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

- Announcements
- Review: Frito Lay
- Cash Flow
- Student Presentation (news)
- Information Management
- Enterprise Applications
TIM 50

Instructor

- Terry Allen (terry_allen@hotmail.com)
  - Office Hours:
    - Monday and Wednesday, 7:00 p.m. to 8:00 p.m. (if necessary),
    - And Tuesday, 4:00 - 5:00,
    - And Tuesday *by appointment*, 5:00-6:00
    - Office# is E2-563

TAs

- TBD
  - Office Hours:
- Huascar Sanchez (hsanchez@soe.ucsc.edu)
  - Office Hours:
Announcements

- Folio 1 due today
  - (only those not assigned an oral presentation)

- Assignment 2 due Monday (in 1 week)
  - Hard-copy, in class

- Business Paper Proposal (aka “Project proposal) Due Monday 10/24!
  - 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!
  - Once the website is working there will be more details there.
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:

- **Oct 17 (tonight)**
  - Kanta Ito
  - ??

- **Oct 19**
  - ??
  - ?? (Cisco) case

- **SEND ME THE SLIDES THE NIGHT BEFORE (till 9 p.m.)**
  - Failing to do so may cause you to 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

\[ NPV = -3 + \delta + \delta^2 + 2\delta^3 \]

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

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

$$\delta = 1 / (1+i)$$

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

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

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

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

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

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

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

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

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

$$i = 0.188 \text{ or } -1.59$$
Student Talk
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?
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
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)](link) by Lexar
- [Sony BCG-34HE4 Super-Quick Worldwide Battery Charger with 4 AA NiMH Batteries](link) by Sony
- [Canon PSC-65 Deluxe Soft Case for A550, A560, A570IS, A630, A640, A700 & A710IS Digital Cameras](link) by Canon

- [2GB Secure Digital](link) by SanDisk

- **Explore similar items:** [Electronics](link) (22) [Camera & Photo](link) (13)
Push vs. pull

User

Control over what is provided
Time when it is provided

Push

Publisher

Intermediate cases:
Notification
Subscription

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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?
# Characteristics of information pull and push

<table>
<thead>
<tr>
<th></th>
<th>Push</th>
<th>Pull</th>
</tr>
</thead>
<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>
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.)