IT Infrastructure and Emerging Technologies: Amazon and Cloud Computing (Chap. 5)

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Management Information Systems:
Managing the Digital Firm

1. Organization, Management, and the Networked Enterprise
2. Information Technology Infrastructure
3. Key System Applications for the Digital Age
4. Building and Managing Systems

Chap. 5
IT Infrastructure and Emerging Technologies: Amazon and Cloud Computing
Case Study: Amazon and Cloud Computing (Chap. 5) (pp. 234-236)

Should Businesses Move to the Cloud?

1. What business benefits do cloud computing services provide? What problems do they solve?
2. What are the disadvantages of cloud computing?
3. How do the concepts of capacity planning, scalability, and TCO apply to this case? Apply these concepts both to Amazon and to subscribers of its services.
4. What kinds of businesses are most likely to benefit from using cloud computing? Why?

Overview of Fundamental MIS Concepts

Management

Organization

Technology

Business Challenges

Information System

Business Solutions

Business Model

1. Customer Segments
2. Value Proposition
3. Channels
4. Customer Relationships
5. Revenue Streams
6. Key Activities
7. Key Resources
8. Key Partners
9. Cost Structure

IT Infrastructure

• Set of physical devices and software required to operate enterprise
• Set of firmwide services including:
  – Computing platforms providing computing services
  – Telecommunications services
  – Data management services
  – Application software services
  – Physical facilities management services
  – IT management, standards, education, research and development services
• “Service platform” perspective more accurate view of value of investments

CONNECTION BETWEEN THE FIRM, IT INFRASTRUCTURE, AND BUSINESS CAPABILITIES

STAGES IN IT INFRASTRUCTURE EVOLUTION

Mainframe/Minicomputer (1959–present)

Personal Computer (1981–present)

Client/Server (1983–present)

STAGES IN IT INFRASTRUCTURE EVOLUTION

A MULTITIERED CLIENT/SERVER NETWORK (N-TIER)

MOORE’S LAW AND MICROPROCESSOR PERFORMANCE

Moore’s Law Means More Performance

FALLING COST OF CHIPS

Moore's Law Means Decreasing Costs

Transistor Price in U.S. Dollars

Ten
One Tenth
One Hundredth
One Thousandth
One Ten Thousandth
One Hundred Thousandth
One Millionth
One Ten Millionth

Packing more transistors into less space has driven dramatic reductions in their cost and in the cost of the products they populate.

EXAMPLES OF NANOTUBES
THE COST OF STORING DATA DECLINES EXPONENTIALLY 1950–2012

EXPONENTIAL DECLINES IN INTERNET COMMUNICATIONS COSTS

IT Infrastructure has seven main components

1. Computer hardware platforms
2. Operating system platforms
3. Enterprise software applications
4. Data management and storage
5. Networking/telecommunications platforms
6. Internet platforms
7. Consulting system integration services

THE IT INFRASTRUCTURE ECOSYSTEM

Data Management and Storage
- IBM DB2
- Oracle
- SQL Server
- Sybase
- MySQL
- EMC
- Apache
- Hadoop

Internet Platforms
- Apache
- Microsoft IIS, .NET
- Unix
- Cisco
- Java

Computer Hardware Platforms
- Dell
- IBM
- Sun
- HP
- Apple
- Linux machines

Operating Systems Platforms
- Microsoft Windows
- Unix
- Linux
- Mac OS X
- Chrome
- Android
- iOS

Networking/Telecommunications
- Microsoft Windows Server
- Linux
- Novell
- Cisco
- Alcatel-Lucent
- Nortel
- AT&T, Verizon

Enterprise Software Applications
(including middleware)
- SAP
- Oracle
- Microsoft
- IBM

Contemporary Hardware Platform Trends

• The Mobile Digital Platform
• Consumerization of IT and BYOD
• Grid computing
• Virtualization
• Cloud Computing
• Green Computing
• High-Performance and Power-Saving Processors
• Autonomic Computing

Cloud computing

• On-demand (utility) computing services obtained over network
  – Infrastructure as a service (IaaS)
  – Platform as a service (PaaS)
  – Software as a service (SaaS)

• Cloud can be public or private

• Allows companies to minimize IT investments

• Drawbacks: Concerns of security, reliability

• Hybrid cloud computing model

Contemporary Software Platform Trends

• Open Source Software
• Linux
• Software for the Web
  – Java
  – HTML and HTML5
• Web Services
• Service-Oriented Architecture (SOA)
• Software Outsourcing
• Cloud Services

CHANGING SOURCES OF FIRM SOFTWARE

Software outsourcing and cloud services

• Three external sources for software:
  1. Software packages and enterprise software
  2. Software outsourcing
     • Contracting outside firms to develop software
  3. Cloud-based software services
     • Software as a service (SaaS)
     • Accessed with Web browser over Internet
     • Service Level Agreements (SLAs): formal agreement with service providers

Software outsourcing and cloud services

• Mashups
  – Combinations of two or more online applications, such as combining mapping software (Google Maps) with local content

• Apps
  – Small pieces of software that run on the Internet, on your computer, or on your cell phone
    • iPhone, Android
  – Generally delivered over the Internet

Management Issues

• Dealing with platform and infrastructure change
  – As firms shrink or grow, IT needs to be flexible and scalable
  – Scalability:
    • Ability to expand to serve larger numbers of users
  – For mobile computing and cloud computing
    • New policies and procedures for managing these new platforms
    • Contractual agreements with firms running clouds and distributing software required

Management Issues

• Management and governance
  – Who controls IT infrastructure?
  – How should IT department be organized?
    • Centralized
      – Central IT department makes decisions
    • Decentralized
      – Business unit IT departments make own decisions
  – How are costs allocated between divisions, departments?

Management Issues

• Making wise infrastructure investments
  – Amount to spend on IT is complex question
    • Rent vs. buy, outsourcing
  – Total cost of ownership (TCO) model
    • Analyzes direct and indirect costs
    • Hardware, software account for only about 20% of TCO
    • Other costs: Installation, training, support, maintenance, infrastructure, downtime, space and energy
    • TCO can be reduced through use of cloud services, greater centralization and standardization of hardware and software resources

COMPETITIVE FORCES MODEL FOR IT INFRASTRUCTURE

1. Market Demand for Your Firm's Customer Services, Supplier Services, and Enterprise Services
2. Your Firm's Business Strategy
3. Your Firm's IT Strategy, Infrastructure, and Cost
4. Information Technology
5. Competitor Firms' IT Services
6. Competitor Firms' IT Infrastructure Investments

Competitive forces model for IT infrastructure investment

1. Market demand for firm’s services
2. Firm’s business strategy
3. Firm’s IT strategy, infrastructure, and cost
4. Information technology assessment
5. Competitor firm services
6. Competitor firm IT infrastructure investments

Interactive Session: Technology: Big Data, Big Rewards

1. Describe the kinds of “big data” collected by the organizations described in this case.

2. List and describe the business intelligence technologies described in this case.

3. Why did the companies described in this case need to maintain and analyze big data? What business benefits did they obtain?

4. Identify three decisions that were improved by using “big data.”

5. What kinds of organizations are most likely to need “big data” management and analytical tools? Why?
資訊管理專題
(Hot Issues of Information Management)

1. 請同學於資訊管理專題個案討論前應詳細研讀個案，並思考個案研究問題。

2. 請同學於上課前複習相關資訊管理相關理論，以作為個案分析及擬定管理對策的依據。

3. 請同學於上課前先繳交資訊管理專題個案研究問題書面報告。

4. 上課時間地點：
   週二 3,4 (10:10-12:00) B507
References


– Kenneth C. Laudon & Jane P. Laudon原著，游張松 主編，陳文生 翻譯 (2014)，資訊管理系統，第13版，滄海