ISM 50 - Business Information Systems

Lecture 6

Instructor: Katerina Potika
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
Instructor
- Katerina Potika (potika@soe.ucsc.edu)
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  - Office Hours: Wednesday, 10:00-noon in E2 314B
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
  - \(\frac{1}{2}\) 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
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

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

\[
\text{NPV} = -3 + \delta + \delta^2 + 2\delta^3
\]

\[
\text{NPV} = x_0 + \delta x_1 + \delta^2 x_2 + \delta^3 x_3 + ... = \sum_{j=0}^{\infty} \delta^j x_j
\]
Interest Rate

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

\[ \delta = 1 / (1+i) \]

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

\[
\text{NPV} = x_0 + (1+i)^{-1} x_1 + (1+i)^{-2} x_2 + (1+i)^{-3} x_3 + \ldots = \sum_{j=0}^{\infty} (1+i)^{-j} x_j
\]
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 $i = 0\%$

\[
\text{NPV} = \sum_{j=0}^{\infty} x_j (1 + i)^{-j} \\
= -0.5 + 0.30 \cdot (1 + 0)^{-1} + 0.35 \cdot (1 + 0)^{-2} \\
= -0.5 + 0.30 + 0.35 = 0.15
\]

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

\[
\text{NPV} = \sum_{j=0}^{\infty} x_j (1 + i)^{-j} \\
= -0.5 + 0.30 \cdot (1 + 0.1)^{-1} + 0.35 \cdot (1 + 0.1)^{-2} \\
= -0.5 + .273 + .289 = 0.062
\]

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

\[
\text{NPV} = \sum_{j=0}^{\infty} x_j (1 + i)^{-j} \\
= -0.5 + 0.30 \cdot (1 + 0.2)^{-1} + 0.35 \cdot (1 + 0.2)^{-2} \\
= -0.5 + .25 + .243 = -0.0069
\]
Idea of RoR analysis:
What i makes NPV = 0?

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

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

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

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

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

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

$$x = 0.8411 \text{ or } -1.69$$

$$i = 0.188 \text{ or } -1.59$$
Student Talk
Information Management

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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 Bowl’s on average.
- The best team usually wins.

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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

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In the Networked Era...

User
Author or publisher
Indexer or organizer
Librarian
Recommender

How are these roles being changed by networked computing?

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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)

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Exercise

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

Hyperlink
Index
Metadata
Recommendation

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Authors - Publishers
Creates information - verifies, makes available
Indexers
Classifies information

YELLOWPAGES.COM
Indexers/Organizers - Librarians (assists and guides user to needed info)
Librarians
Librarians
Recommenders
Recommenders

What do customers ultimately buy after viewing this item?

74% buy the item featured on this page:
Canon PowerShot A630 8MP Digital Camera with 4x Optical Zoom
$215.40

9% buy
Canon PowerShot A540 6MP Digital Camera with 4x Optical Zoom

7% buy
Canon PowerShot A640 10MP Digital Camera with 4x Optical Zoom
$279.99

5% buy
Canon PowerShot A710 IS 7.1MP Digital Camera with 6x Image-Stabilized Optical Zoom
$259.99

Customers who bought this item also bought:
Lexar Media 1 GB Secure Digital Memory Card (SD1GB-231) (Retail Package) by Lexar
Sony BCC-34HE1 Super-Quick Worldwide Battery Charger with 4 AA NiMH Batteries by Sony
Canon PSC-65 Deluxe Soft Case for A550, A560, A570IS, A630, A640, A700 & A710IS Digital Cameras by Canon
2GB Secure Digital by SanDisk

Explore similar items: Electronics (22) Camera & Photo (13)
Push vs. pull

User

Control over what is provided

Time when it is provided

Intermediate cases:
Notification
Subscription

Publisher

Push

Pull

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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?

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## Characteristics of information pull and push

<table>
<thead>
<tr>
<th></th>
<th>Push</th>
<th>Pull</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control</strong></td>
<td>User requests specific information</td>
<td>User subscribes to information on general</td>
</tr>
<tr>
<td><strong>Notification</strong></td>
<td>User submits question - publisher answers</td>
<td>Publisher provides useful notifications - user decides what to do</td>
</tr>
<tr>
<td><strong>Timing</strong></td>
<td>Information to user directed</td>
<td>Information provider directed</td>
</tr>
</tbody>
</table>
### Proper roles of push and pull in a workgroup

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

*Newsgroups and Web*  
*Email*

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Some modalities of information access

Pull
- Search, navigate, browse

Push
- Aggregate, filter, consolidate
- Subscribe

Intermediary

Delegate

Agent

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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.)