NBA 600: Day 7
IT and Productivity
(McKinsey Report)
17 February 2004

Daniel Huttenlocher
Today’s Class

- How IT enables productivity growth
  - McKinsey study from Oct 2002

- In context of strategic importance
  - Cost-of-business vs. differentiating IT investments
  - Degree of competition and rate of adoption

- Also focus on what is needed for successful IT deployments
  - To extent strategic, also need outstanding execution
Basic Findings

- Productivity acceleration of 1990’s concentrated in 6 sectors
  - Semiconductors, computer manufacturing, telecommunications, wholesale, retail, securities

- IT alone not a factor – important as enabler of innovation and competition
  - Improved processes, products, services, distribution
    - Specific to industry sector and often to particular firm – no “silver bullet” or “killer app”
  - Degree of improvement not driven by IT spend
Industry Cases

- More detailed investigation of 3 sectors
  - Retail, semiconductors and retail banking
- Consider how IT investments at sector and firm level tie to “performance levers”
  - Labor productivity
    - Capital for labor, labor efficiency, labor effectiveness
  - Goods and services
    - New, higher value, more value from current
  - Capital productivity
    - Asset utilization, non-labor costs
Biggest Impact of IT

- Tailored to sector-specific business processes and explicitly tied to “levers”
  - Non-labor costs
    - Real-time inventory management in retail
  - More effective labor, capital for labor
    - Credit scoring software in banking
    - Design quality in semiconductors
- Deployed incrementally, building capability over time
- Co-evolved managerial and technical innovation – “value stack”
Tiering of IT Investments

- From necessary costs to potential strategies
- Basic cost of business
  - Necessary to be competitive
- Extended cost of business
  - Needed by leaders or larger firms
- Differentiating
  - Allowing firms to gain cost, product or service advantage
- Next frontier
  - Pilots of potential new differentiators
# IT Tiering for Retail Sector

## Next Frontier Investments

- 
  - Improvements in store presentation tools
  - Self-checkouts
  - Electronic tags

## Differentiating Investments

- 
  - Revenue management applications
    - Pricing and markdown optimization applications
      - Target implemented price and markdown optimization engine, which statistically evaluates bundles of complementary goods
      - JC Penney implemented pricing/markdown solutions for certain categories
  - Merchandise planning applications
    - Analytics/complex algorithms to perform demand forecasting, assortment and allocation planning, and replenishments at "almost" optimum level (e.g., subclass, item, level) depending on category and subsector
    - Saks uses "buyer workmate tool" for merchandise allocation
    - Wal-Mart clusters stores based on multiple variables and statistical similarities

## Extended Cost of Doing Business Investments

- 
  - "Premium" VCS/VMS
    - RetailLink used by Wal-Mart to collaborate/coordinate with vendors
    - "CPPR-like" systems implemented by Target and leading apparel retailers for close collaboration with suppliers
  - Data warehouses
    - Enterprise or functional data warehouses to perform "simple" and "complex" queries on transactional data
    - Data mining/flexible reporting tools

## Distribution and Logistics Applications

- 
  - TMS
  - Core in-store operations solutions
    - POS systems
    - Labor scheduling tools
    - Inventory receiving and returns tools

## Cost of Doing Business Investments

- 
  - Payroll module
    - Payroll systems
  - Financials module
    - Accounting
    - Financial reporting
  - HR module
    - HR/employees information systems
    - Perpetual inventory systems
      - "Basic" VCS/VMS (e.g., EDI)
  - Infrastructure systems (e.g., transactional databases, network management, security, storage systems)

Source: MGI analysis
Tiering and Strategy

- Over time most IT investments become cost of business
  - No longer competitive advantage

- Rate varies greatly
  - Extent of competition in industry
  - Ability to use IT in achieving complementary advantages such as scale
    - E.g., WalMart, Target
  - Ability to stay ahead through better learning
    - Virtuous circle of advantage by out innovating
    - E.g., WalMart, Target, Fedex from 70’s-90’s
**IT and Strategy**

- Difficult to achieve and sustain competitive advantage through IT investment alone
  - More likely to be and remain differentiating when coupled with other advantages
    - Scale, substantial changes in business process, associated learning effects
- Sectors vary greatly in strategic value
  - Retail leaders able to turn data into valuable information for inventory, planning, pricing
    - Not yet commoditized
  - Banking advances quickly adopted, benefit customers not individual firms
Relation to Carr Debate

- Takes simplistic view of IT in “silver bullet” terms
  - Provides competitive advantage or not
  - Used to, but doesn’t any longer
- Years worth of studies have shown IT alone does not provide advantage
  - Not a new phenomenon
- Rebuttal letters largely fall into same trap
  - Necessary versus differentiating?
  - Sector specifics?
  - Relationship to productivity factors?
Making Sense of IT Investment

- Two different roles for IT
  - Necessary for doing business
  - Enabling differentiation from competitors

- **Necessary IT** should be managed for reliability, security, cost
  - Similar to other required costs of business, *except* for rapid and constant change

- **Enabling IT** requires business strategy
  - What business innovation can provide competitive advantage, and for how long
Multiplier Effect of IT

- IT investments can yield positive, negligible or negative returns
  - Positive if enable creation of new value or increases in efficiency
  - Negligible if not used much (or not completed)
  - Negative if disruptive or decreases efficiency
Multiplier Often Not Positive

- IT that substantially changes business processes is high risk, high reward
  - Clear goals, strategy and good execution all important to positive outcome

- For necessary as well as enabling IT
  - Differs from most necessary costs of business (but only when large change in processes)

- Negligible and negative outcomes
  - Accounts for overall lack of return averaged across firms
Success Factors for Enabling IT

- Clear business strategy that derives key benefits from IT investment
  - Why positioned to innovate successfully and how important to business success
- Individuals who “bridge the gap” between business domain and IT capabilities
  - Minimize chance for errors in understanding needs and what is achievable
- Radical incrementalism
  - Frequent rollouts and constant feedback
Strategy and Competitive Advantage

- Importance of setting all IT investment in strategic context
  - IT investments are high risk/reward
    - If the response is to manage away from risk, should be justified strategically

- Competitive strategy directly relevant
  - How sustainable are IT enabled investments?
  - What is the firm’s level of leadership?
  - What are threats from new IT savvy entrants or new IT enabled substitutes

- Even if decision not to pursue enabling IT
Managing Necessary IT

- Necessary IT should
  - Reduce cost of operations
  - Match products/services of competitors

- Important to view in terms of total costs
  - System – should be capital for labor
  - IT support – should be labor effectiveness

- When fully automated IT is main cost

- Relate to Carr’s view of IT costs
  - Managing IT vs. electricity
  - Ability to correctly isolate costs
Importance of Being Incremental

- Can be important for necessary as well as enabling IT
  - Big bang projects more likely to fail
    - Business needs not understood
    - Technology capabilities not understood
    - Needs and capabilities constantly changing
  - No substitute for real system and real users

- Rules of thumb for roll-outs
  - Initial less than 9 months (actual, plan less)
  - Additional at least every 6 months until mature
Importance of Domain Knowledge

- Two equally important drivers
  - Business needs
  - Technological capabilities
- Need to mesh for success
- Challenge of different vocabularies
  - Bridging individuals
- Challenge of “third stakeholder”
  - Placing another organization between IT and business usually not advisable
  - Have bridging individuals in both IT and business organizations
Next Time

- Additional discussion of cases where IT enabled differentiation
  - Goal of understanding factors for opportunity and sustainability
- Additional (optional background) reading on IT and productivity
  - Brynjolfsson article in Optimize
    - www.optimizemag.com/printer/021/pr_roi.html