“My argument is not that you don't need IT or that it's not important, but that it doesn't matter strategically and doesn't provide one company with a way to distinguish itself in any meaningful way from its competition.”

-Nicholas Carr
Technology Economics: Charting, Calibrating, and Taking Charge of Your Technology Economy

IT Does Matter

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Global Technology Spending

$4.2T =

$701 per person

Bigger than the GDP of 182 countries

One PC per person per year
Technology Balance of Trade

Technology Services Exported per $1 Imported

- United States: $1.00, $0.84
- China: $1.00
- India: $1.00
- $8.86
Technology Investment Rate of Change

2011 Versus 2009 Technology Investment per Worker

- **Ukraine**: 95%
- **India**: 77%
- **Brazil**: 60%
- **China**: 55%
- **U.S.**: 10%
The Pace of Change is Accelerating

Global Technology Spending for 2009 alone is greater than all of the 1980’s and 1990’s.
Agenda

Charting

• What is Technology Economics and why is it important?

Calibrating

• The Economy:
  What are we measuring? What are we missing? What should we be measuring?

• The Technology Economy:
  What are we measuring? What are we missing? What should we be measuring? What do we know about the dynamics?

Taking Charge

• How you can use your knowledge of your Technology Economy – within your business, in markets, and across the global economy – to gain insurmountable competitive advantage?
What is Technology Economics?

The study of the dynamics, measurement, and strategic use of IT investment as a critical lever and source of competitive advantage for nations, industries, and individual companies.
Economics Vs Technology Economics?

- Mainframes in Business 1960
- First “Computer” 1942
- Tabulating Machine Company 1896
- Adam Smith: Wealth of Nations 1776
- Aristotle 322 BC

Time Periods:
- 0 AD
- 1000 AD
- 1500 AD
- 1600 AD
- 1700 AD
- 1800 AD
- 1900 AD
- 2000 AD

Industrial Revolution
Why is Technology Economics Important?

Current economic indices are from the Industrial Age. They deliver limited insights, place emphasis on an aging set of drivers, and don’t acknowledge the impact of technology on the global economy.

We need to create a new view that integrates the interaction of technology...
Today’s measures have their origin in the industrial age.

- **Daily**
  - Dow Jones, NASDAQ, S&P

- **Monthly**
  - Housing starts
  - GDP
  - Unemployment
  - Consumer confidence
  - Manufacturing indices

- **Quarterly**
  - Corporate performance (10Q, 10K)
  - Brown Book
Why do Today’s Economic Measures Fail?

They don’t account for or help explain the patterns of performance we observe in the information age.

National productivity has accelerated through the “technology era.”

US Non Farm Business Productivity Change

1960-1980: The Mainframe Era
1991-2000: The PC/Emerging Internet Era
2001-Current: The Pervasive Computing/Pervasive Access Era
Why do Today’s Economic Measures Fail?

They don’t help us understand key linkages and they mask the new drivers of performance

Correlation of Non Farm Productivity to IT Investment
Change 1960-2009

$R^2 = .9835$
Technology Investment Rate of Change

They don’t enable us to detect the leading indicators of global competitiveness

2011 Versus 2009 Technology Investment per Worker

- **Ukraine**: 95%
- **India**: 77%
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- **China**: 55%
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Estimated Growth of Technology Investment per Worker – 2011 vs. 2009
Why do Today’s Economic Measures Fail?

They don’t acknowledge technology trends as a leading indicator of business cycles

**Evidence:** An index that mirrors the Leading Index of Economic indicators using Technology Measures appears to be a better indicator of future economic performance.
Why do Today’s Economic Measures Fail?

They don’t provide visibility into the role of the effective technology in shaping business performance and as a strategic differentiator.

An index of market performance of the technology leaders shows them to be more resilient than the F500, Dow Jones, or S&P 500.
Why do Today’s Economic Measures Fail?

They don’t even attempt to look at the societal impact of technology on quality of life.

- UN Human Development Index
- Knowledge Jobs
- Technology Innovation
- Technology Economy Index

Technology Economic Indices at the national level are better predictors of quality of life as measured by the UN’s Human Development Index.
How do We Measure IT Today?

Most commonly used measures are:

- IT as a % of Revenue
- IT as a % of Operating Expense
- IT spending per Employee
- IT Spend Distribution: Development vs. Maintenance vs. Infrastructure
- IT Spend Distribution: Run the Business Grow the Business
- IT Unit Costs: per Server, per MIPS, per Desktop, per GB Storage, per Help Desk Call, per Desktop
Why do today’s IT measures fail?

• All input focused – $$ people, etc.

• No output or outcome focus

• False transparency…
  IT things clearer to IT people…
  not to the business or constituents

• Most measures are static and
  not leading indicators
Why do Today’s IT Measures Fail?

The limitations in our understanding of Technology Economics limits our ability to fully leverage IT.

In the current economy – IT has not moved at the “speed of business”.

2009 vs. 2008 Compression

- Revenue: -19%
- Operating Expense: -26%
- IT Spending: -16%
Why do Today’s IT Measures Fail?

IT is viewed as a cost which can be cut versus an area to invest when the “going gets rough” to improve EPS

Model Company Tech Spend ($M)
- Total Tech Spend: $5,000
- Compensation: $1,800
- Contractors: $500
- Hardware Depreciation: $600
- Hardware Maintenance: $400

Model Company 10k (30% Pre Tax Margin)

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount ($M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Revenue</td>
<td>50,000</td>
</tr>
<tr>
<td>Non Interest Expense</td>
<td>35,000</td>
</tr>
<tr>
<td>Compensation</td>
<td>17,500</td>
</tr>
<tr>
<td>Comm &amp; Tech (Not Total Tech)</td>
<td>2,500</td>
</tr>
<tr>
<td>Occupancy</td>
<td>3,000</td>
</tr>
<tr>
<td>Other (Professional Fees, Advertising, Cleaning, Brokerage, etc)</td>
<td>12,000</td>
</tr>
<tr>
<td>Shares Outstanding (MM)</td>
<td>3,500</td>
</tr>
<tr>
<td>EPS (Pre Tax)</td>
<td>4.20</td>
</tr>
</tbody>
</table>

Current State
- EPS: $4.29
- PreTax Margin: 30%

If "IT was free"
- EPS: $5.71
- PreTax Margin: 40%

If "IT labor was free"
- EPS: $4.94
- PreTax Margin: 35%

Take down Tech Spend 10%
- EPS: $4.43
- PreTax Margin: 31%

Take down Tech Spend 20%
- EPS: $4.57
- PreTax Margin: 32%

Take down Tech Spend 20% and OpEx 10%
- EPS: $5.57
- PreTax Margin: 39%

Add $500M Tech Spend to reduce OpEx 15%
- EPS: $5.57
- PreTax Margin: 40%

Add $1,000M Tech Spend to reduce OpEx 20%
- EPS: $7.07
- PreTax Margin: 43%

EPS from increasing IT spend is potentially higher than if all IT was cut!!

Spend into the skid
Why do Today’s IT Measures Fail?

They don’t connect to outcomes that are critical to the business environment and even mask our ability to explore such interactions.

**Evidence:** Top performers have driven higher pre tax margin for a given level of technology investment.
Why do Today’s IT Measures Fail?

They don’t enable a true business facing view of investment.

- Grow Revenue
- Protect Revenue
- Reduce Cost
- Avoid Cost
- Manage Risk

Technology Investment and Business Performance

Increase the spread to increase margin.
What are the “Right Measures”?

Benchmark Audiences:
- CEO
- CFO
- LOB Management
- CIO
- IT Directors
  - Applications and Operations
- Procurement
- Portfolio Managers
- Procurement
- Sourcing Oversight
- HR

Measures that “connect the dots” of your technology economy

Business Based Benchmarks
- Technology Cost of Goods
- Technology Value of Goods
- Technology Innovation Value
- Technology Agility

Total Technology Spend/Financial Benchmarks
- IT Financial vs. Business Financial /Volume Benchmarks

IT Spend
- IT Spend in LOB.

Head Counts
- New Measures

Catalog-Based Benchmark
- Unit Costs
- Service Levels
- Service Coverage
- Service Organization

Driver-Based (Causal) Benchmarks
- Productivity/Support Ratios
- Quality
- Reliability
- Process

Service Delivery and Service Quality Benchmarks
- Availability
- Satisfaction
- Applications/Components/Services

Procurement/External Costs
- Process
- Procurement/External Costs
What is the Right Way to Use Measurement?

Measurement models that encourage charting your technology economy and foster an understanding of its dynamics and formulation of hypotheses to enhance performance – a forensic approach

“Market Data Feeds” for Calibration

Today’s Performance
Critical Technology Performance Indicators

Thematic Scorecard(s)
- Lagging Indicators
- Leading Indicators

Balanced Scorecard(s)
- Finance
- Customer
- Process
- People

Tomorrow’s Performance
Critical Technology Performance Indicators

“Deep Dive On-Demand Benchmarks”
What are Some of the “New” Measures?

Measures that make the business-IT connection

The IT Cost of Goods has continued to rise as all sectors have become more technology intense.
What are Some of the “New” Measures?

Measures that connect the dots – IT Cost of Goods

$250 Per US Citizen Per Year
$57,717 Per Patent
$0.17 Per Mile
$0.07 Per Passenger Mile
$8,036 Per Year per Soldier
$2.63 Per Megawatt
$65 Per Hospital Bed Per Day
What Dynamics Can We Chart?

- Financial Models
- Scale Economics
- Unit Costs
- Agility Drivers
- Investment Patterns
- Value Generation
- Scale Economics
- Unit Costs
Charting and Calibrating: IT Intensity

There is at least a 4 to 1 variation of the intensity of IT -- cost and impact relative to revenue and operating expense – across key sectors of our economy.
Charting and Calibrating: Management Dynamics

Put the "Squeeze on IT"

- Cut staff
- Use more offshore labor
- Vendor renegotiation
- Cancel discretionary projects

Dilute IT Value
Charting and Calibrating: Economies of Scale

Physical Servers (20% UNIX/80%Wintel/Linux)
Scale Economies

$X = 2007$ Competitors and $Y = 2009$ Competitors in terms of placement on the scale economics curve and do not represent actual competitor unit costs
Charting and Calibrating: Moore’s Law

Scale shifts and economics

A “market basket” of infrastructure services that cost ~$500M+ in 2007 will likely be delivered by the most efficient companies for ~$295M in 2010 and for $132M by those who migrate to the “cloud” and “commons” by 2015.
Total Cost = Volume x Unit Cost
The most opportunistic time for technology investment is likely during an economic downturn.
Charting and Calibrating: Variable Cost

IT has a high fixed cost and fixed capacity history

<table>
<thead>
<tr>
<th>Model Company Tech Spend</th>
<th>% Variable Today</th>
<th>% Variable Future State Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Tech Spend</td>
<td>36%</td>
<td>60%</td>
</tr>
<tr>
<td>Compensation</td>
<td>50%</td>
<td>70%</td>
</tr>
<tr>
<td>Contractors and Sourcing</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Hardware Depreciation</td>
<td>0%</td>
<td>33%</td>
</tr>
<tr>
<td>Hardware Maintenance</td>
<td>25%</td>
<td>50%</td>
</tr>
<tr>
<td>Software Expense</td>
<td>25%</td>
<td>50%</td>
</tr>
<tr>
<td>Software Capitalization</td>
<td>0%</td>
<td>50%</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>25%</td>
<td>60%</td>
</tr>
<tr>
<td>T&amp;E</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Recruiting</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Facilities/Rent</td>
<td>10%</td>
<td>33%</td>
</tr>
</tbody>
</table>

At best companies today can compress IT costs by 36%. The rest is fixed cost – IT cannot move at the “speed of business”
Taking Charge

Use Forensics to Assess and Optimize Performance

- Cascades from few strategic key measures to form initial hypotheses to a larger set where opportunities might be evident.

- Has a strong focus on a side by side view of technology, operations, and business performance.

- Follows the “evidence”, formulating hypotheses about opportunities and collecting facts to identify the ones that will produce high yield results.

*Forensics = Scientific techniques used for investigation and hypothesis formulation*
Can you answer these questions?

• Is IT “sized to your business”?
• Are your IT commodity costs competitive?
• Are you moving at the speed of your competitors?
• Are you leveraging the marketplace?
• Can you compete at your scale?
• Does your IT economic model offer the agility you need?
• Are you getting an appropriate return on your technology investment?
• Are you investing in the right new technologies at the right time?
• Are you managing your technology economy or it is managing you?
Make Technology Economics Work For You

- Optimize and Resize
- Consider “The Commons”
- Realign, reclaim, and reinvest
- Enable agility
- Leverage the supply chain
- Fund IT *forward* and “follow the money”
- Strategically engage the business and become an IT Savvy enterprise
- Engage in aggressive technology scanning and innovation

More importantly Chart and Calibrate YOUR Technology Economy
Synthesis

Technology economic principles are clearly a critical aspect of the global economic engine.
An understanding (and foresight) into technology economics is a driver of a nation's competitiveness and ability to enable quality of life for its citizens.
Synthesis

In the near future the way we look at the economy and forecast its performance will change

Technology Economy Index / IT GDP

Technology Leadership Index

Technology Consumer Confidence Index

Technology CPI / Market Basket Index
Companies that are technology leaders – those that successfully can optimize technology for operational leverage, technology for growth, technology to empower its workforce and technology as an investment for innovation – are the business leaders.
Final Words

“The most opportunistic time for technology investment is during an economic downturn; it is the only area in which investment can change the operating profile of an organization – doing so effectively can create an insurmountable competitive gap. Bad IT economics will put you on the wrong side of this gap and may even be creating advantage for your competitors.

**IT Does Matter** – It is strategic and meaningful if managed wisely.”

- Howard Rubin
IT Does Matter

Technology Economics:
Charting, Calibrating, and Taking Charge of Your technology Economy

Thank you

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