

# E-commerce, Information Technology and Strategy: What Really Matters?

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Seminar Presentation, ISM 101, November 4, 2004

# IT Doesn't Matter

- Title of a piece by Nicholas Carr in *Harvard Business Review*, May 2003
- Some responses:
  - “...dangerously wrong...” – *Fortune*
  - “Hogwash!” – Steve Ballmer, CEO, Microsoft
  - “...dead wrong...” – Carly Fiorina, CEO Hewlett-Packard
- Counter-response:
  - *Does IT Matter? Information Technology and the Corrosion of Competitive Advantage*, HBS Press, 2004

# What is IT?

- “...all the technology, both hardware and software, used to store, process and transport information in digital form.”
- The meaning of “IT” does not encompass the information that flows through the technology or the talent of the people using the technology.”

# Outline of the Thesis

- IT is transforming from “a set of proprietary and heterogeneous systems into a shared and standardized infrastructure”
- This is “a natural, necessary, and healthy process”
- Only by becoming an infrastructure – a common resource can IT “deliver its greatest economic and social benefits”
- These developments are not supportive of IT as a basis for sustained competitive advantage
- In fact, standardized IT infrastructure corrodes traditional forms of competitive advantage

# Infrastructural Technologies

- Historical examples and analogies
  - Railroads
  - Electric Power
- Pioneers can gain lasting competitive advantages in early stages, but maturity brings easier and cheaper imitation
- Economic characteristics that matter:
  - Shareability
  - High fixed costs
  - Network effects
- What about pre-digital telecommunications?
  - Regulation preserved “natural” monopoly

# Commoditization: Hardware

- Need for shareability and interoperability forces standardization
- Michael Dell:
  - “In the long run all technology tends toward low-cost standards”
- Sequence of commoditization in hardware: PCs, servers, storage, networking
- Who’s threatened?
  - Sun, EMC, Cisco
- Dell embraced commoditization

# Commoditization: Software

- New York Times writer Steve Lohr:
  - “Software is the embodiment of human intelligence”
- Huge economies of scale in software production
- Evolution from custom applications to packaged products, i.e., commoditization
- Even complex software such as ERP systems (e.g., SAP, Oracle, PeopleSoft) is not differentiated at level of functionality
- Overshooting features (e.g., MS Office, database software) makes room for low-end commodity software (including open source)
- Software development becoming automated and software is more modularized

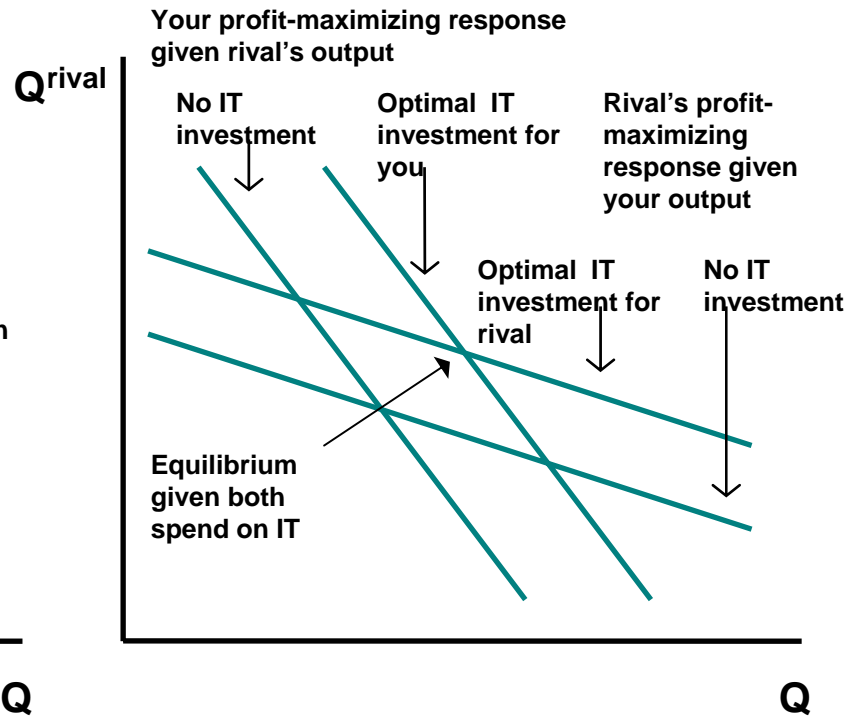
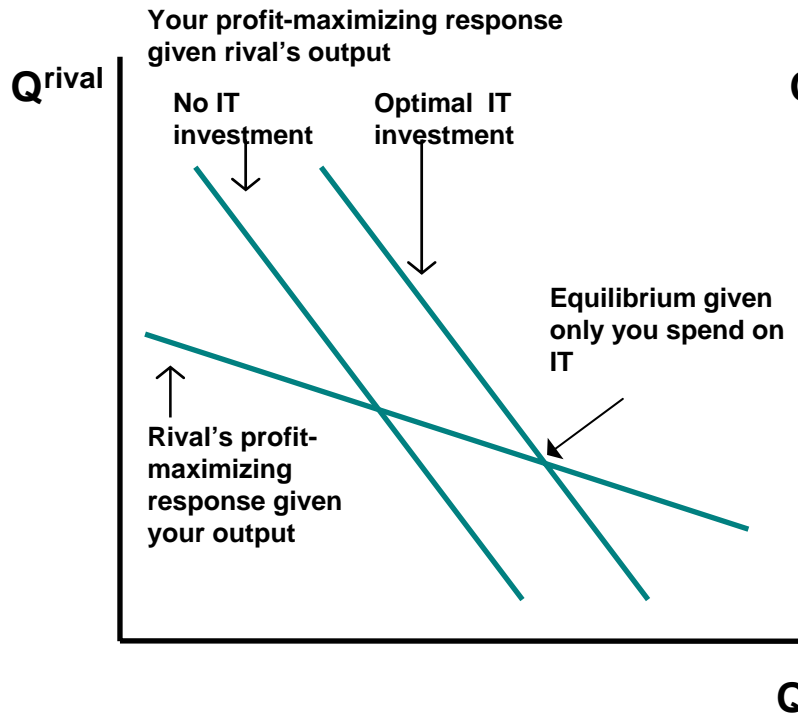
# Commoditization: Systems Architecture

- Most architectural advances now emerge from vendors who have incentives to promote adoption through standardization
- Wi-Fi becoming commoditized rapidly
- Web services
  - A set of software standards and applications that enable diverse IT systems to communicate over the Internet
  - Enable distribution of software applications as “services” over the Internet

# Bottom Line Effects

- Evidence that IT investment increases productivity
- But this doesn't translate into superior profitability
- Because IT investments can be imitated
- This is not true when the technology is new
  - Examples: Sabre, American Hospital Supply, Reuters, IBM
- How long does it last?
  - 10 years
  - More if combined with other bases for competitive advantage
  - But innovation (and commoditization) happening more quickly

# IT Wars (Cost Reduction)



- Both might be better off with less IT investment
- Same story can apply to other expenditures
- Same flavor as Prisoner's Dilemma – have to do it whatever rival does, but no advantage since rival also does it

# Eroding Advantage

- IT infrastructure is mature and standardized
- Enables the homogenization of business processes
- So not only is IT not a source of competitive advantage, but it erodes traditional advantages elsewhere
  - Brings in new competitors
  - Levels the playing field
  - Increases information for competitors, buyers and suppliers

# Intelligent Strategy

- Wal-Mart
  - IT for logistics just one element, and the one that could be copied
  - Also location, marketing, product selection, pricing
  - “...a complex, tightly integrated, and difficult-to-copy combination of processes and activities”
- Dell
  - Build-to-order approach was key
  - Predated IT use for web orders and customization
  - “IT has buttressed Dell’s advantage, but it is by no means the source of that advantage”
- Apple
  - Design
  - Tight integration between hardware and software
  - Strong brand
  - Product innovation

# Sources of Advantage

- Intellectual property
- Brand
- Process expertise (learning-by-doing)
- Combinations of assets (talent, knowledge, location, equipment,...)
- Speed
- Customer relationships
- *Where and how does IT matter?*

# What are the critical business problems?

- Security and privacy
- Reliability
- Understanding customers
- Managing global supply chains
- Managing innovation
- *Where and how does IT matter?*

# Where is IT not mature?

- Frontier software
  - Intelligent sifting and sorting of information
  - Enabling rich collaboration
  - Sophisticated analysis and prediction
  - Managing customer relationships
  - Providing expert judgments
- Frontier hardware
  - Nanotechnology
  - Chips that support frontier software
  - Opto-electronics
  - Bio-electronics

# Generic Strategy Approaches

- Low-cost leadership
- Differentiation
- Does IT reduce or increase possibilities for low-cost leadership?
  - Maybe either, depending on tradeoff between scale and scope
  - Can reinforce economies of scale, especially network economies
  - Or can reduce fixed costs and allow lower scale entry with focus on narrow niches
- Does IT reduce or increase possibilities for differentiation?
  - Maybe either, depending on situation
  - Can allow for narrow niches to break even more easily
  - And can make imitation and even brand-building easier

# Dimensions of Strategy

- Technology
  - IT systems
  - Mechanical processes
  - Chemical processes
  - Biological processes
- Law
  - Traditional property rights
  - Intellectual property rights
- Economics
  - Finance
  - Costing and resource allocation
  - Product development and operations
  - Demand analysis and pricing
  - Organizational incentives
  - Investment decisions

# E-commerce and IT

- Amazon
- Yahoo
- eBay
- Google
- IBM
- Apple
- Microsoft
- Time Warner (AOL)
- Dell

# Amazon

- IT investments in web ordering systems critical
- Physical fulfillment a challenge
- IT important for building a 'buying portal'/virtual mall
- Branding and first-mover advantage
- Not IT alone, but quality of software matters
- Attempts to defend intellectual property against imitators – 'one-click' patent

# Yahoo

- Started out as a ‘pure’ technology company – search engine – as opposed to
- Created the idea of a ‘portal’
- Content is being organized and partly ‘pushed’ to users
- Range of services provided (especially email)
- Now a more a media company
- Branding and first-mover advantage
- Not IT alone, but quality of software matters

# eBay

- Quality of IT is critical – no issues of physical fulfillment
- More complex software than for content or for product ordering
- Defended its network against auction crawlers
- Network externalities critical – Amazon and Yahoo couldn't make significant inroads
- Branding and first-mover advantage
- Managing payment presents new challenges – not yet cookie-cutter software

# Google

- Most heavily an IT company
- Competitive advantage has been based solely on quality of search software
- Intellectual property the key against imitation
- Brand building came slowly
- Not a first mover
- Continued success likely to depend on being at frontier of intelligent software for various kinds of search

# IBM

- Always an IT services company for business customers
- Historically, proprietary hardware and software, but bundled IT services contracts protected and enhanced the value (there were competing mainframe companies, but also-rans)
- As hardware and software have become commoditized, emphasis more explicitly on IT services
- As IT architectures become more standardized, customized services have to focus more on creating business value
- All 'system integrators' are facing this challenge in providing consulting services
- Understanding of what IT can and cannot do still a benefit
- Does producing and selling hardware and software help IBM teach other firms?

# Apple

- Started out as classic IT systems firm
- Is now more a consumer electronics firm
- E-commerce enters through iTunes service
- Effectively bundled with iPod hardware
- IT matters less than content and branding
- IT necessary but not sufficient
- IT alone not a source of competitive advantage

# Microsoft

- Software firm that has moved from operating systems to applications to services (MSN, Hotmail) and consumer electronics (XBox)
- Source of competitive advantage has been network externalities and contracting methods
- Keeps trying to establish proprietary software at heart of Internet
- Meets with resistance
- Its own internal use of IT does not appear to be a significant factor in its success

# Time Warner (AOL)

- Shows that first mover advantage and installed base are not enough for sustained advantage
- Aggressive marketing can only go so far
- Did not use IT to create as much value as possible
- Could IT have provided more synergies between content (Time Warner) and delivery?

# Dell

- Dell's model pre-dates IT and Internet
- But IT was critical to continued growth
- Why couldn't others (Gateway, HP, Compaq) copy success with similar IT investments?
- Lack of strategic focus
- So IT necessary but not sufficient



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# Conclusion

- Carr excludes information and people from his discussion of IT
- But more than ever, IT is about information (managing it intelligently) and people (getting the best from them collectively and providing customized services)
- IT is also being used at the frontiers of other technologies (based on biology, physics, chemistry) – the science and technology content of products and services will keep increasing

# Conclusion

- Technology and innovation have always mattered for competitive advantage, since the industrial revolution
- But economic and legal approaches, and clear, comprehensive strategic direction have always mattered
- The 1980s and 1990s IT boom was just a narrow example of larger forces that are still at work