Competitive Advantage with Information Systems

Reading:
Laudon & Laudon
chapter 3

Additional Reading:
Brien & Marakas
chapter 2
Outline

- Competitive Advantage with Information Systems
  - Porter’s Competitive Forces Model
  - Strategies for Dealing with Competitive Forces
  - Strategic Use of Information Technology
  - The Value Chain and Strategic IS

- Competing on Global Scale

- Competing on Quality and Design
  - What is Quality
  - How IS improve Quality

- Competing on Business Process
Apple’s iTunes: Music’s New Gatekeeper

➤ Problem

*Taking advantage of opportunities from new and disruptive technology, staying ahead of traditional competitors*

➤ Solution

- Launches iPod and set up iTunes Music Store
  - *Create a marketplace for portable, downloadable music*
- Partnerships with artists and recording labels
  - *allow iTunes to supply exclusive content in return for driving sales and increasing groups’ popularity*
- Illustrates digital technology’s role in gaining and maintaining a competitive advantage
Apple’s iTunes: Music’s New Gatekeeper

- Design business strategy
- Design new products and services

- Transform music sales and distribution process
- Collaborate with music labels
- Build online storefront and digital services for music delivery
- Create new digital platforms or storing and playing music

- Opportunities from new technology
- Slowing growth

- Sell on the Web
- Manage music with new digital entertainment products

- Increase sales
Strategic Information Systems

- Information Technology
  - No longer an afterthought in forming business strategy, but the **actual cause and driver**
  - Can change the way business compete

- Strategic Information System
  - Any kind of information system
  - That uses IT to help an organization
    - Gain a competitive advantage
    - Reduce a competitive disadvantage
    - Or meet other strategic enterprise objectives
Porter’s Competitive Forces Model

Five Competitive Forces Shape of Firm

- New market entrants
- Substitute products
- Suppliers
- Customers
Porter’s Competitive Forces Model

Five Competitive Forces Shape of Firm

- **Traditional competitors**
  - Competitors in market space continuously devise new products, new efficiencies, switching costs on customers

- **New market entrants**
  - Some industries have low barriers to entry
    - Example → food industry Vs microchip industry
  - Newer companies may have advantages
    - Newer equipment, younger workforce → less expensive, more innovative, etc.
Porter’s Competitive Forces Model

- **Substitute products and services**
  - Substitutes customers can purchase if your prices too high
  - Example → Internet music service Vs CDs

- **Customers**
  - Ability to attract and retain customers
  - Can customers easily switch to competitor’s products?
  - Can customers force firm and competitors to compete on price alone (transparent marketplace)

- **Suppliers**
  - The more suppliers a firm has, the greater control it can exercise over suppliers
Five Competitive Strategies

➢ Cost Leadership
  ■ Become low-cost producers
  ■ Help suppliers or customers reduce costs
  ■ Increase cost to competitors
  ■ Examples
    ✷ Wal-Mart → Replenishes inventory with lightening speed, not need money to maintain inventory
    ✷ eBay.com → Online auctions, Auction-set prices

➢ Differentiation Strategy
  ■ Develop ways to differentiate a firm’s products from its competitors
  ■ Can focus on particular segment or niche of market
  ■ Examples
    ✷ Dell Computer → Online customer design, Increase in market share
    ✷ Moen Inc. → Online customer design, Increase in market share
Five Competitive Strategies

- Differentiation Strategy

On the Dell Inc. Web site, customers can select the options they want and order their computer custom built to these specifications. Dell’s assemble-to-order system is a major source of competitive advantage.
Five Competitive Strategies

➤ **Innovation Strategy**

- Find new ways of doing business
  - Unique products or services
  - Or unique markets
  - Radical changes to business processes to alter the fundamental structure of an industry
- Example → Amazon uses online full-service customer systems

➤ **Growth Strategy**

- Expand company’s capacity to produce goods and services
- Expand into global markets
- Diversify into new products or services
- Examples
  - Wal-Mart → uses merchandise ordering by global satellite tracking
  - Citicorp → uses global intranet, increase in global market
Five Competitive Strategies

- **Alliance Strategy**
  - Establish linkages and alliances with
    - Customers, suppliers, competitors, consultants and other companies
  - Includes mergers, acquisitions, joint ventures, virtual companies
  - Examples
    - Procter & Gamble → automatic inventory, reduced inventory
    - Cisco Systems → Virtual manufacturing alliances, market leadership

*Using These Strategies*

- The strategies are not mutually exclusive
- Organizations use one, some or all
## Five Competitive Strategies

- **Using IT for These Strategies**

### Basic Strategies in the Business Use of Information Technology

<table>
<thead>
<tr>
<th>Lower Costs</th>
<th>Differentiate</th>
<th>Innovate</th>
<th>Promote Growth</th>
<th>Develop Alliances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use IT to substantially reduce the cost of business processes.</td>
<td>Develop new IT features to differentiate products and services.</td>
<td>Create new products and services that include IT components.</td>
<td>Use IT to manage regional and global business expansion.</td>
<td>Use IT to create virtual organizations of business partners.</td>
</tr>
<tr>
<td>Use IT to lower the costs of customers or suppliers.</td>
<td>Use IT features to reduce the differentiation advantages of competitors.</td>
<td>Develop unique new markets or market niches with the help of IT.</td>
<td>Use IT to diversify and integrate into other products and services.</td>
<td>Develop interenterprise information systems linked by the Internet and extranets that support strategic business relationships with customers, suppliers, subcontractors, and others.</td>
</tr>
</tbody>
</table>
Competitive Advantages

- Internet’s Impact on Competitive Advantage
  - Existing competitors
    - Widens market, increasing competitors, reducing differences, pressure to compete on price
  - New entrants
    - Reduces barriers to entry (e.g. need for sales force declines), provides technology for driving business processes
  - Substitute products and services
    - Facilitates creation of new products and services
  - Customers’ bargaining power
    - Bargaining power shifts to customer
  - Suppliers’ bargaining power
    - Procurement over Internet raises power over suppliers, suppliers can benefit from reduced barriers to entry and elimination of intermediaries
The Business Value Chain Model

➢ Porter Model
  ■ Not very specific
    ✦ What exactly to do?
  ■ No exact methodology for competitive advantage

➢ Value Chain Model
  ■ Highlights specific activities in the business
    ✦ Competitive strategies can be best applied
    ✦ IT Systems are most likely to have impact
  ■ Primary Activities
  ■ Support activities
  ■ Benchmarking
    ✦ Comparing efficiency of your b* process with strict standards
  ■ Best practices
    ✦ Identified by Government or research organizations → most successful solution for achieving business objective
The Business Value Chain Model

**Firm Value Chain**

- Administration and Management: Electronic scheduling and messaging systems
- Human Resources: Workforce planning systems
- Technology: Computer-aided design systems
- Procurement: Computerized purchasing systems

**Inbound Logistics**
- Automated warehousing systems

**Operations**
- Computer-controlled machining systems

**Sales and Marketing**
- Computerized ordering systems

**Service**
- Equipment maintenance systems

**Outbound Logistics**
- Automated shipment scheduling systems

**Support Activities**

**Primary Activities**

**Sourcing and Procurement Systems**

**Suppliers’ Suppliers**

**Suppliers**

**Firm**

**Distributors**

**Customers**

**Industry Value Chain**

Customer Relationship Management Systems
Business Process Reengineering

➢ BPR

- Fundamental rethinking and radical redesign of business processes to achieve improvements in **cost, quality, speed** and **service**
- Tasks are streamlined to eliminate repetitive and redundant work
- Potential payback high
- Risk of failure is also high
- Mortgage banks have been great beneficiaries of BPR, achieving remarkable leaps forward in efficiency

<table>
<thead>
<tr>
<th></th>
<th>Business Improvement</th>
<th>Business Process Reengineering</th>
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</thead>
<tbody>
<tr>
<td><strong>Level of Change</strong></td>
<td>Incremental</td>
<td>Radical</td>
</tr>
<tr>
<td><strong>Process Change</strong></td>
<td>Improved new version of process</td>
<td>Brand-new process</td>
</tr>
<tr>
<td><strong>Starting Point</strong></td>
<td>Existing processes</td>
<td>Clean slate</td>
</tr>
<tr>
<td><strong>Frequency of Change</strong></td>
<td>One-time or continuous</td>
<td>Periodic one-time change</td>
</tr>
<tr>
<td><strong>Time Required</strong></td>
<td>Short</td>
<td>Long</td>
</tr>
<tr>
<td><strong>Typical Scope</strong></td>
<td>Narrow, within functions</td>
<td>Broad, cross functional</td>
</tr>
<tr>
<td><strong>Horizon</strong></td>
<td>Past and present</td>
<td>Future</td>
</tr>
<tr>
<td><strong>Participation</strong></td>
<td>Bottom-up</td>
<td>Top-down</td>
</tr>
<tr>
<td><strong>Path to Execution</strong></td>
<td>Cultural</td>
<td>Cultural, structural</td>
</tr>
<tr>
<td><strong>Primary Enabler</strong></td>
<td>Statistical control</td>
<td>Information technology</td>
</tr>
<tr>
<td><strong>Risk</strong></td>
<td>Moderate</td>
<td>High</td>
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</table>
Business Process Reengineering

➢ Workflow Management
  ▪ Streamlines business procedures so documents can be moved easily and efficiently
  ▪ Automates processes
  ▪ Eliminates delays
  ▪ Allows simultaneous work

➢ Steps in Effective Reengineering
  ▪ Understanding what business processes need improvement
  ▪ Understanding how the improvements will help the firm execute its strategy
  ▪ Understanding and measuring the performance of existing processes as baselines
  ▪ Managing change
Business Process Reengineering

Redesigning Mortgage Processing (USA)

BEFORE REENGINEERING
Desk-to-desk approach

Origination of loan: paper application

- Prequalification
  - Loan limit estimates
  - Loan structuring options
  - Maximum monthly payment estimates

- Document generation
  - Application documents
  - Disclosure documents
  - Compliance documents
  - Credit analysis worksheets

- Application processing
  - Appraisal
  - Title search
  - Credit checking and scoring

- Credit analysis and underwriting
  - Closing calculations
  - Closing documents
  - Setup for servicing

- Approval and closing

Servicing of loan in multiple locations by specialists in credit analysis and underwriters
Business Process Reengineering

Redesigning Mortgage Processing (USA)

Servicing of loan in multiple locations by specialists in credit analysis and underwriters

Payment processing and reporting
- Payment accounting
- Statements
- Tax reporting

Escrow management
- Hazard insurance accounting
- Private mortgage insurance accounting
- Property tax accounting

Customer service
- Balance inquiries
- Escrow inquiries
- Statement requests

Collections, bankruptcies, and foreclosures
- Late-payment notices
- Management of delinquent accounts

Loan servicing by specialists in insurance and escrow

Value and risk
- Loan inventory
- Gain/loss calculations
- Risk management
- Loan purchase and sale management

Transfer to secondary market
- Loan pooling
- Loan shipment
By redesigning their mortgage processing systems and the mortgage application process, mortgage banks are able to reduce the costs of processing the average mortgage from $3,000 to $1,000 and reduce the time of approval from six weeks to one week or less. Some banks are even preapproving mortgages and locking interest rates on the same day the customer applies.
Virtual Company

- Virtual Company
- Usage of IT to Link
  - People
  - Organizations
  - Assets
  - And ideas
- Why Virtual Company?
  - To implement key business strategies and alliances for success in turbulent business climate
- Creates inter-enterprise information system
  - To link customers, suppliers, subcontractors, and competitors

<table>
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<tr>
<th>Strategies of Virtual Companies</th>
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<tbody>
<tr>
<td>• Share infrastructure and risk with alliance partners.</td>
</tr>
<tr>
<td>• Link complementary core competencies.</td>
</tr>
<tr>
<td>• Reduce concept-to-cash time through sharing.</td>
</tr>
<tr>
<td>• Increase facilities and market coverage.</td>
</tr>
<tr>
<td>• Gain access to new markets and share market or customer loyalty.</td>
</tr>
<tr>
<td>• Migrate from selling products to selling solutions.</td>
</tr>
</tbody>
</table>
Virtual Company

- Uses Internet, Intranets, and Extranets to form virtual workgroup and support alliances with business partners

Example → Li & Fung (HK)

- Manages Production and Shipment of Garment
- Customers → Fashion Companies (GUESS, Ann Taylor, Reebok, etc.)
- Product Development, Raw Material Sourcing, Production, Planning, Quality Assurance, Shipping
- Does not own any fabric, factories, or machines
- Outsourcing → Network of more than 7500 supplies in 37 countries
- Customers → Private Extranet, Li & Fung → Raw Material Supplies and Factories, Extranet tracks entire production process
- Flexible and adaptable, Produces in short order, changing fashion trends
## Disruptive Technologies

- **Disruptive Technologies**
  - Technologies with disruptive impact on industries and businesses, rendering existing products, services and business models obsolete

- **Examples**

<table>
<thead>
<tr>
<th>Technology</th>
<th>Description</th>
<th>Winners and Losers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transistor (1947)</td>
<td>Low power, compact, semiconductor switch that destroyed the vacuum tube industry</td>
<td>Transistor manufacturing firms win (Texas Instruments), while vacuum tube manufacturers decline (RCA, Sylvania)</td>
</tr>
<tr>
<td>Microprocessor chips (1971)</td>
<td>Thousands and eventually millions of transistors on a silicon chip</td>
<td>Microprocessor firms win (Intel, Texas Instruments), while transistor firms (GE) decline</td>
</tr>
<tr>
<td>Personal computers (1975)</td>
<td>Small, inexpensive, but fully functional desktop computers</td>
<td>PC manufacturers (HP, Apple, IBM) and chip manufacturers (Intel) prosper, while mainframe (IBM) and minicomputer (DEC) firms lose</td>
</tr>
<tr>
<td>PC word processing software (1979)</td>
<td>Inexpensive, limited but functional text editing and formatting for personal computers</td>
<td>PC and software manufacturers (Microsoft, HP, Apple) prosper, while the typewriter industry disappears</td>
</tr>
<tr>
<td>World Wide Web (1989)</td>
<td>A global database of digital files and &quot;pages&quot; instantly available</td>
<td>Owners of online content and news benefit, while traditional publishers (newspapers, magazines, and broadcast television) lose</td>
</tr>
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Disruptive Technologies

뇌 First Movers Vs Fast Followers

- First movers of disruptive technologies may fail to see potential, allowing second movers to reap rewards (fast followers)

<table>
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<tr>
<th>Internet music (1998) services</th>
<th>Repositories of downloadable music on the Web with acceptable fidelity</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Owners of online music collections (MP3.com, iTunes), telecommunications providers who own Internet backbone (ATT, Verizon), and local Internet service providers win, while record label firms and music retailers lose (Tower Records)</td>
</tr>
<tr>
<td>PageRank algorithm</td>
<td>A method for ranking Web pages in terms of their popularity to supplement Web search by key terms</td>
</tr>
<tr>
<td></td>
<td>Google wins (it owns the patent), while traditional key word search engines (Alta Vista) lose</td>
</tr>
<tr>
<td>Online video search algorithms</td>
<td>Using a family of techniques from speech recognition to text classification in order to make large video collections easily searchable</td>
</tr>
<tr>
<td></td>
<td>Online video search companies (Blinkx) win, while traditional search engines at Yahoo!, Amazon, and even Google are challenged</td>
</tr>
<tr>
<td>Software as Web service</td>
<td>Using the Internet to provide remote access to online software</td>
</tr>
<tr>
<td></td>
<td>Online software services companies (Salesforce.com) win, while traditional &quot;boxed&quot; software companies (Microsoft, SAP, Oracle) lose</td>
</tr>
<tr>
<td>Online print services</td>
<td>Using the Internet to provide remote access to digital printers and online designers</td>
</tr>
<tr>
<td></td>
<td>Online print process firms gain (digitalpressonline.com), while traditional printers lose (RR Donnelley)</td>
</tr>
</tbody>
</table>
Competing on Global Scale

- Before Internet (Until Mid-90’s)
  - Only affordable by huge firms → GE, GM, IBM, etc.

- Internet → Drastically Reduces costs of operating globally

- Globalization Benefits
  - Scale economies and resource cost reduction
  - Higher utilization rates, fixed capital costs, and lower cost per unit of production
  - Speeding time to market

- Examples
  - Jeans or Sneakers with USA label? Most likely designed in California, Stitched together in HK or Guatemala using material from China or India
  - Calling for Microsoft or Verizon Help? Most likely you will be speaking to customer service representatives in India
Competing on Global Scale

➢ An HP Laptop’s Path to Market

- Idea, Laptop Design Team – USA, Approval – Houston
- Graphics Processors designed in Canada, Made in Taiwan
- Taiwan, South Korea – LCD Screens, Memory Chips,
- Japan, Singapore, USA – Other Components
- China – Assembly
Domestic Exporters
- Heavy centralization of corporate activities in home country

Multinationals
- Concentrates financial management at central home base while decentralizing production, sales, and marketing to other countries

Franchisers
- Product created, designed, financed, and initially produced in home country but rely on foreign units for further production, marketing, and human resources

Transnational
- Regional (not national) headquarters and perhaps world headquarters; optimizing resources as needed

International Business Organization
Competing on Quality

- **What is Quality?**
  - **Producer’s Perspective**
    - Conformance to specifications and absence of variation from specs
  - **Customer’s Perspective**
    - Physical quality (reliability), quality of service, psychological quality
- **Total Quality Management (TCM)**
  - Developed in US (Deming, Juran), Popularized in Japan
  - Quality → Responsibility of all people and functions within organization
  - Relies on an information system → Supplies workers and management with the data necessary to improve products and drive down costs
- **Six Sigma**
  - Spot problems and correct them before they are too deeply embedded in the company’s processes
  - Longer a flaw is allowed to fester in the system → More problems
  - Identify defects early and eliminate → Efficient production at lower cost
  - Specific Measure of quality: 3.4 defects/million opportunities
  - Most Companies cannot achieve this level, Use as Goal to Implement/Improve
How Information Systems Improve Quality?

- Reduce cycle time (provide info) and simplify production process
- Benchmarking → Identify Benchmark targets
- Use customer demands to improve products and services
- Improve design quality and precision
- Computer-aided design (CAD) systems
- Improve production precision and tighten production tolerances