Crunching The Numbers: 10 minutes on what jobs will be left in 10 years

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Future of Work, I

- McKinsey believes as much as 45% of current jobs could be replaced using technology that already exists;
- Gartner predicts one in three jobs will be converted to software, robots and smart machines by 2025;
- According to an Oxford University Study, about 47 percent of total US employment is at risk;
- OECD: across the 21 OECD countries, only 9% of jobs are automatable.
Why so many different predictions?

- “Predictions are easy, especially about the far future!”
  - Paraphrasing Albert Einstein, Nils Bohr, Mark Twain, or Yogi Berra

- Let’s look at the past instead!
US Manufacturing

US Real Manufacturing Output vs. Employment, 1947 to 2014

- Manufacturing Output (billions of 2014 dollars)
- Manufacturing Employment (millions)

- $0B to $2,400B on the y-axis
- 1950 to 2010 on the x-axis

The chart shows the relationship between real manufacturing output and employment over the years from 1947 to 2014.
Driving Force: Automation

Real US Manufacturing Output per Worker, 1947 to 2014

$200,000
$160,000
$120,000
$80,000
$40,000

2014 dollars

Sources: BEA and BLS

$40,000 in 1955

$85,000 in 1997

$171,000 in 2010
The Great Coupling


© 2012 Andrew McAfee (@amcafee)  
Sources: Census Bureau, Bureau of Labor Statistics
The Great Decoupling


© 2012 Andrew McAfee (@amcafee)
Sources: Census Bureau, Bureau of Labor Statistics
How Common Is Poverty?
Percent of Americans who have experienced poverty after age 25
Based on Panel Study of Income Dynamics data from 1968 to 2009
Mark Rank, Thomas Hirschl, and Kirk Foster, *Chasing the American Dream*, forthcoming

At least 1 year of poverty  At least 5 years of poverty

<table>
<thead>
<tr>
<th>Age</th>
<th>%</th>
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<td>8.7%</td>
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<td>21.3%</td>
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<tr>
<td>55</td>
<td>37.1%</td>
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<tr>
<td>60</td>
<td>38.9%</td>
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Civilian Labor Force Participation Rate - Bachelor's degree and higher, 25 years and over (LNU01327662)


Shaded areas indicate US recessions.
2013 research.stlouisfed.org
Former Workers on Disability

Number Of Former Workers On Disability

10 Million

1985: 3
1990: 4
1995: 5
2000: 6
2005: 7
2010: 8
Labor Share of National Income

Labor's share of US national income

51% of GDI

Quartz | qz.com

Data: FRED, BEA
Growing Inequality

Percentage Change in Income 1980 to 2013

- Bottom 90%
- Top 10% to 1%
- Top 1% to 0.1%
- Top 0.1% to 0.01%
- Top 0.01%

Source: politicsthatwork.com
Job Polarization

Smoothed Changes in Employment by Skill Percentile 1980-2005

100 x Change in Employment Share

Skill Percentile (Ranked by Occupational Mean Wage)
Routine vs Non-routine Jobs

Break Your Routine
When jobs are sorted by whether the work is routine, all job growth since 2001 has been in nonroutine jobs. Percent change in jobs, since 2001, 12-month moving average.

Source: Henry Siu and Nir Jaimovich for Third Way | WSJ.com
The middle class is shrinking in most U.S. metropolitan areas, and lower- and upper-income tiers are gaining share. How the share of adults in lower-, middle- and upper-income tiers changed in 229 metropolitan areas from 2000 to 2014.
Automated Driving
30 companies are now working on self-driving cars -- estimated market: $2T over next decade

Technical issues are expected to be resolved within a decade

Many legal issues need to be resolved

Profound business disruption!

Massive loss of jobs (10% of US jobs involve operating a vehicle): automation of the whole supply chain is expected - more than 10M US jobs!
Over the past 35 years, automation has had a very harsh impact on working-class Americans!

We can expect impact over the coming 35 years to be equally harsh if not harsher!