Economic Challenges of the Second Machine Age

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The Second Machine Age

Changing the world requires two things:

- **Power system**: move or transform things
- **Control system**: decide where and how

**Industrial Revolution = Physical Power**

- Steam engine (and Internal combustion engine, Electricity)
- Mostly a complement to humans

**Second Machine Age = Mental Power**

- Computers, Software, Big Data, Machine Intelligence
- Complement or substitute?
State of Understanding, 2004

Uniquely Human Abilities

1. Autonomous mobility and fine motor control
2. Language and complex communication
3. Pattern matching and unstructured problem solving
Machine Intelligence

Interacting with physical world
  – Fine and gross motor control
  – Vision and other senses

Language
  – Voice recognition
  – Natural language processing
  – Creating narratives

Problem Solving
  – Answering unstructured questions
  – Rule based analysis
  – Pattern recognition and classification
Siri
Voice recognition

Lionbridge
Translation

Automated Insights
Authoring News Stories
Chargers Beaten by Patriots, 23-14

December 3, 2014 12:19 AM

Automated Insights

The Chargers gave up scoring plays of 49 yards and 69 yards and fell to the Patriots, 23-14, at home.

Philip Rivers finished 20 for 33 with 189 yards, one touchdown and one pick. Tom Brady completed 28 of 44 passes for 317 yards, two touchdowns and one pick for the Patriots.

Ryan Mathews ran for 44 yards on 11 attempts. Malcom Floyd snagged three passes for 54 yards with a touchdown.

The San Diego defense struggled to defend the passing attack, but was able to slow down the run, giving up 87 yards rushing and 317 passing while taking back one fumble for a touchdown. They brought down Brady for one sack.

Patriots tight end Rob Gronkowski was impressive, churning out 87 receiving yards and one touchdown. Wide receiver Julian Edelman also had a good game with 141 receiving yards and one touchdown.
Forbes Earnings Preview: Apple

by Narrative Science

Analysts have become increasingly bullish on Apple (AAPL) in the month leading up to the company’s second quarter earnings announcement scheduled for Tuesday, April 24, 2012. The consensus earnings per share estimate has moved up from $9.60 a share to the current expectation of earnings of $9.86 a share.

What to Expect:
The Digital Frontier

WILLIAM WILKINSON'S "AN ACCOUNT OF THE PRINCIPALITIES OF WALLACHIA AND MOLDAVIA" INSPIRED THIS AUTHOR'S MOST FAMOUS NOVEL

$18,200 $23,440 $5,600
Accuracy and Questions Answered on *Jeopardy!*
What does this mean for the economy?
$300 BILLION PER YEAR

Sources: Census Bureau, Bureau of Labor Statistics
What’s going on?
The Hard Truth

Digital progress makes the economic pie bigger. But there is no economic law that everyone, or even most people, will benefit.
Three Sets of Winners and Losers

1. High Skilled vs. Low & Mid Skilled Workers
Skill Disparities


- Graduate School
- College Graduate
- Some College
- High School Graduate
- High School Dropout
Waves of Change

First Wave
- Software and Internet
- Media & Entertainment
- Telecommunications

Second Wave
- Retailing
- Wholesaling
- Finance

Third Wave
- Logistics
- Manufacturing
- Construction
- Military
- Agriculture

Fourth Wave
- Professional Services
- Medicine
- Education
- Government

Fifth Wave
- Domestic help
- Non-routine manual labor
- Child and elder care
- Domestic help
- Non-routine manual labor
- Child and elder care
Three Sets of Winners and Losers

1. High Skilled vs. Low & Mid Skilled Workers

2. Capital vs. Labor
Capital vs. Labor

Corporate Profits After Tax as % of GDP & Non-Farm Labor Share, 1947-2013

Source: research.stlouisfed.org
Three Sets of Winners and Losers

1. High Skilled vs. Low & Mid Skilled Workers

2. Capital vs. Labor

3. Superstars vs. Everyone Else
New World Order
Labor, Capital, and Ideas in the Power Law Economy

By Erik Brynjolfsson, Andrew McAfee, and Michael Spence
Superstars
What is to be done?
“Digital technologies change rapidly, but organizations and skills aren’t keeping pace. As a result, millions of people are being left behind.”
The New Grand Challenge

• Digital technologies will continue to accelerate.

• Our skills, organizations and institutions are lagging.

• Business as usual won’t solve this problem.

➢ We need to reinvent our economy and society to keep up with accelerating technology
The Initiative on the Digital Economy

“We need to invent new economic institutions, industries, business models, and ways of organizing work that will thrive in the digital age.”

PIONEERING RESEARCH

Analyzing Our Digital World
The Initiative on the Digital Economy (IDE) is a research effort focused on the impact of digital technology on businesses, the economy, and society. Launched by MIT Sloan in 2013, the Initiative includes faculty from across MIT.

UPCOMING EVENTS

Nov. 18
Roundtable
A invitation-only event for IDE supporters.
The New Landscape

• What challenges and opportunities do you see?

• What are your concerns and questions?
To learn more, visit:

http://digital.mit.edu/erik

http://digital.mit.edu/ide

http://secondmachineage.com