ISM 50 - Business Information Systems

Lecture 6

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UC Santa Cruz
1/20/2011

Most slides are by Professor John Musacchio

Outline

- Announcements
- Review: Frito Lay
- Cash Flow
- Student Presentation (news)
- Information Management
- Enterprise Applications

Announcements

- Folio 1 due today
  - (only those not assigned an oral presentation)
- Assignment 2 due Thursday
  - Hard-copy, in class
- Business Paper Proposal Due Tuesday!
  - Groups announced via email

Announcements

- Project proposals due in 5 days!!
  - 1-2 pages
  - Give a plan what you will do
  - Cite some references, and show that you have started your research!
  - See website for more details

http://www.soe.ucsc.edu/classes/ism050/Winter11/businesspaper.htm

Announcements

- Reading for next time
  - Cisco Case
- NEW: Discussion Topics will be posted on the forum
  - Alternative way to earn participation points!
Announcements

Student presentations:
- Jan-20
  - Miguel Angel Mancilla
  - Ivan Cheung (Dell)
- Jan-25
  - Scott William Compton
  - Monica J Wang (Cisco)

SEND ME THE SLIDES THE NIGHT BEFORE (till 9 p.m.)
- Failing to do so will make you lose points.

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.

Frito-Lay

3 stated objectives
- Replace optical scanner system used now
  - IBM will stop supporting it soon
- Salesperson
  - ½ 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

HHC Project pros & cons
- Replaced optical scanner system that IBM would stop supporting soon
- Saves sales force time: 2.5 hours per week per driver
- Detailed sales data supports:
  - Regionalized marketing
  - Negotiations for shelf space with supermarkets
  - Reduce errors
- Expensive (~50 million)
- Risky
- Might not work technically
- Sales force might not like it (already upset about segmentation)
- Equipment vendor might not be reliable

Cash Flows

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

<table>
<thead>
<tr>
<th>Year</th>
<th>$1</th>
<th>$1</th>
<th>$2</th>
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<tr>
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<td>1</td>
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<tr>
<td>3</td>
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</table>

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

\[
NPV = -3 + 5 \delta + 2 \delta^2 + \sum_{j=3}^{n} \delta^j x_j
\]
**Interest Rate**

The discount factor might be based on the interest rate $i$ that could be received if investing in bank/other project.

$$\delta = \frac{1}{1+i}$$

$$\text{NPV} = x_0 + \delta x_1 + \delta^2 x_2 + \delta^3 x_3 + \ldots = \sum_{j=0}^{\infty} \delta^j x_j$$

**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 $\text{NPV} = 0$
- Use this equation ($\text{NPV} = 0$) to find the ROR.

**Cash Flows**

Be able to compute:

- $\text{NPV}$ given the discount factor
- $\text{NPV}$ given the interest rate
- Interest rate/Discount factor/ROR in order to have $\text{NPV} = 0$
- 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 $i = 0\%$**

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

- $0.5 \times (1.0)^{-1} + 0.35 \times (1.0)^{-2}$

**Net Present Value when $i = 10\%$**

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

- $0.5 \times (1.1)^{-1} + 0.35 \times (1.1)^{-2}$

**Net Present Value when $i = 20\%$**

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

- $0.5 \times (1.2)^{-1} + 0.35 \times (1.2)^{-2}$

**Idea of RoR analysis:**

What $i$ makes $\text{NPV} = 0$?

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

Quadratic Formula:

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

$$(1+i)^4 = 1.881$$ or $-1.69$

$x = 18.8$ or $x = 50$
What is Information?

- **Data**
  - Numbers, Character strings, etc.

- **Information**
  - Recognizable patterns of data organized so as to inform or influence the user in some way

- **Knowledge**
  - Concepts, relationships, truths, principles derived from information

- **Wisdom**
  - Insight or judgment acquired from extensive knowledge

Classify these

- "XV", "SF", 34, "CN", 16
- The 49-ers won Super Bowl XV by a score of 34 to 16.
- The National Football Conference wins 17 out of 20 Super Bowls on average.
- The best team usually wins.

Classify these

- 47, 560, 134
- My bank account has 47$ in it :-(
- My net worth, including my bank account and subtracting the debts is 560$
- At the rate my net worth is increasing, and given my age and expectations for retirement income, I can't retire until age 134...

Roles in information access

- User
- Author or publisher
- Indexer or organizer
- Librarian or teacher or interpreter
- Recommender

In the Networked Era...

- User
- Author or publisher
- Indexer or organizer
- Librarian
- Recommender

How are these roles being changed by networked computing?
Finding useful information...

- Search
  - Item search
  - Topic search
- Browse
  - Explore in order to find useful information
- Navigate
  - Follow directions/links to find information
  - In web: you do both!

Others can help....

- Author:
  - Hyperlink
    (Reference to related information)
- Author or third party:
  - Index
    (List of content)
  - Metadata
    (Description of content)
- Third party:
  - Reviews or recommendations
    (judgment of content)

Exercise

Give an example of the following functions in the context of movie rentals:

- Hyperlink
- Index
- Metadata
- Recommendation

Authors – Publishers

Creates information – verifies, makes available

Indexers

Classifies information

Indexers/Organizers – Librarians

(assists and guides user to needed info)
Librarians

Recommenders

Push vs. pull

User

Control over what is provided

Time when it is provided

Intermediate cases:

Notification

Subscription

Publisher

Question

What are some differences between push and pull with respect to:

- invasiveness on the user?
- refinement of the information received?
- timeliness with which information received?

Adapted from slides for Understanding Networked Applications by David G. Messerschmitt. Copyright 2000. See copyright notice.
Characteristics of information pull and push

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<thead>
<tr>
<th></th>
<th>Push</th>
<th>Pull</th>
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<tbody>
<tr>
<td>Control</td>
<td>User requests specific information</td>
<td>User subscribes to information on general</td>
</tr>
<tr>
<td>Notification</td>
<td>User submits question- publisher answers</td>
<td>Publisher provides useful notifications- user decides what to do</td>
</tr>
<tr>
<td>Timing</td>
<td>Information to user directed</td>
<td>Information provider directed</td>
</tr>
</tbody>
</table>

Proper roles of push and pull in a workgroup

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<thead>
<tr>
<th></th>
<th>Pull: work</th>
<th>Push: attention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Brainstorming</td>
<td>Notification of topic</td>
</tr>
<tr>
<td>Accessing documents</td>
<td>Notification of document availability</td>
<td>Reminder of deadlines</td>
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Newsgroups and Web                Email

Some modalities of information access

Enterprise Applications

Applications

- What is an application?
  - Computer software that performs useful capabilities for a user or organization
  - Incorporates storage, manipulation, and communication of information.

- An organizational application
  - Supports an organization

- Often called enterprise application
  - (An enterprise is an organization with a commercial mission)

Types of organizational applications

- Departmental
  - Supports a single functional department
  - Example: An accounts management application for an accounting department.

- Enterprise
  - Support enterprise-wide processes and goals.
  - Example: coordinate information between functional departments involved in fulfilling an order.
    (or other cross-functional process.)