



The MIT Center for Digital Business

<http://digital.mit.edu>

Wired for Innovation:

How IT is Reshaping the Economy

Erik Brynjolfsson
and Adam Saunders

Erik Brynjolfsson • Adam Saunders

WIRED

FOR INNOVATION

How Information Technology Is Reshaping the Economy

"Brynjolfsson and Saunders have written an important roadmap for future technology innovation. Anyone interested in the business and economics of information technology should read this book."

—Chris Anderson, Editor-in-Chief, *Wired*, author of *Free: The Future of a Radical Price*

Agenda

1. Technology, Innovation and Productivity in the Information Age
2. Measuring the Information Economy
3. IT's Contributions to Economic Growth
4. Business Practices that Enhance Productivity
5. Organizational Capital
6. Incentives for Innovation in the Information Economy
7. Consumer Surplus
8. Frontier Research Opportunities

Agenda

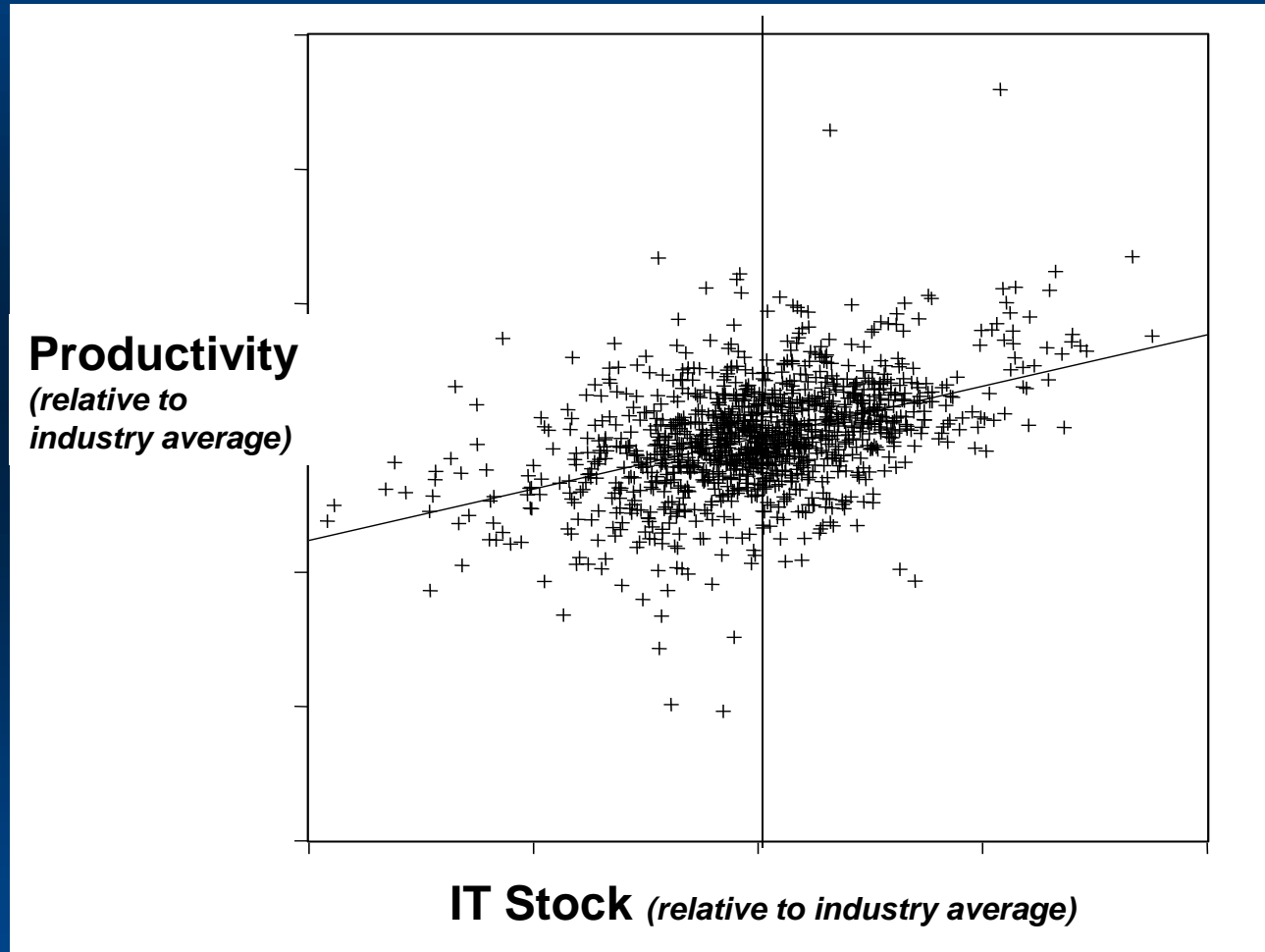
1. Technology, Innovation and Productivity in the Information Age
2. Measuring the Information Economy
3. IT's Contributions to Economic Growth
4. **Business Practices that Enhance Productivity**
5. **Organizational Capital**
6. Incentives for Innovation in the Information Economy
7. Consumer Surplus
8. Frontier Research Opportunities

Where Does Productivity Growth Come From?

- Not working harder
- Not using more capital
- Not using more resources
- Productivity growth comes from working **smarter**:
 - *New technologies*
 - *New techniques*

IT and Productivity: The Data Speak

Computers *are* associated with greater productivity...



...But what explains the substantial variation across firms?

Cost Structure of a Large IT Project

\$millions

Hardware Application, Web, and database servers including storage

\$0.8

Software ERP application Suite License
(HR, Financials, Distribution)
1,000 regular trained users, 2,000 casual users

\$3.2

Implementation 9 months to complete pilot site including
process engineering, apps configuration, and testing
30 external consultants at \$1,200 a day
30 internal staffers at an average salary of \$100,000

\$9.3

Deployment 3 external consultants at 9 sites for 3 months
9 internal staffers at each site for 6 month
5 days of user training
3 full-time training staff at an average burdened

\$7.5

Start-up Costs Total

\$20.5



Michael Dell

*What are the
key assets at
Dell?*

Computerization > Computers

IT Capital (10%)

**Technological
Complements (15%)**

**Organizational
Complements (75%)**

Intangible Assets

*are more important in
the Information Economy*

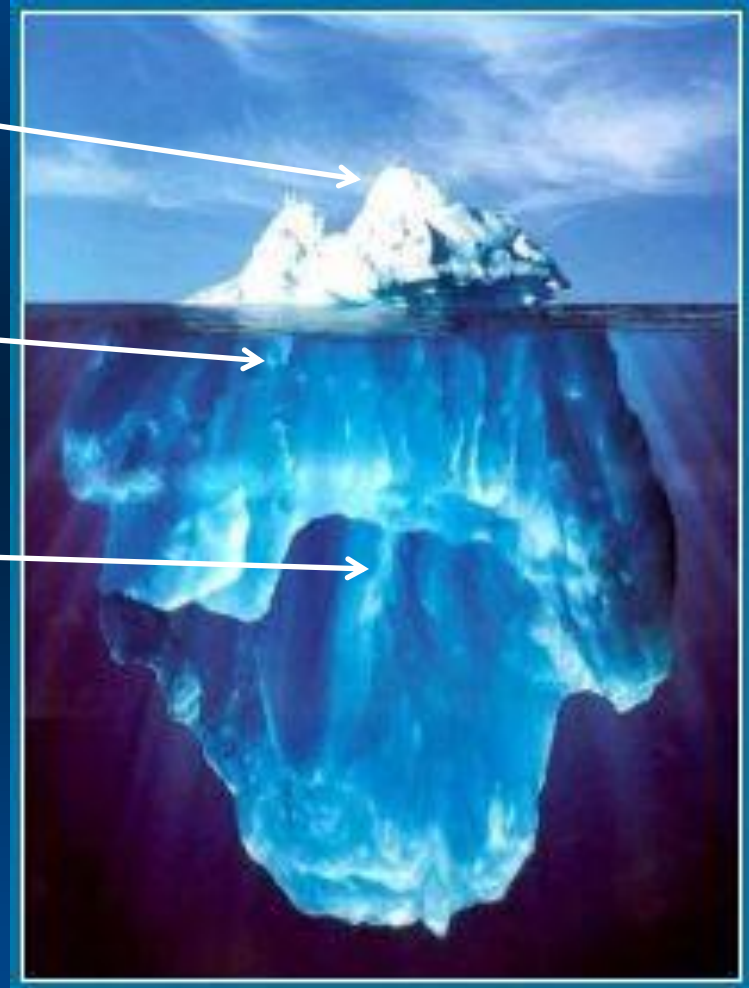


Image by Ralph Clevenger

MIT Analysis of Organizational Assets

Sample: 1167 large firms over 10 years
(10,473 observations)

- Four Principal Types of Data
 - Revenues and Market Value from S&P's Compustat II
 - Computer Capital from Computer Intelligence
 - Ordinary Capital, Labor, other Assets, R&D from S&P's Compustat
 - Organizational Assets from surveys we conducted
- Part of 5 year, \$5 million project at MIT
 - Support from the U.S. National Science Foundation
 - Additional support from BT, CSK and Cisco Systems via the Center for Digital Business

Business Performance depends on *Both* IT and “Organizational Capital”

1. *The “Digital Organization”*

A distinct corporate culture and organizational practices are found at most (but not all) heavy users of computers and Internet

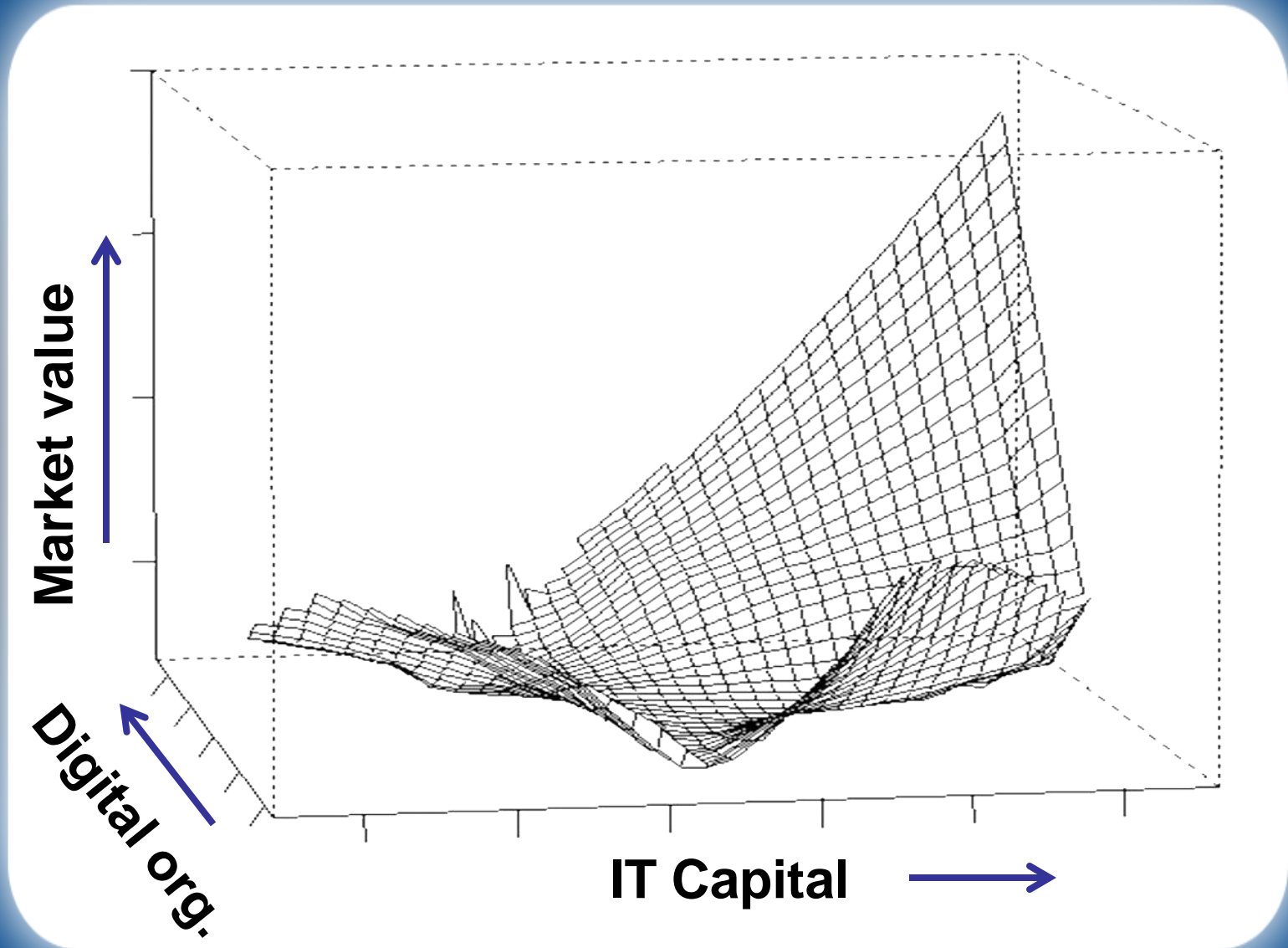
2. *Higher Productivity and Higher Market Value*

Firms that adopt the *Digital Organization* have higher performance

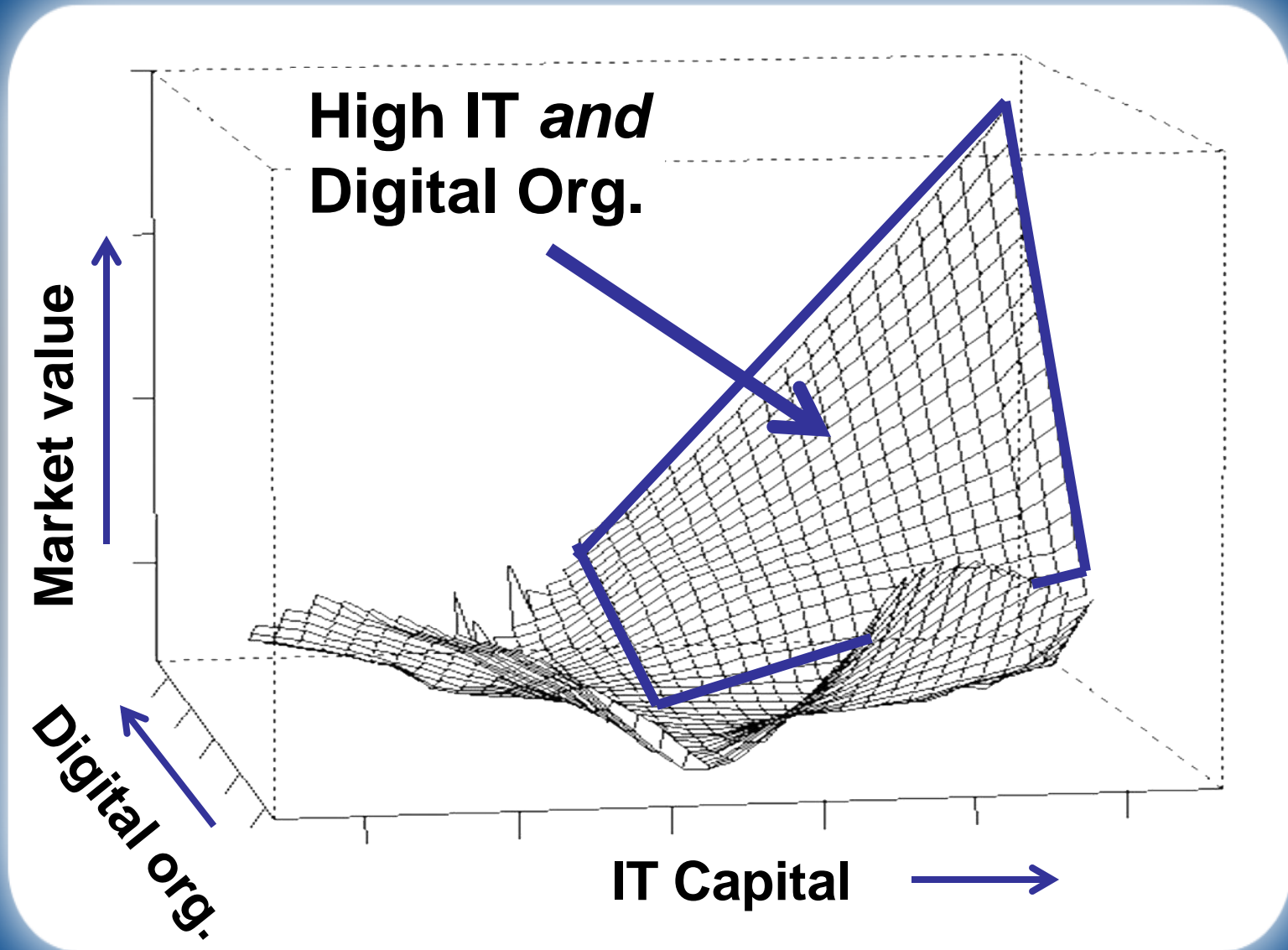
3. *IT and Digital Organization are Complements*

Firms that adopt the *Digital Organization* and simultaneously invest more in IT have disproportionately higher performance

Interactions Between IT and Digital Organization



Interactions Between IT and Digital Organization



Seven Practices of Digital Organizations

1. Move from analog to digital business processes
2. Distribute decision-rights
3. Foster open information access
4. Link incentives to performance
5. Maintain focus and communicate goals
6. Hire the best people
7. Invest in human capital

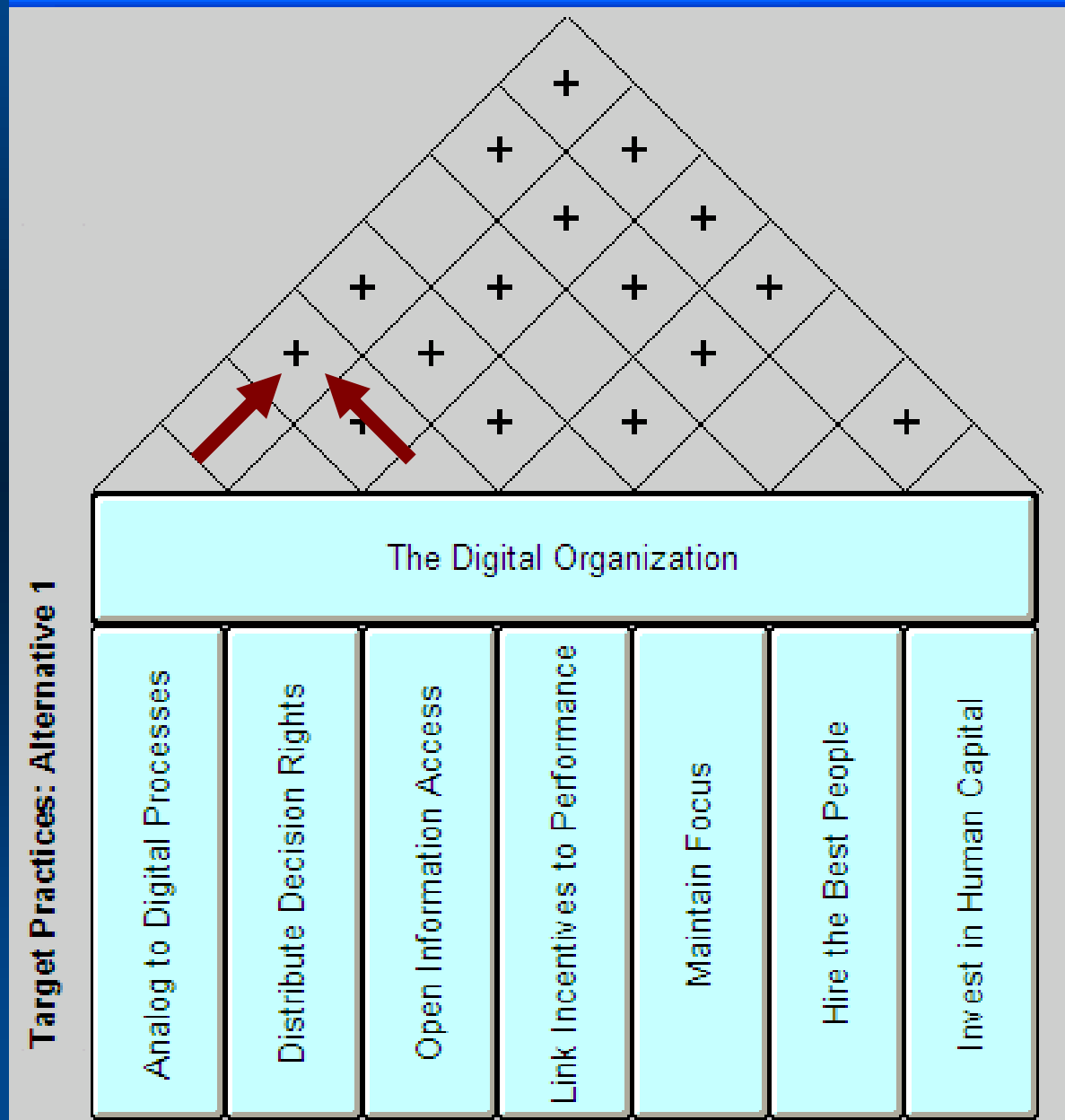
Why are these practices being adopted today?
Why not 100 years ago?

Finding: Employees Benefit, Too

- Firms which adopt Digital Organization have higher pay for their employees
 - From the top to the bottom of the pay scale
- Firms which adopt Digital Organization were less likely to have voluntary employee turnover
 - The reduced level of employee quits are an indicator of greater employee satisfaction
- A Win–Win
 - Also had findings of higher productivity and higher market value

If these practices increase productivity, why haven't all firms adopted them?

A Coherent System



Summary: The Digital Organization

1. IT: the catalyst for productivity surge...
2. ...but organizational capital is the bulk of the iceberg
 - *Payoff only when both investments are made*
3. Seven practices of the “Digital Organization”
4. These practices form a Coherent System

To learn more about this research,
please visit my website:
<http://digital.mit.edu/erik>

To Order the book, please visit:
<http://www.amazon.com/>

