TIM 50 - Business Information Systems

Lecture 5

• Guest Instructor: Huascar Sanchez
  • (hsanchez@soe.ucsc.edu)
  • UC Santa Cruz
  • 10/12/2011

• Most slides - and the better part of most other slides - are by Professor John Musacchio

---

Announcements

- **Read**
  - Messerschmitt Ch 2.3 (38-50)
  - Messerschmitt Ch 3.1-3.3 (59-82)

- **News Folio 1 due Monday 10/17**
  - (for those of you not assigned a presentation)

- **Homework assignment 2 will be posted Monday 10/17**

- **Business Paper Proposal due Wednesday 10/19**
Announcements

Next Week’s Presentations:
- Monday 10/17:
  - ??, news story
  - ??, news story

Porter Competitive Model
(Identify the Industry and the Specific Market Being Evaluated)

Potential New Entrants

Bargaining Power of Suppliers

Intra-Industry Rivalry

Strategic Business Unit

Bargaining Power of Buyers

Substitute Products and Services
Basic Competitive Strategies

- Counter the competitive forces by implementing 5 basic competitive strategies:
  - Cost leadership
  - Differentiation
  - Innovation
  - Growth
  - Alliances
- How does IT support these strategies?

Strategic Uses of Information Technology

<table>
<thead>
<tr>
<th>Strategy</th>
<th>IT Role</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving Business Processes</td>
<td>Use IT to reduce costs of doing business</td>
<td>Enhance Efficiency</td>
</tr>
<tr>
<td>Promote Business Innovation</td>
<td>Use IT to create new products or services</td>
<td>Create New Business Opportunities</td>
</tr>
<tr>
<td>Locking in Customers and Suppliers</td>
<td>Use IT to improve quality Use IT to link business to customers and suppliers</td>
<td>Maintain Valuable Customers and Relationships</td>
</tr>
</tbody>
</table>
**Strategic Uses of Information Technology**

**Strategy**
- Raise Barriers to Entry
- Build a Strategic IT Platform
- Build a Strategic Information Base

**IT Role**
- Increase amount of investment or complexity of IT needed to compete
- Leverage investment in IS resources from operational uses to strategic uses
- Use IT to provide information to support firm's competitive strategy

**Outcome**
- Increase Market Share
- Create New Business Opportunities
- Enhance Organizational Collaboration

---

**Porter Model and Information Systems:**

1. **Build barriers** to prevent a company from **entering** an industry?
2. Build in costs that would make it difficult for a customer to **switch** to another supplier?
3. Change the basis for competition **within** the industry?
4. Change the balance of power **between** a company and its customers or suppliers?
5. Provide the basis for new **products and services**?
**Porter's Value Chain**

- *Porter's Competitive Model* deals with the a company's competitive environment.

- *Porter's Value Chain* tracks progress of a product through organization
  - Starts with idea in research
  - Finishes with delivery to customer.

---

**Generic Value Chain**
**Value Chain Purpose**

- A way of classifying a company's activities and how they help deliver value to customer.

- A framework for evaluating decisions like outsourcing, or deployment of IT.

**Things to Remember Regarding the Value Chain**

- The ultimate objective is value to customer.

- As a new product and/or services moves through the value chain, it is important to maximize value-add activities and minimize things that do not add value to customer.

- Functional departments must be sure to emphasize the ultimate goal of value to customer and not do things that seem to make them look good but contradicts the ultimate objective.
Simple Value Chain for Retail Industry

Partnering with Vendor → Buying → Managing Inventory → Distributing Inventory → Operating Stores → Marketing and Selling

Other terms in Chapter 2

- Agile Company
- Virtual Company
- Knowledge Management Systems
Agile Company

- Agility: the ability to prosper in rapidly changing environment
- Marshall’s customers motto: “Free - Perfect - Now”
  - Free: Lower the costs, adjust based on their perceived value, not cost to produce
  - Perfect: Defect-free products, Customization, Anticipation of future needs
  - Now: 24/7 accessibility to products/services, short delivery times, time-to-market

A Virtual Company

A form of organization that uses telecommunications networks and other IT to link the people, assets and ideas of a variety of business partners, no matter where they may be located, in order to exploit a business opportunity.
A Virtual Company Example

Virtual Company

• Positives
  • Can partner with others to share infrastructure and risk
  • Link complementary core competencies
  • Reduce concept-to-cash time through sharing
  • Expand market coverage, gain access to new markets and share market/customer loyalty

• Negatives?
  • Ability to perform the service at a sufficiently low cost to still gain a profit
  • Respond to the organization’s new needs for capabilities and flexibility
Other terms in Chapter 2

- **Explicit knowledge**
  - Data, documents, things that can be written down/ stored in computers

- **Tacit Knowledge**
  - That can not be written down
  - "How-to"
  - Example: How to ride a bicycle

- **Much of a company’s value is in its knowledge**
  - Patents, documents
  - Tacit knowledge in employees' heads ("trade secrets")

---

Knowledge Management

- **Knowledge-Creating Company**
  - Create new business knowledge
  - Disseminate knowledge throughout company -> products, services
  - Get employees share what they know and accumulate enterprise knowledge

- **Knowledge Management Systems**
  - Facilitate this dissemination
  - Often, like a search engine on a company intranet.

- **Aside: a knowledge management system might affect the negotiating power of employees?**
**Total Quality Management**

Quality from the customer’s viewpoint  
Meeting/exceeding the requirements/expectations of customers for a product/service

---

**Presentations**

- Angela Tsai (news article)
- (Frito Lay)
Frito Lay Case

Time to debate!

• Break into discussion groups of 3-4 people
  □ Position 1: The HHC is a great project
  □ Position 2: The HHC is a bad project

• Take 10 minutes to write down your main arguments
• You must try to convince the other side

• After debating, each student should hand in a small summary of their teams’ argument line
  □ Hand in summary with your name on
  □ Extra participation credit!
Break into discussion groups of 3 or 4

- **Position 1: The HHC is a great project**
  - **It will:**
    - reduce burden on sales force.
    - replace optical scanner system that we need to replace soon anyway.
    - Give us lots of good data for more effective marketing.

- **Position 2: The HHC is a bad project**
  - It costs $40 million or more (almost 10% of our annual profits!)
  - There is no solid proof that it will increase revenue or reduce costs enough to justify the investment.
  - It might not work properly, wasting the sales force’s time.
  - It is a distraction from our true mission - selling salty snacks!

---

**Frito Lay**

- **Market: Salty Snacks**

- **Competitors:**
  - P & G (Pringles)
  - Anheuser Busch (Eagle Snacks)
  - Borden (Wise Chips)
  - Small Regionals

- **Sales Force**
  - 10,000 people
  - Drive around in trucks; sell and deliver snacks
The “Store-Door Delivery System”

• Strategy: Support your salespeople AND value your customers

• HOW?
  - Service point of sale twice/week
  - Restocked shelves
  - Removed stale products
  - Introduced new products/promotions to customers
  - Lined up new accounts
  - Initially: “national patterns” for product arrangement
  - Happy salespeople 😊

Frito Lay

- Growth
  - In the 70s, “double digit”
  - Mid 80s - slowed to single digit.
  - Foreign Expansion?
    - Not for Frito-Lay division, because PepsiCo has a separate international snacks div.

- Good:
  - Several top brands

- Bad
  - Monolithic national approach
1985 - Two Goals

- **Two Goals**
  1. Sustain at least 6% real sales growth
  2. Double-digit profit growth

- **Key strategies:**
  1. Build share & volume in the 7 brands. Move from 'national' to 'regional'.
  2. Effectiveness of new products, increase # of products and lower time to markets
  3. Improve productivity: technical limits of the delivery system

---

**Frito-Lay**

- **Segmentation**
  - Supermarket merchandiser, account managers
  - “up/down street” (route drivers)

- **Regionalized Micro-Marketing**
  - Targeted smaller brands to regional customers

- **Hand Held Computer**
  - Small computer for each salesperson to carry around
  - Log sale transaction data.
A day in the life of a salesperson (before HHC)... Sales + Account

5 a.m. (Warehouse)
- Load truck with ordered products
- Fill out consignment order form

6 a.m. (Customer site)
- Remove stales/Replenish shelves
- Fill out sales ticket
- Calculate total order price (promotions, stales, new products)

4 p.m. (Warehouse)
- Turn in sales tickets. Fill "end-of-day" report
- Paperwork sent for scanning

6 p.m. (Home)
- Review sales ticket. Confirm calculations

A day in the life of a salesperson (before HHC)... Sales + Account

5 a.m. (Warehouse)
- Load truck with ordered products
- Fill out consignment order form

6 a.m. (Customer site)
- Remove stales/Replenish shelves
- Fill out sales ticket
- Calculate total order price (promotions, stales, new products)

4 p.m. (Warehouse)
- Turn in sales tickets. Fill "end-of-day" report
- Paperwork sent for scanning

6 p.m. (Home)
- Review sales ticket. Confirm calculations
A day in the life of a salesperson (after HHC)...Sales!!!

5 a.m. (Warehouse)
- Load truck with ordered products
- Update HHC with consignment / price changes etc.

6 a.m. (Customer site)
- Remove stale / Replenish shelves
- Enter data in HHC.
- Confirm order in HHC. Print sales ticket

4 p.m. (Warehouse)
- Upload data from HHC to corporate computer

6 p.m. (Home)

Frito Lay

- HHC was a $40+ million project
- What were risks?
- How did they mitigate risks?
- Risk Mgmt
  - Pilot test of technology
  - 3 layer rollout
    - 1) essential systems
    - 2) sales compensation
    - 3) strategic uses of new data (fuzzy)
Frito-Lay

- **3 stated objectives**
  - Replace optical scanner system used now
    - IBM will stop supporting it soon
  - Salesperson
    - \( \frac{1}{2} \) hour per day per driver paper-work reduction
    - No accounting errors
  - **Marketing effectiveness (micro-marketing)**
    - Detailed sales data
      - will help make regional marketing decisions
      - Negotiate with stores for more shelf space

Implementation

- **Action plan**
  - Region by region?
  - All at once?
  - “Flagship” approach? Weakest first (less potential downside) or strongest region (greatest potential upside) first?
Frito Lay

- HHC deployed to LA area first, a region that won a sales award.
  - By the end of the 80’s
    - HHC deployment completed
    - Development of Information Systems to process HHC data to support operations.
  - Early 90’s re-org to decentralize decision making to different regions
- 1985
  - Revenue: $2847
  - Profit $401
- 2004
  - Revenue: $9091
  - Profit $2366
  - Revenue growth ~ 6% per year on average

Cash Flows

- **Cash Flow**: A series of payments/receipts over a time period

  ![Cash Flow Diagram](image)

- **Visualize using timeline**
  - Current year: 0
Net Present Value

- **NPV**: A quantity of money which, if received today, would be equally desirable as the cash flow.
- **NPV of $x received in year $n = x\delta^n**
- **A cash flow may have payments/receipts in multiple years**
  - Compute NPV for each year and add them.

\[
\begin{align*}
\text{NPV} &= -3 + \delta + \delta^2 + 2\delta^3 \\
&= x_0 + \delta x_1 + \delta^2 x_2 + \delta^3 x_3 + \ldots = \sum_{j=0}^{\infty} \delta^j x_j
\end{align*}
\]

Interest Rate

- The discount factor might be based on the interest rate $i$ that could be received if investing in bank/other project.
- $\delta = 1 / (1+i)$

\[
\begin{align*}
\text{NPV} &= x_0 + \delta x_1 + \delta^2 x_2 + \delta^3 x_3 + \ldots = \sum_{j=0}^{\infty} \delta^j x_j \\
&= x_0 + (1+i)^{-1} x_1 + (1+i)^{-2} x_2 + (1+i)^{-3} x_3 + \ldots = \sum_{j=0}^{\infty} (1+i)^{-j} x_j
\end{align*}
\]
Rate of Return (ROR)

- Also known as Return on Investment (ROI)
- Is the ratio of money gained/lost in an investment relative to the amount invested
- Computing ROR is the inverse problem to computing NPV
  - “What would the interest rate at the bank have to be in order for me to be neutral about investing in my project?”
  - The ROR equals the interest rate for which NPV = 0
  - Use this equation (NPV = 0) to find the ROR

Cash Flows

- Be able to compute:
  - NPV given the discount factor
  - NPV given the interest rate
  - Interest rate/Discount factor/ROR in order to have NPV = 0
  - Compare different investment plans based on their ROR/ROI
  - Evaluate whether it is worth investing on a plan given a desirable ROR
- Know how to solve simple quadratic equations!!!
  - Use of quadratic formula
• Net Present Value when $i = 0\%$

$$NPV = \sum_{j=0}^{\infty} x_j (1 + i)^{-j}$$

$$= -0.5 + 0.30 \cdot (1 + 0)^{-1} + 0.35 \cdot (1 + 0)^{-2}$$

$$= -0.5 + 0.30 + 0.35 = 0.15$$

• Net Present Value when $i = 10\%$

$$NPV = \sum_{j=0}^{\infty} x_j (1 + i)^{-j}$$

$$= -0.5 + 0.30 \cdot (1 + 0.1)^{-1} + 0.35 \cdot (1 + 0.1)^{-2}$$

$$= -0.5 + 0.273 + 0.289 = 0.062$$

• Net Present Value when $i = 20\%$

$$NPV = \sum_{j=0}^{\infty} x_j (1 + i)^{-j}$$

$$= -0.5 + 0.30 \cdot (1 + 0.2)^{-1} + 0.35 \cdot (1 + 0.2)^{-2}$$

$$= -0.5 + 0.25 + 0.243 = -0.0069$$

• Idea of RoR analysis:

• What $i$ makes $NPV = 0$?

$$NPV = \sum_{j=0}^{\infty} x_j (1 + i)^{-j} = 0$$

$$= -0.5 + 0.30 \cdot (1 + i)^{-1} + 0.35 \cdot (1 + i)^{-2} = 0$$

$$= 0.35 \cdot (1 + i)^{-2} + 0.30 \cdot (1 + i)^{-1} - 0.5 = 0$$

Quadratic Formula:

$$ax^2 + bx + c = 0 \rightarrow x = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$$

$$x := (1 + i)^{-1}$$

$$(1 + i)^{-1} = \frac{-0.3 + \sqrt{0.3^2 - 4 \cdot 0.35 \cdot (-1)}}{2 \cdot 0.35}$$

$$(1+i)^{-1} = 0.8411 \text{ or } -1.69 \quad \therefore i = 0.188 \text{ or } -1.89$$