

ICT, INNOVATION AND THE E-ECONOMY



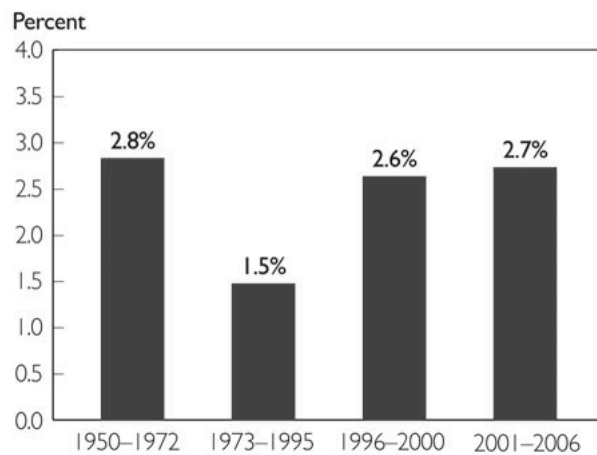
Erik Brynjolfsson
MIT Center for Digital Business
<http://digital.mit.edu/erik>

European Investment Bank, Luxembourg, October 27, 2011

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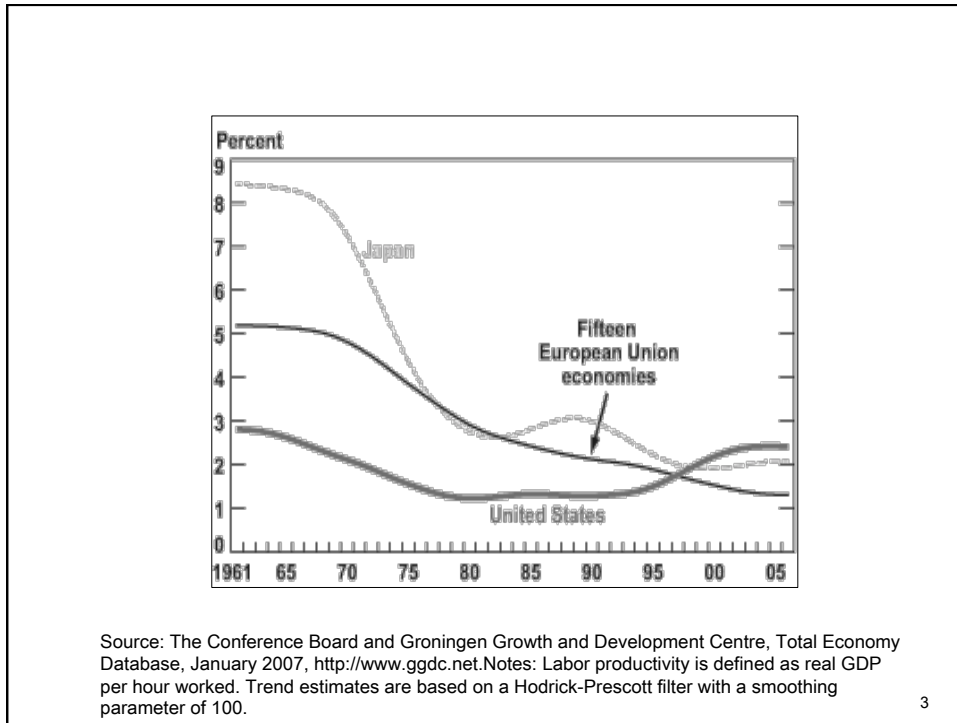
Generous support for this research was provided by the National Science Foundation and the MIT Center for Digital Business.

Average Annual Percent Change in U.S. Labor Productivity

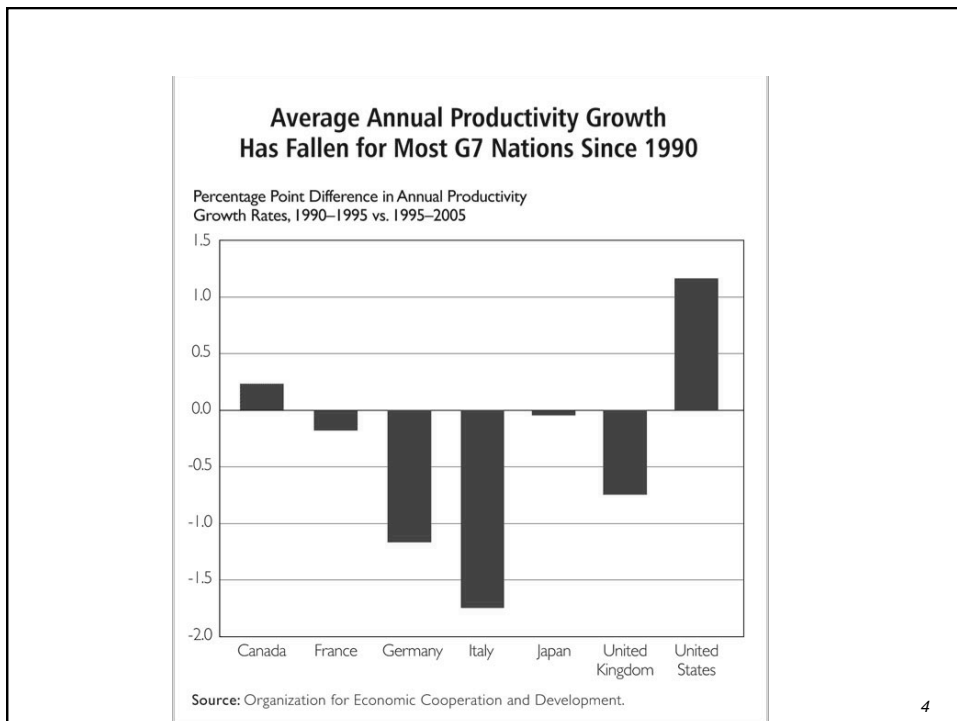


Source: Bureau of Labor Statistics.

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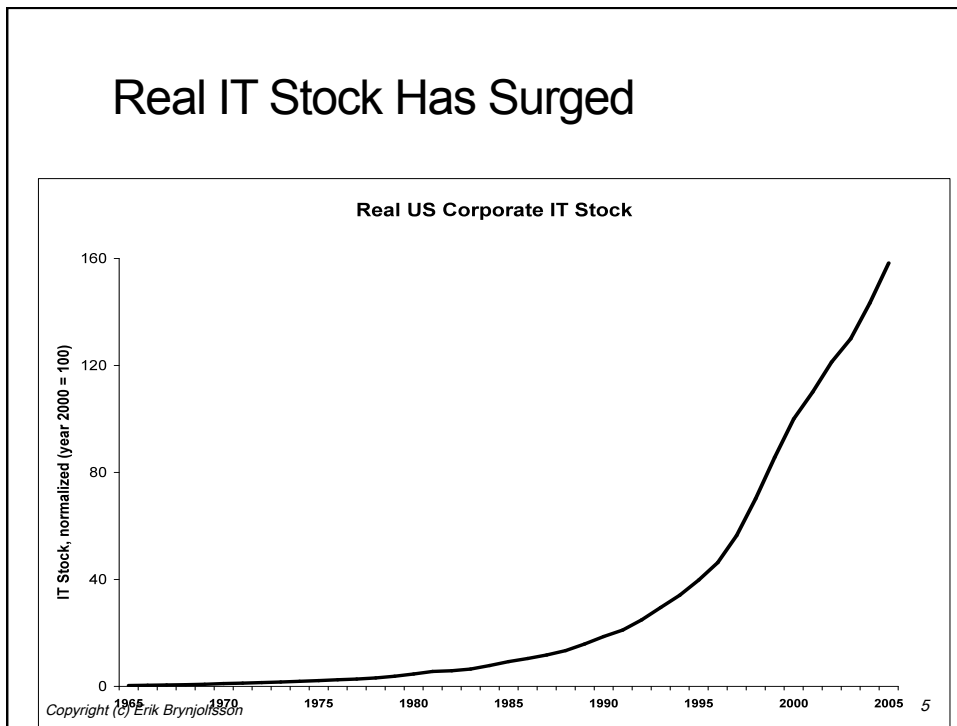


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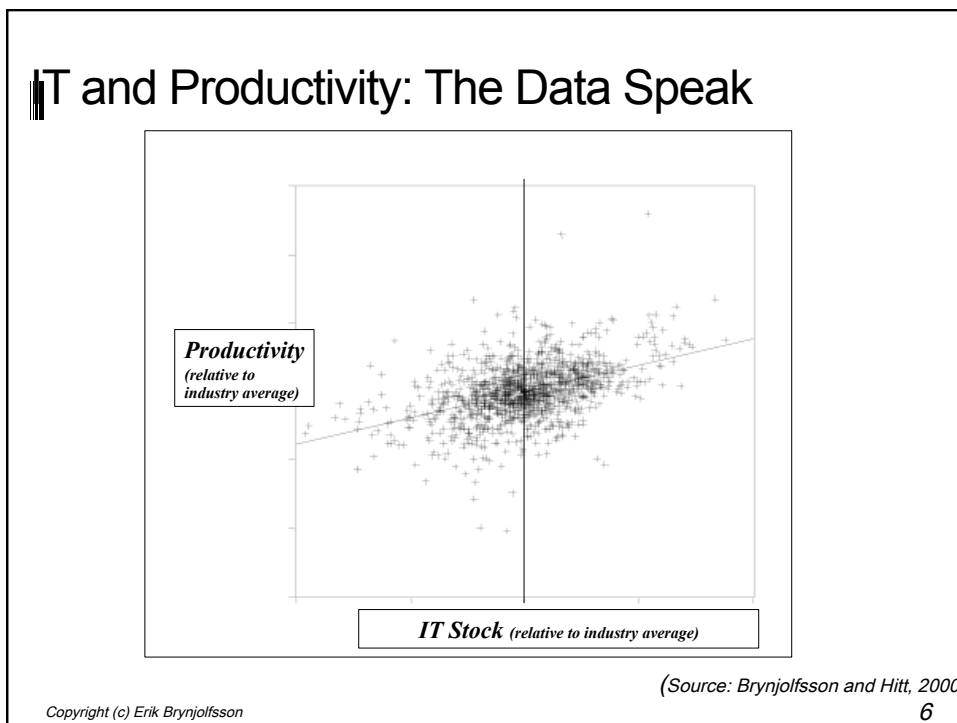


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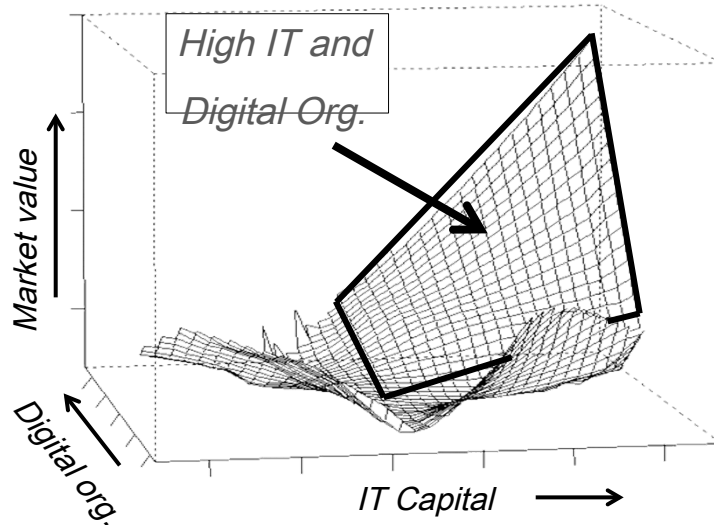
Real IT Stock Has Surged



IT and Productivity: The Data Speak

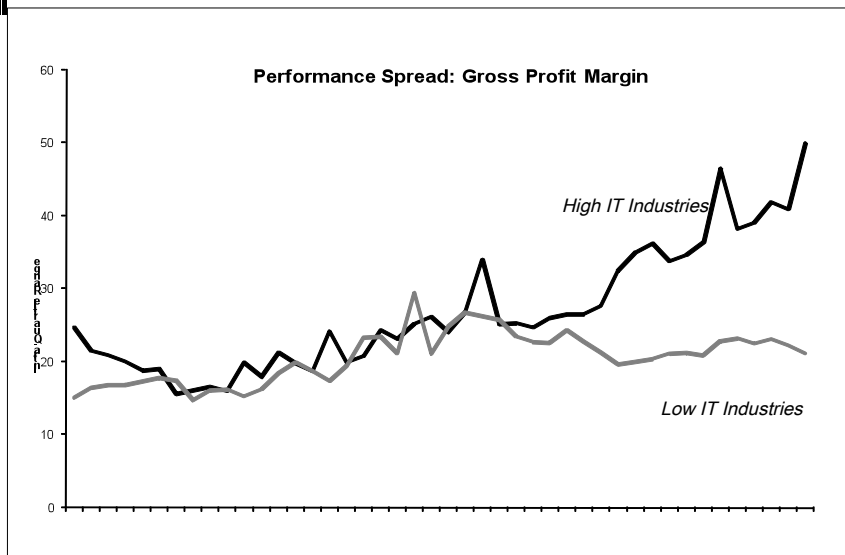


IT Pays off when it changes how companies work



Source: Brynjolfsson, Hitt, and Yang 2002

Corporate Performance Spread has Grown



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Source: Brynjolfsson and McAfee 2009 ⁸

ICT Enables Four Drivers of Innovation



Measure

Experiment

Share

Replicate

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Measure

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New Tools Beget Revolutions



The Nanodata Revolution



- Clickstream/Page views/Web transactions
- Web links/Blog references/Facebook
- Google/Bing/Yahoo Searches
- Email messages
- Mobile phone/GPS/Location data
- ERP/CRM/SCM transactions
- RFID (Radio Frequency Identification), Bar Code Scanner Data
- Real-time machinery diagnostics/engines/equipment
- Stock market transactions
- Twitter feeds
- Wikipedia updates
- Etc....

|| Data vs. HiPPOs



Truck Routing



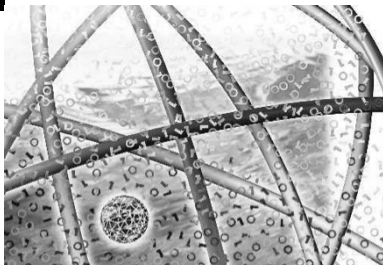
Wine Chemistry



Housing Sales

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|| Data Driven Decision-makers are Winning

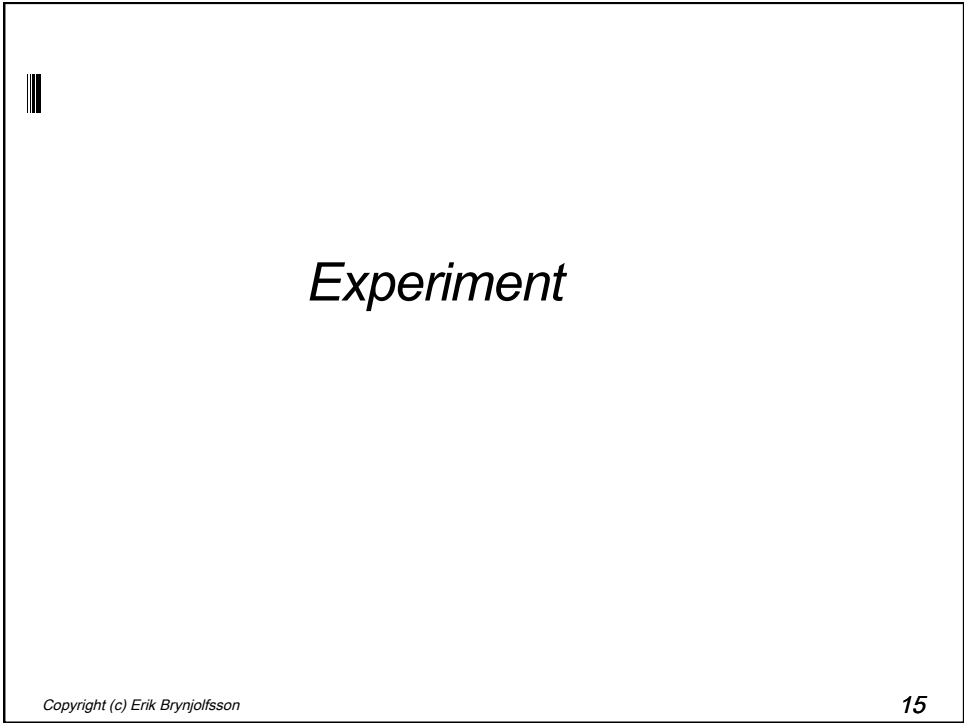


✓ Data-Driven Decision-makers:
4% higher productivity

✓ *Data-Driven Decision-makers:*
6% greater profitability and 50%
higher market value from IT



Source: Brynjolfsson, Hitt and Kim, 2011 14





Experimentation at Harrah's

Gary Loveman

- Zero executive experience
- Zero background in Casinos
- But, an MIT PhD who knows how to make numbers talk

Results


- Transformed Harrah's from second tier to number one gaming company in the world
- Completed a \$30.7 Billion LBO
- Introduced a culture of pervasive field experimentation
 - *"There are two ways to get fired from Harrah's..."*

"We have come out on top in the casino wars by mining our customer data deeply, running marketing experiments and using the results to develop and implement finely tuned marketing and services strategies that keep our customers coming back."

•-- Gary Loveman, CEO, Harrah's

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Share

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|| Cisco's Mac Wiki

- *Over 10,000 Macintosh users at Cisco, but no central IS support*
- *A few users established a wiki, where users could post tips, tricks, files, links and other content*
 - *Example: tip for using the Linux printers which were ubiquitous at Cisco*
- *Many users all over world got up to speed entirely via Mac Wiki*
- *Thousands of small ideas from hundreds of users*

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Scale

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What Does IT Do?

1. Replicate Bits

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The screenshot shows the Amazon.com product page for the book "Wired for Innovation: How Information Technology is Reshaping the Economy (Hardcover)" by Erik Brynjolfsson and Adam Saunders. The page includes the Amazon Prime logo, navigation links, a search bar, and product details. The price is listed as \$12.89, a 32% discount from the list price of \$19.96. The book is in stock and eligible for free shipping with Amazon Prime. The page also features a "Frequently Bought Together" section with another book, "IT Savvy", and a "Customers Who Bought This Item Also Bought" section with several other titles.

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 Member: Erik Brynjolfsson

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LOOK INSIDE! NUGS HOW THE MIGHTY FALL LOOK INSIDE! LOOK INSIDE!

What Does IT Do?

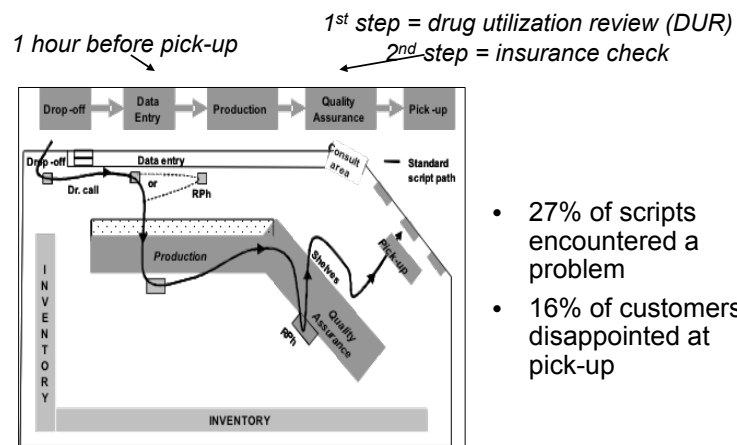
1. *Replicate Bits*
2. *Replicate Processes*

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Case Study: CVS

Basic 'script fulfillment process:



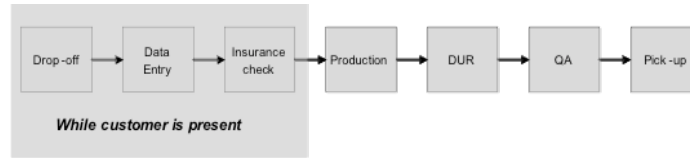
- 27% of scripts encountered a problem
- 16% of customers disappointed at pick-up

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CVS: Scale without Mass

New fulfillment process:

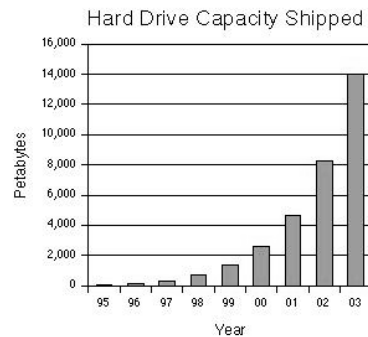
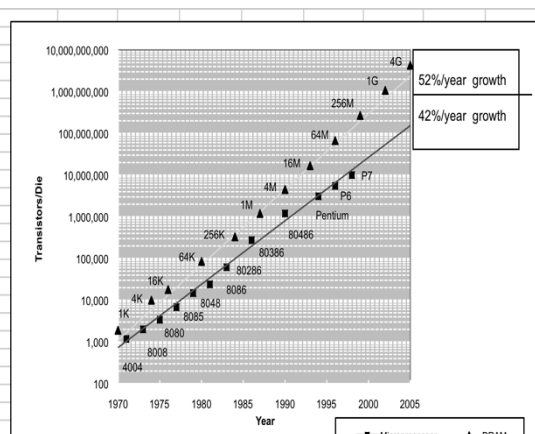


- Short-term results: customer satisfaction scores
 - Wait time satisfaction: 76 → 86
 - Overall pharmacy satisfaction: 86 → 91
- New process embedded in Enterprise IT (EIT)
 - 100% compliance
- Rapid roll-out to over 4,000 retail pharmacies

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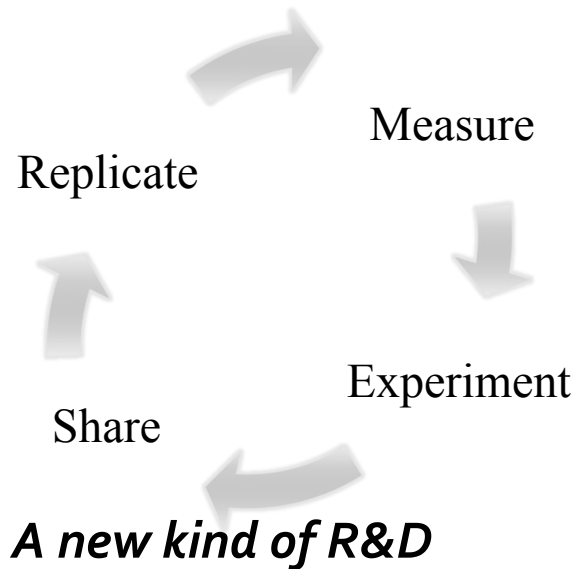
IT Reduces the Costs of Measurement, Experimentation, Sharing and Replication



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|| Synergies Amplify The Benefits



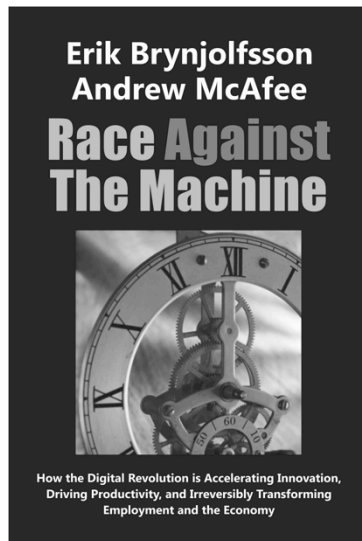
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|| Lessons from the Research

1. Productivity surge since 1995 linked to ICT revolution
 - IT is enabling business process changes and new ways to work
 - Dispersion in performance across firms is growing as leaders pull away from laggards
2. ICT enables four drivers of innovation
 - Measurement
 - Experimentation
 - Sharing
 - Replication
 - These techniques are more powerful when combined:
 - *A new R&D*

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Creating value while destroying incomes



“Computers are now doing many things that used to be the domain of people only. The pace and scale of this encroachment into human skills is relatively recent and has profound economic implications. Perhaps the most important of these is that while digital progress grows the overall economic pie, it can do so while leaving some people, or even a lot of them, worse off.”

Read the Book:

www.RaceAgainstTheMachine.com

Read the Papers:

digital.mit.edu/erik