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

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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:
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

Dell Annual Revenues Since IPO (Billions)
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.”
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.