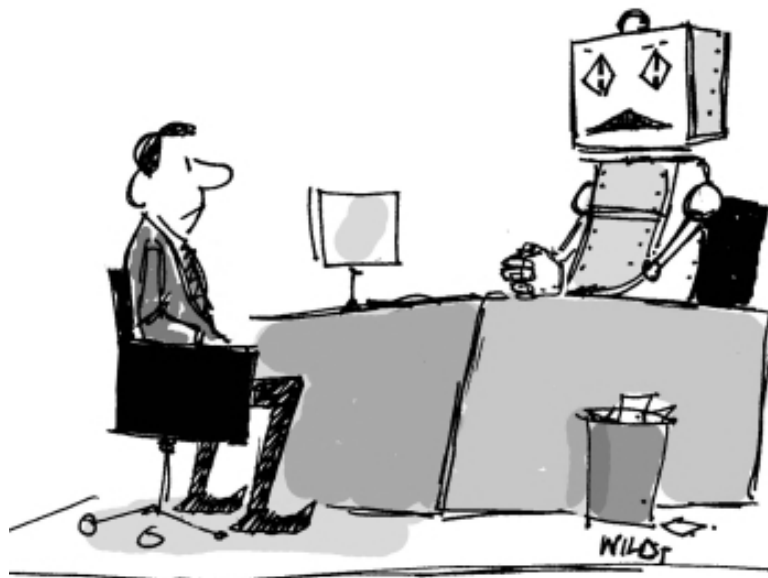
"You're hired, but remember, you can be replaced by a machine...believe me."

Erik Brynjolfsson
Andrew McAfee

Race Against The Machine

How the Digital Revolution is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy

http://www.cartoonstock.com/directory/o/outsourcing.asp

Wall Street Bankers vs. the Machines

BloombergBusinessweek
Markets & Finance

Wall Street banks are replacing people with computers to trade financial instruments that once generated some of their biggest profits. Late last month, UBS (UBS), Switzerland's biggest bank, fired its head of credit-default swap index trading, David Gallers, and replaced him with computer algorithms that trade using mathematical models, according to two people familiar with the matter

Photo illustration by 731; Trading floor: Jin Lee/Bloomberg; Monitors: Oleksiy Maksymenko/Alamy

Swaps

Computers Elbow Swaps Traders Aside

http://www.businessweek.com/articles/2012-11-15/computers-elbow-swaps-traders-aside

Accountants vs. the Machines

Journalists vs. the Machines

http://www.dailydot.com/technology/robot-journalism-automated-insights-algorithm/

Lawyers vs. the Machines

DIFFERENT SCALES

Salaries at Mumbai law firms are higher than those at Delhi firms.

Annual salary (₹)

■ Mumbai ■ Delhi

After six years at a top-paying corporate law firm, lawyers can expect a base package of up to **₹30 lakh** per year, although some at smaller law firms in Delhi can still be on less than **₹10 lakh** per year in the same period (see graph). Throughout an associate's career bonuses generally vary between **10%** of the base salary to up to **30%**.

Source: Author's research

http://www.nytimes.com/2010/08/05/business/global/05legal.html?_r=0
http://www.legallyindia.com/201111252419/Analysis/

Pilots vs. the Machines

Ryanair's O'Leary Calls for Single-Pilot Commercial Flights

AIN AIR TRANSPORT PERSPECTIVE » SEPTEMBER 10, 2010

by **CHARLES ALCOCK**

Where did he go?

al chief executive Michael
...inate copilots in his Boeing
...indicated that he will start
...ound 300 new aircraft but
...whether Airbus ...enters the competition for the
fleet renewal remains a matter of speculation.
(Photo: Matt Banks)

September 10, 2010, 7:26 AM

Ryanair chief executive Michael O'Leary is pushing for single-pilot commercial aircraft operations. In a September 8 interview with the Financial Times, O'Leary argued that copilots are essentially redundant in modern airliners because "the computer does most of the flying." The Ireland-based low-cost carrier subsequently confirmed that it initiated a dialogue with aviation authorities regarding the possibility of legalizing single-pilot operations, but in a statement made clear that the proposal remains at an early stage. "No formal approach has been made, but we are starting the debate so that we can look to reduce costs without compromising safety," Ryanair said in the statement. "Given the sophistication of our aircraft we believe that one pilot flying can operate safely on short routes and reduce fares for all passengers."
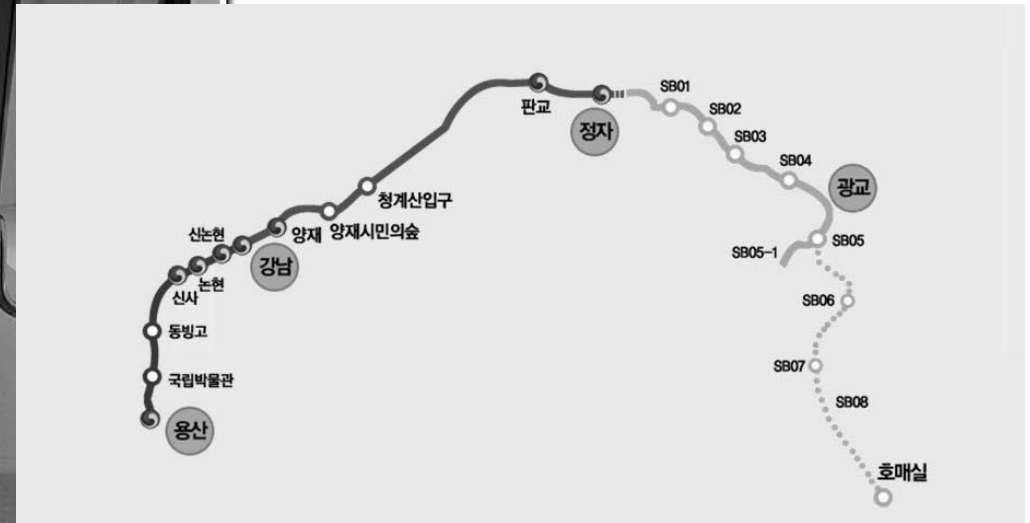
http://www.airfield-ghent.be/documents1/index.html
http://www.ainonline.com/aviation-news/ain-air-transport-perspective/2010-09-10/ryanairs-oleary-calls-single-pilot-commercial-flights

Drivers vs. the Machines

http://bits.blogs.nytimes.com/2014/05/13/a-trip-in-a-self-driving-car-now-seems-routine/
http://wot.motortrend.com/1505_google_self_driving_cars_begin_tests_on_city_roads_this_summer.html

Subway Conductors vs. the Machines
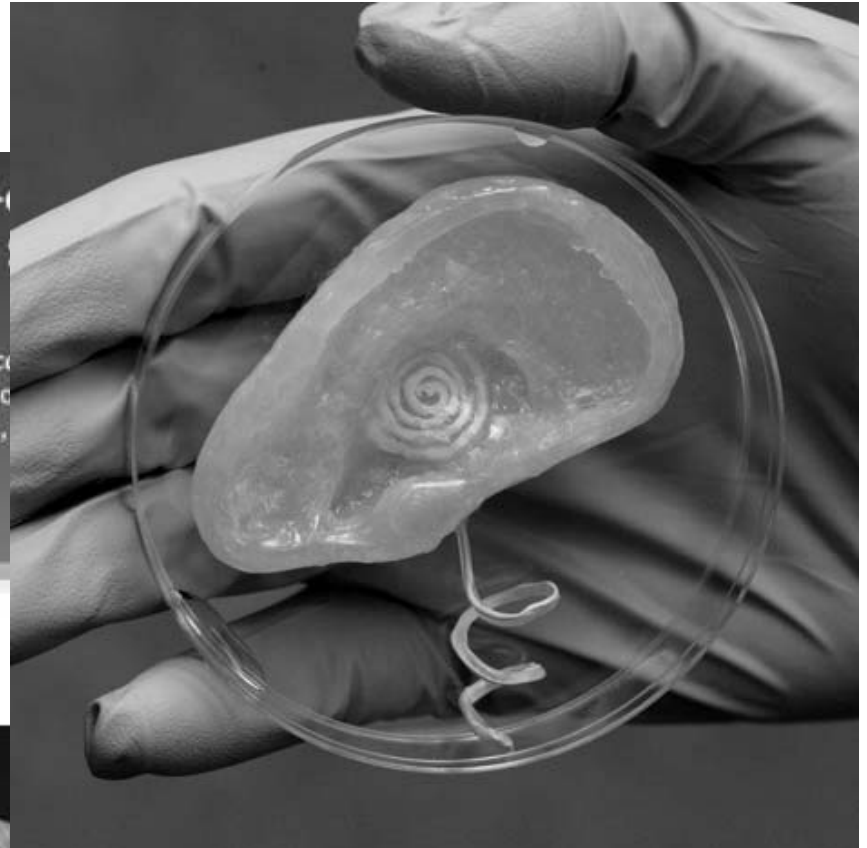

● A new 10.7-mile subway line with no conductor

Restaurant Servers vs. the Machines

http://sf.eater.com/2015/9/2/9252149/eatsa-the-early-word-san-francisco

3D Printer vs. who?

Breakthrough low-
3D printing...Only
right at your desktop!

Desktop Factory will make *low-c*
high-performance three-dimensi
printing pervasive in *businesses*,
schools and *homes*.

Learn More

Whose job is in danger if every household has one of these?

How long do you want to live?

● How long do you think you'll live?

● Then, when do you have to retire if you want to live up to 100 years?

● What kind of technology breakthroughs will take place *for the next 50 years*?

http://physics.illinois.edu/history/timelines/1960s.asp
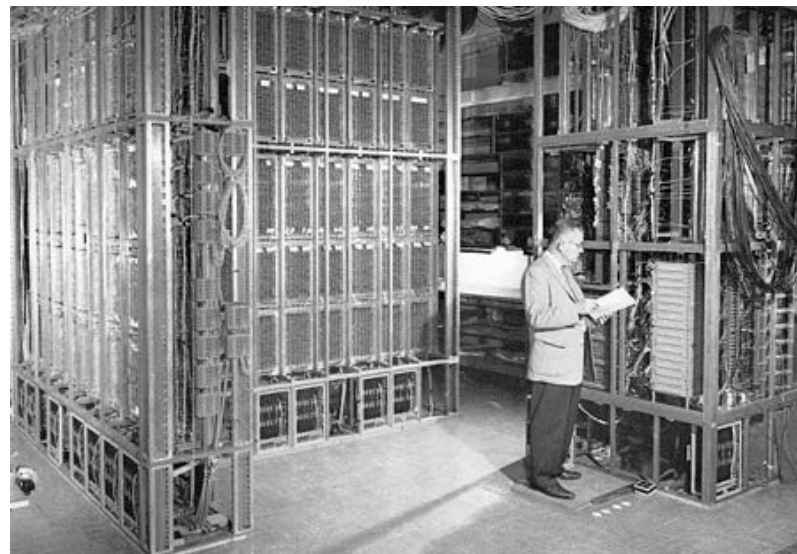
Let's face it.

● Automation and outsourcing are <u>irreversible</u> trends.

● No occupation is immune to this trend.

● New technologies will continue to emerge for our lifetime and *fundamentally transform* the society and the job market (probably faster and faster).

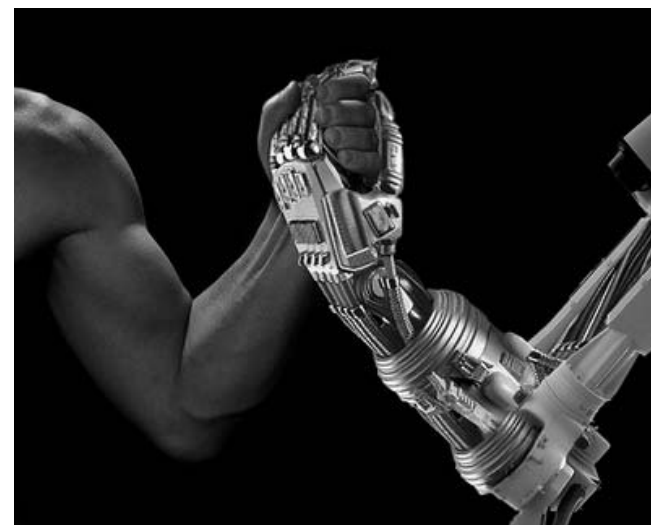http://www.bizbash.com/will_these_tech_advances_change_the_future_of_events/new-york/story/25226/

Let's discuss.

● Which kind of occupation will be neither replaced by the machines nor outsourced for the next 30 years?

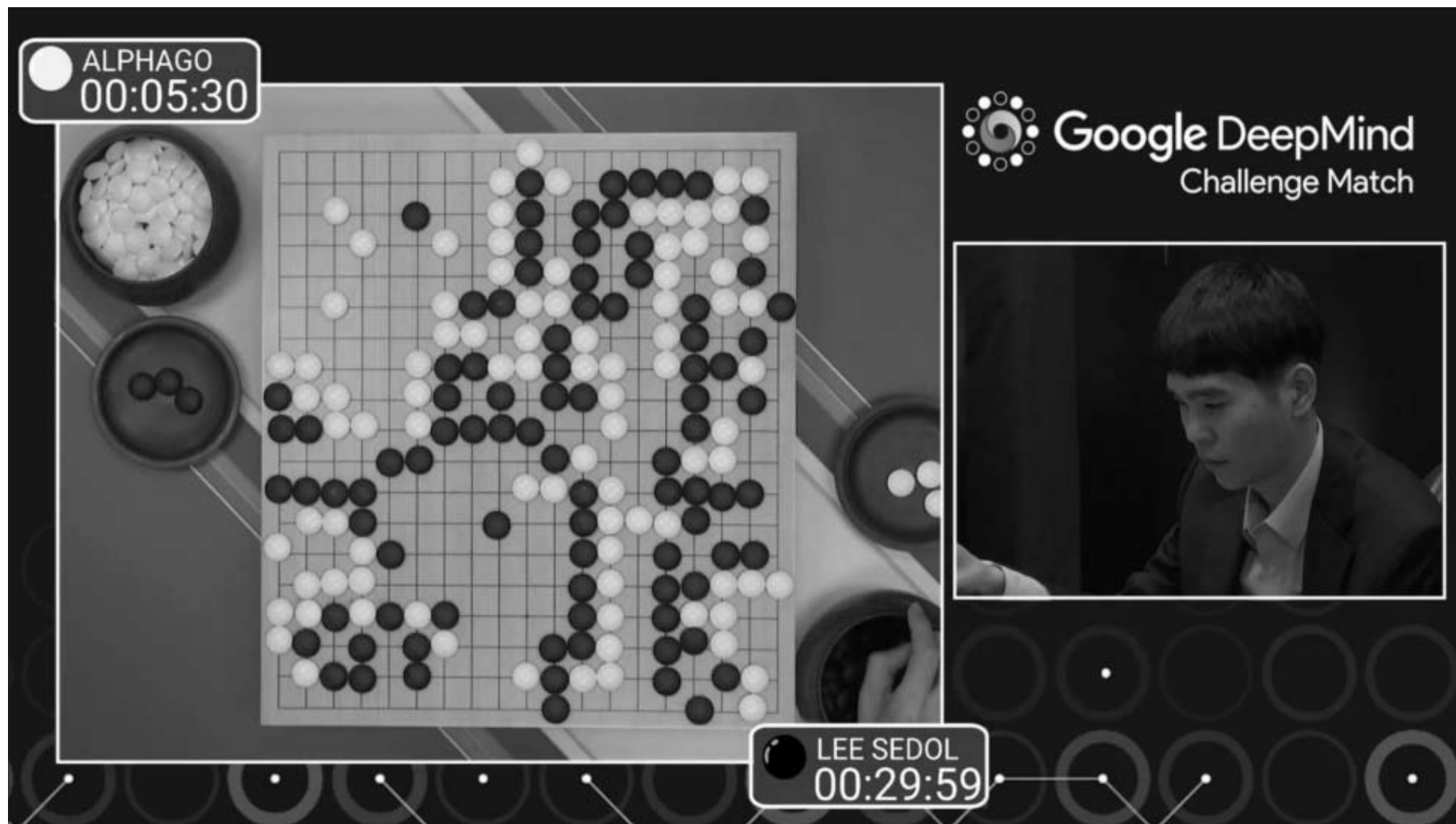
http://www.clotureclub.com/jobs/

In order not to be replaced, what kind of skills do we need that the machines don't have?

● Creative, innovative, analytic thinking

● Problem-solving skills for complex, unstructured, open-ended, non-routine problems

● Face-to-face, human-touch, communication skills (e.g. negotiation, persuasion, writing)

● Entrepreneurship and leadership

● anything else?

http://www.kansasbob.com/2011/02/man-vs-machine.html

Google DeepMind Beats Go Champion!

http://nerdist.com/google-deepmind-beats-legend-lee-sedol-in-game-one-of-five-game-go-series/

Google DeepDream Draws Arts!

https://news.artnet.com/market/google-inceptionism-art-sells-big-439352

We are **NOT doomed**.

● Advances in technologies are creating new opportunities and increasing demands for different skills.

■ Techs destroy some jobs but create new ones too, with the skills in the previous page.

● Tech developments have historically increased the size of the economies for the last several centuries.

● If you can survive in the waves of new technologies, you'll be more thriving than ever before.

How to survive? – Be Ambidextrous

● You'll need to develop multiple skills and abilities to survive.

● Having one major may not be enough.

● Double major or graduate degree in a _distant_ field

● so that, when you lose a job, you can jump into another occupation right away.

Changes in Wages for Full-Time, Full-Year Male U.S. Workers, 1963-2008
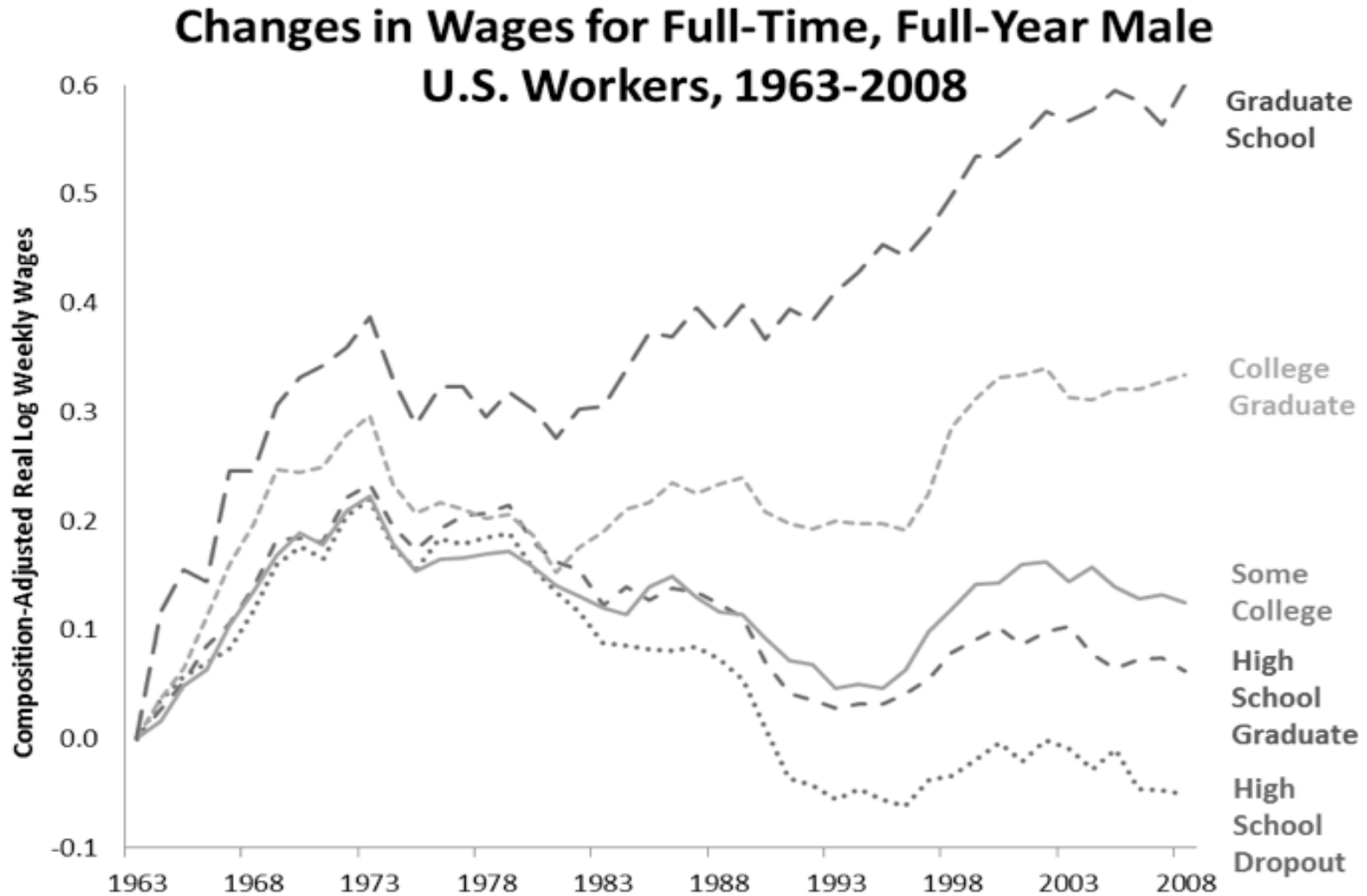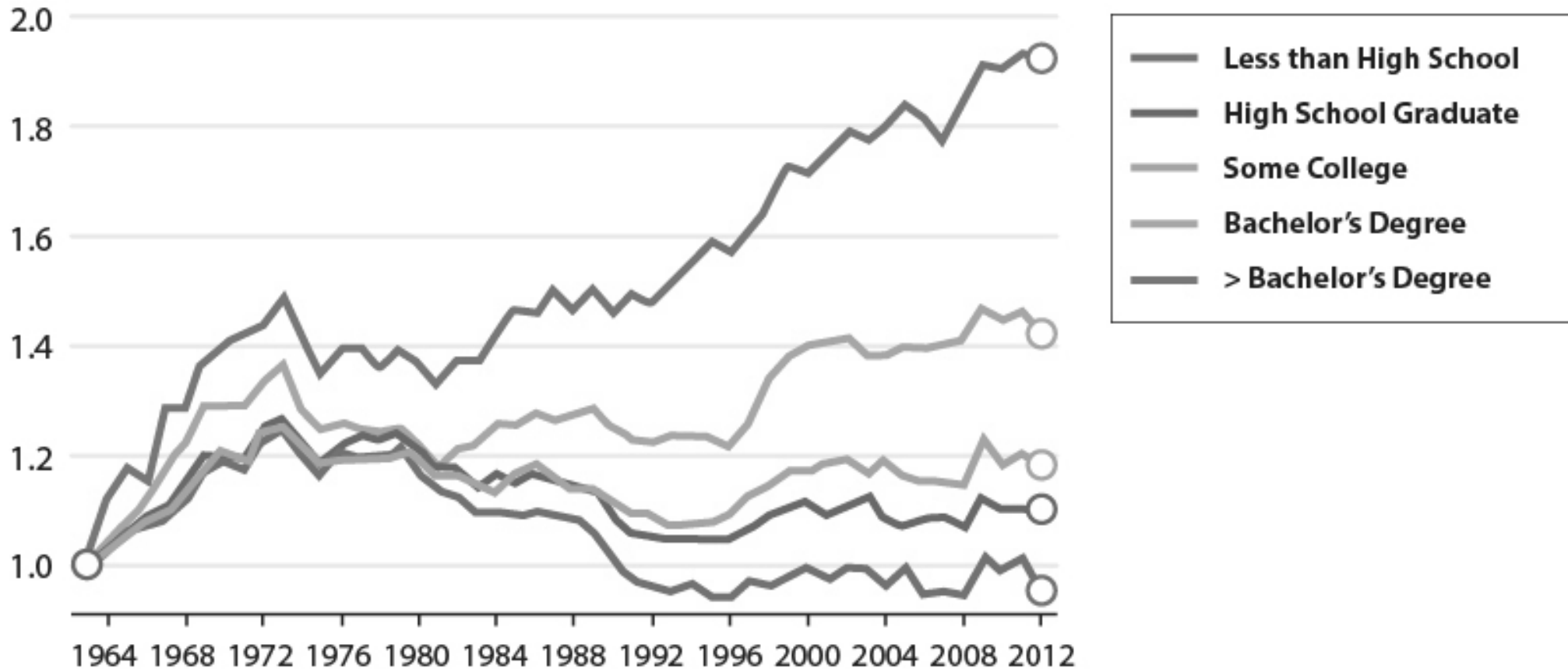
Figure 3.5: Wages have increased for those with the most education, while falling for those with the least. Source: Acemoglu and Autor analysis of the Current Population Survey for 1963-2008.

To make money, go to a graduate school!

Changes in Wages for Full-Time Male U.S. Workers

Legend:
- Less than High School
- High School Graduate
- Some College
- Bachelor's Degree
- > Bachelor's Degree

http://opportunityproject.ets.org/choosing-our-future

Forbes / Tech

JUL 29, 2015 @ 09:45 AM   **833,901** VIEWS

That 'Useless' Liberal Arts Degree Has Become Tech's Hottest Ticket

Such creativity can't be programmed. Instead, much of it is minted by one of Slack's 180 employees, Anna Pickard, the 38-year-old editorial director. She earned a theater degree from Britain's Manchester Metropolitan University before discovering that she hated the constant snubs of auditions that didn't work out. After winning acclaim for her blogging, videogame writing and cat impersonations, she found her way into tech, where she cooks up zany replies to users who type in "I love you, Slackbot." It's her mission, Pickard explains, "to provide users with extra bits of surprise and delight." The pay is good; the stock options, even better.

What kind of boss hires a thwarted actress for a business-to-business software startup? Stewart Butterfield, Slack's 42-year-old cofounder and CEO, whose estimated double-digit stake in the company could be worth $300 million or more. He's the proud holder of an undergraduate degree in philosophy from Canada's University of Victoria and a master's degree from Cambridge in philosophy and the history of science.

http://www.forbes.com/sites/georgeanders/2015/07/29/liberal-arts-degree-tech/

How to survive? – Continue to Learn

● Some of the things you are learning here will probably be *obsolete* in the next couple of decades.

● New knowledge keeps produced in an increasingly faster rate.

● Will need to know not only how to use certain software tools, but also how to learn new technology that is not invented yet.

● Will need to be flexible and to transform yourself anytime with new knowledge and skills

● Always be vigilant over and aware of technology trends and take advantage of them

ANALYTICS

Data Scientist: The Sexiest Job of the 21st Century

Harvard Business Review

by Thomas H. Davenport and D.J. Patil

FROM THE OCTOBER 2012 ISSUE

Big Data, Big Paycheck

Median salary for analytics professionals and those specifically within data science, by level of experience.

Up to 3 years	Analytics professionals	$65,000
	Data scientists	$80,000
4 to 8 years		$85,000
		$120,000
9+ years		$115,000
		$150,000

Note: Data do not include managers   Source: Burtch Works   The Wall Street Journal

https://hbr.org/2012/10/data-scientist-the-sexiest-job-of-the-21st-century/
http://www.wsj.com/articles/SB10001424052702304819004579489541746990638

How to survive? –
Be valuable, differentiated, and irreplaceable

● According to the five-forces model, differentiated and unique products/services can

- lessen rivalry among existing competitors and

- lower bargaining power of buyers.
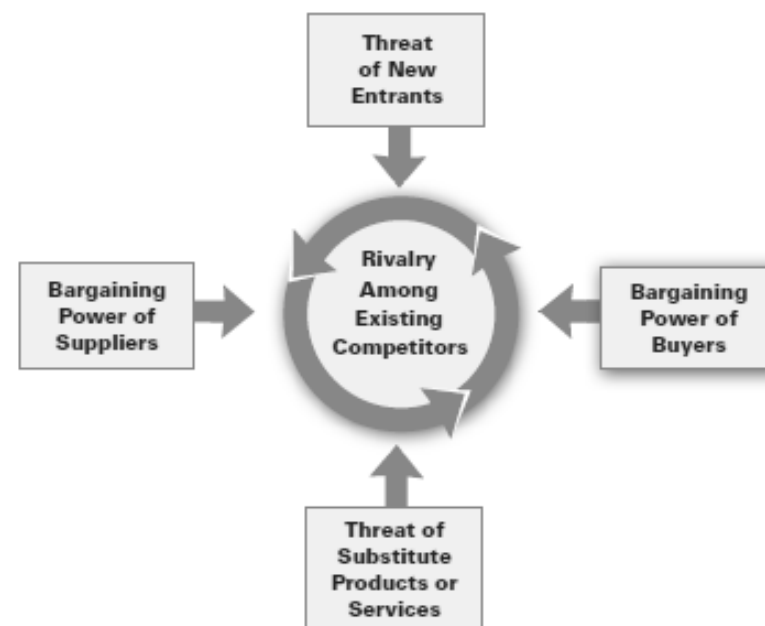
Why should we hire you? (1/2)

● How would you answer? How would you sell yourself?

http://www.cnn.com/2009/LIVING/worklife/07/20/cb.why.should.hire.you/

If the interviewer asks what you've learned here, what would you say?

Topic	Cases
IT and Competitive Strategy	Otis Elevator Trinity Health
Business Value of IT	San Francisco Airport San Diego Schools B&K Distributors
Cost of IT	IVK
Strategic IT Outsourcing	IVK
IT Risk Management	IVK
Enterprise Architecture	IVK
IT-Driven Competitive Strategy	ITC eChoupal Airbnb

Why should we hire you? (2/2)

● There are three finalists for one job position. Only ONE will be hired.

● Explain why you should be the one to be hired to your interviewer. Sell yourself!

Marketing Graduate

Computer Science Graduate

YOU!

Job Offers to Mr. Barton

- What are the three choices to Mr. Barton?

- Which opportunity would you advise Mr. Barton to take? Why?

- Can he become a CEO someday? Is he a good CEO material, compared to other executive candidates?

- Remember *"IT department is positioned to understand how the business works better than any other department"* (p. 11)?

CIO

More CIOs Are Gaining Stature As Business Strategists

CIOs are earning business credibility, sharpening cus... strategic profile, according to our 2013 State of the CI

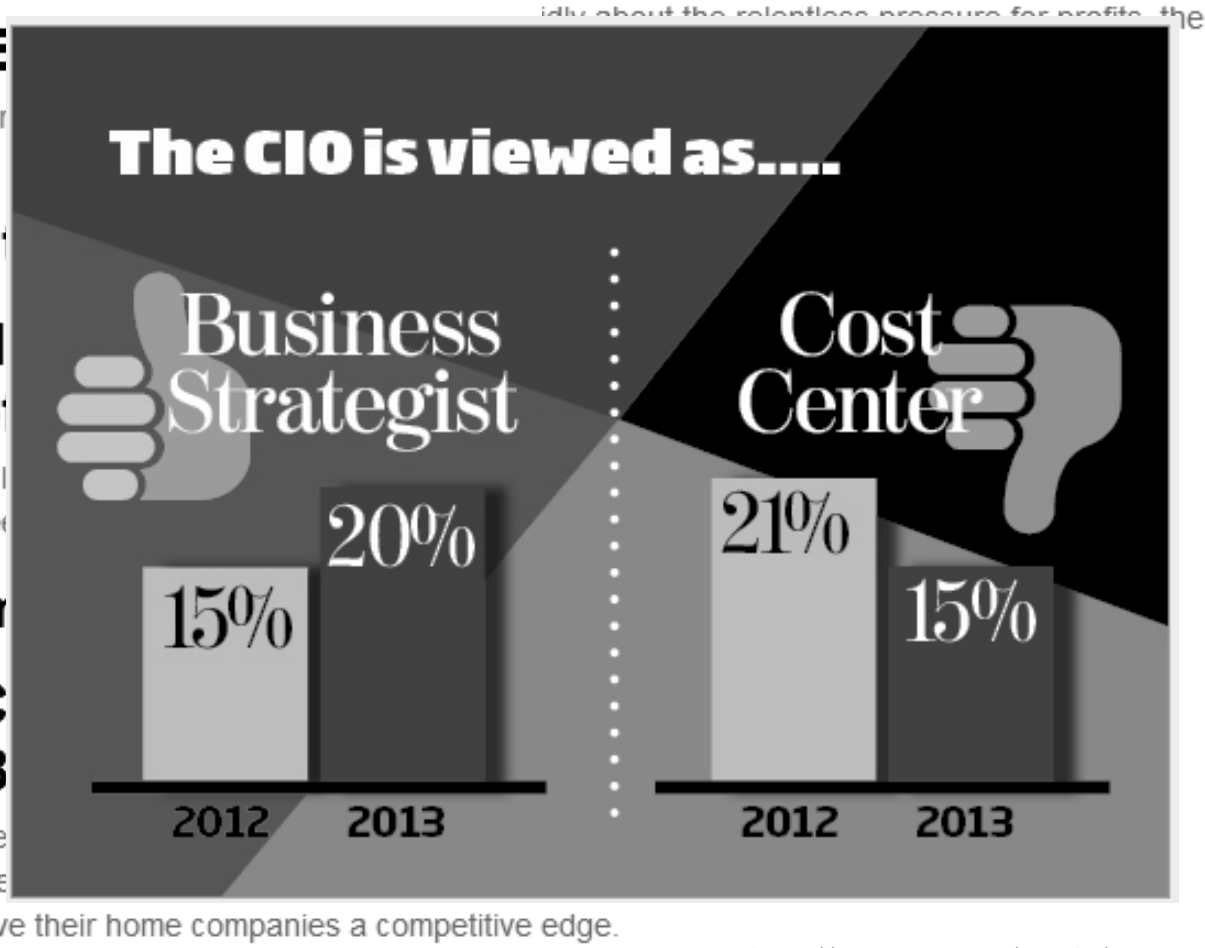## CIOs Share How They Made the Leap to CEO

CIO Pay Tied to Overall E

Our exclusive research reveals how much top-tier... with their companies' fortunes.

idly about the relentless pressure for profit, the

Innovative CIOs Show How With IT

A select few CIOs are generating cold hard cash thr... We rounded up examples of CIOs who generate re... sales or developing a product or service sold exter...

N

o

IT

ne

CIO Helps Civil War-Era Com Digital Future

Western Union has survived dramatic business uphe... venerable company survive the digital payments revo...

C

B

Re

the

give their home companies a competitive edge.

The CIO is viewed as.....

Business Strategist
2012: 15%
2013: 20%

Cost Center
2012: 21%
2013: 15%

http://www.cio.com/article/723858/

Do you want to become like Mr. Barton?

● Would you like to be a successful executive like Mr. Barton in the future?
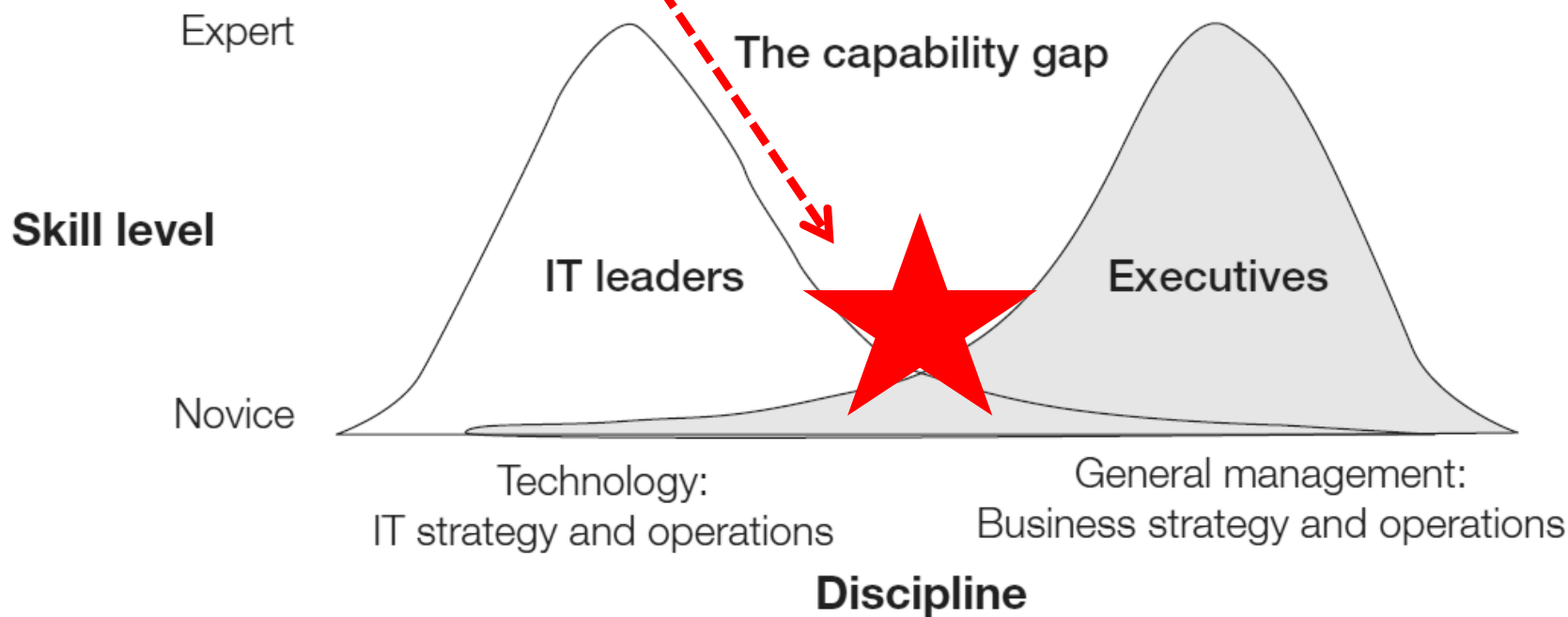
● If you do, what would it take to be a great CIO?

http://www.fastcompany.com/1790016/inspired-facebook-nation-obamas-chief-disruptor-brings-startup-culture-govt
http://www.techweb.com/news/47903044/wal-mart-s-way.html
http://www.memphisbioworks.org/bionotes/summer10_MCAN.html

Are you here?

The IT leader/general manager capability gap

Are you ready to be…?

- A capable <u>*business* leader</u> specialized in technologies who speaks in business languages and can explain to anyone

  - How IT management should be aligned with competitive strategies

  - How IT helps firms create business opportunities and achieve sustainable competitive strategies

  - How IT resources contribute to value creation in the business and government sectors

  - How to lead organizational transformation and innovation with IT

  - How to manage risks borne out of IT that firms depend on

Risks to MIS Majors

- A recruiter might say,

  Well, she/he knows a little bit about business and a little bit about IT too. I get that, which is fine. But I don't think she/he knows either deep enough. I would rather hire a real business major or a real engineering major.

- What would you say to this recruiter?

- If you don't want to hear this, what should you do?

http://findtheclient.com/2012/02/how-to-win-skeptical-clients/

What's in your competitive advantages?

- What should be your competitive advantages as an MIS major
  - that differentiate yourself from other majors?
- What should be your core competencies
  - that you can do better than anyone else?
  - Core competencies have to be valuable and inimitable.

Knowing that both business and IT,

- What can you do?
- What *specific skills* do you have?
  - a translator between business people and IT people
  - an ability to translate business problems to technical requirements
  - an ability to use IT to discover new opportunities
  - understanding of finance/accounting
  - understanding of managerial implications of IT (e.g. tradeoff in IT risk management)
  - drawing diagrams

CIOs Struggle with the Great Talent Hunt

Finding IT pros with business skills has always been a bear. So award-winning CIOs are taking radical steps to train, recruit or grow the hybrid staff they covet. (Plus: Meet the new members of the CIO Hall of Fame and the Ones to Watch winners.)

By Stephanie Overby
Wed, May 01, 2013

💬 4 Comments

"Business savvy comes from years of experience working on the business side, generally at a level high enough to have a broad cross-functional perspective," says Dave Smoley, a 2013 CIO Hall of Fame inductee. "Because technical competence comes from years of experience working and training in math, science and technology, it is rare to find both in one individual." Smoley, until recently the CIO of Flextronics International, joined pharmaceutical company AstraZeneca as CIO on April 15.

"It's hard for tech people--even middle managers on up to senior managers--to think the way that the business thinks," says Teri Takai, CIO for the Department of Defense and a 2013 CIO Hall of Fame inductee. "They tend to explain things from their own perspective."

CIOs Struggle with the Great Talent Hunt

Finding IT pros with business skills has always been a bear. So award-winning CIOs are taking radical steps to train, recruit or grow the hybrid staff they covet. (Plus: Meet the new members of the CIO Hall of Fame and the Ones to Watch winners.)

By Stephanie Overby
Wed, May 01, 2013

💬 4 Comments

At the DoD, Takai's lieutenants excel at highly technical projects, but she reminds them that their technical solutions are only as good as their ability to communicate them to senior defense leaders. "I tell them you have to use Aunt Linda language," she says. "How would you explain this to your mother, assuming she's no expert. Or your neighbor?"

At SquareTwo Financial, it took time for IT employees to get comfortable with business discussions. "It's difficult for a developer to stand up say, 'I'm going to show you what my product does and do it in a way that a business person can understand it.' Not, 'Hey, I wrote this code this way and here are my SQL statements,' but, 'Here's the business value of why I designed this the way I did,'" Weeks says.

My Suggestions (1/3)

- You have to be an expert in two areas.

- It is easy to find an expert in one area, but not in two or more.

- An expert in at least one <u>technology</u> area

  - database, business intelligence, system analysis and design, security, project management, and so forth

- An expert in at least one <u>functional</u> area or one <u>industry</u>

  - Finance, accounting, marketing, management, strategy, or operations

  - Retail, manufacturing, hospitality, finance, government, healthcare, and so forth

My Suggestions (2/3)

- What should differentiate you from engineers?

- Communication skills
  - a translator between business-side and technology-side

- Finance / accounting
  - Will this technology create value to my customers and company?

- Understanding of customers and competitors
  - What do customers want?
  - What would competitors do?

Norman Augustine, a former President of Lockheed Martin

*I have concluded that one of the stronger correlations with advancement through the management ranks was **the ability of an individual to express clearly his or her thoughts in writings**.*

http://rescommunis.olemiss.edu/2008/09/03/norman-r-augustine-at-the-university-of-mississippi/
https://www.aacu.org/publications-research/periodicals/one-cannot-live-equations-alone-education-life-and-work-twenty

An email from a former student

I wanted to reach out and thank you for being my professor in MIS 301 and MIS 411 at GMU. After graduating from Mason's School of Business last summer with degrees in Accounting and ISOM, I started working as a Technology Analyst at Freddie Mac in their IT engineering department. After a little while in engineering, I realized it wasn't a good fit due to my limited technical skills and due to my passion for business. I recently interviewed internally at Freddie Mac for a position in IT Strategy. I took the textbook for MIS 411 (Adventures of an IT Leader) and one of my executive reports to my interview and it helped me land the position. I will soon be starting in the IT Strategy space for Freddie Mac and am very much looking forward to the opportunity, as it involves concepts and things I learned in your MIS 411 class, my favorite class during my time in college. So thank you, and I hope you are doing well.

My Suggestions (3/3)

● What should differentiate you from business managers?

● Knowledge on current, up-to-date technologies

  ▪ What you have learned here will be obsolete in a matter of years. DO NOT stop reading technology news or magazines.

● Curiosity and willingness to try something new and innovate.

  ▪ Don't be afraid to try something new, to yourself, to your company, to your colleagues.

  ▪ Be an early adopter, an innovator, and a change leader.

Technology News Sites to Recommend

- MIT Technology Review (http://www.technologyreview.com/)

- BusinessWeek (http://www.businessweek.com/technology)

- CIO Magazine (http://www.cio.com/)

- InformationWeek (http://www.informationweek.com/)

- Government Technology (http://www.govtech.com/)

- ZDNet (http://www.govtech.com/)

- NextGov (http://www.nextgov.com/)

The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn.

- Alvin Toffler
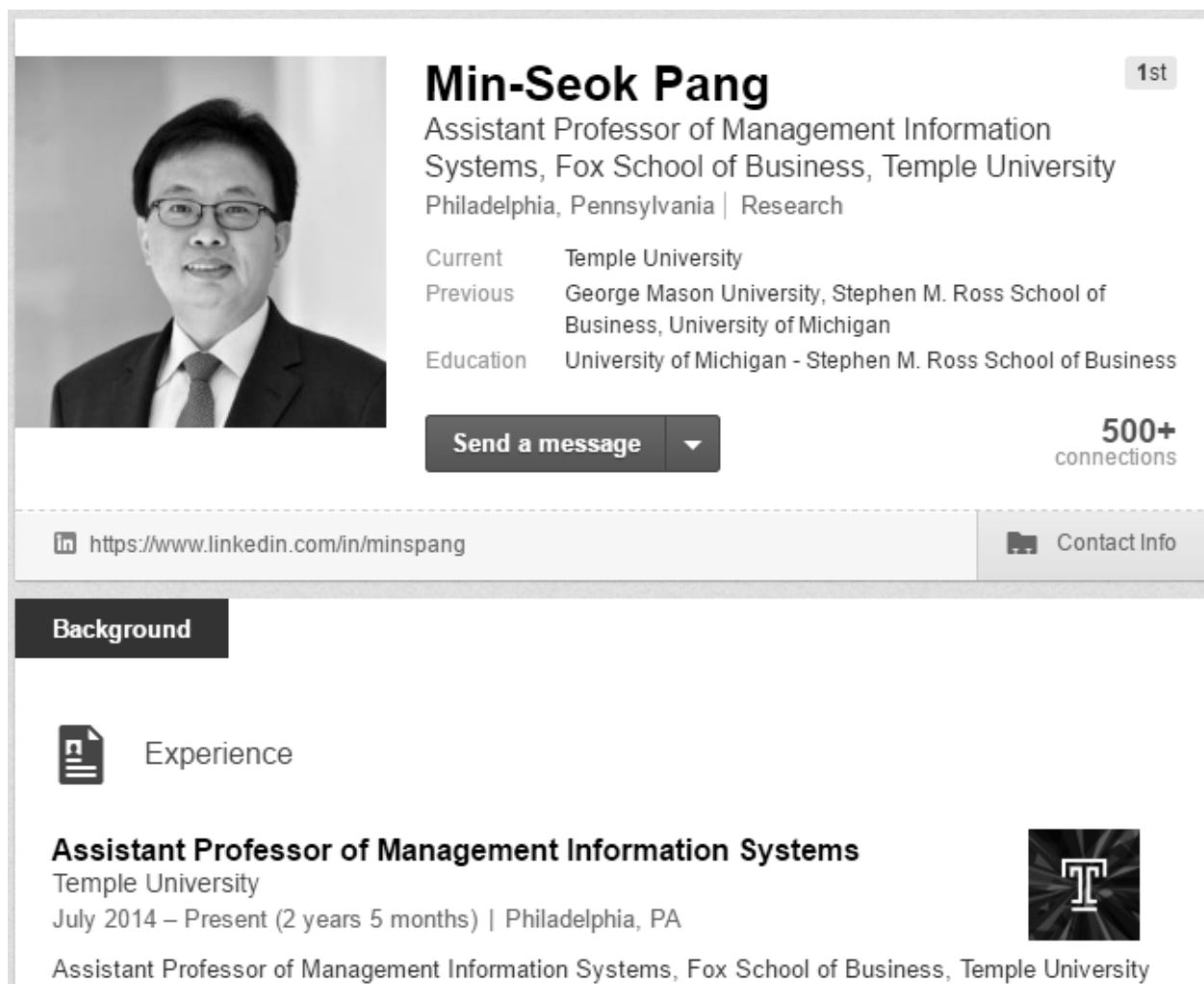
GOOD LUCK

to your career and future endeavors!

Connect with me at LinkedIn!
http://www.linkedin.com/in/minspang