Reminder: Business Analysis Paper
Preferences Due Thursday!

- **As a group, turn in 3 things:**
  1. List of your proposed group members.
  2. List of companies you would like to study.
  3. Suggested person to do the 5 minute presentation on your group's project.

- If you don't have someone in mind to work with, turn in the above 3 things as an individual.

Another Reminder...

- Assignment 1 is due Thursday also.
  - Resume, and
  - Cover Letter.
- See class webpage for detailed instructions.
- Read:
  - Chapter 2 - Section I of O'Brien (reader pp 69-77)
  - Cash Flow Handout on class webpage

Review: Business Analysis Paper

- Go to class web page and click on business paper in the announcements for detailed guidelines.
- Paper Should Have:
  - Industry Profile
  - Company Profile
  - Information Technology
  - Leadership
  - Market and Financial Performance
  - Trajectory

Review: Citing Sources

- Plagiarism is illegal and cheating and will not be tolerated!!!
- More than thirty words verbatim must be cited.
- Any facts or figures that are not your own must be cited.
  - Ebay's revenues in the US in 2002 were $1.39 billion [1].

**Reference to end note in the body of the text!**

END NOTE:

Review: Citing Sources

- The easiest way to lose points on your paper is to not cite sources!
- Guide on the class website will help you cite your sources correctly.
- Talk to the TA or Instructor if you have questions.

Review: Suggested sources of Information

- Company website
  - 10K report
    - (This is the annual report public companies file with Security and Exchange Commission.)
- Article Databases
  - A database of articles from magazines like "Business Week" and economics journals.
  - Find it at: http://library.ucsc.edu
  - Click on “article database” on left margin.
  - Click on “LexisNexis Academic” or try “Business Source Premier from Ebsco Host.”
  - Try this tonight! And let us know if you have problems on Thursday
- Industry specific publications
- Books
- Good Magazines (The Economist)
- Consulting groups: Forrester, Gartner, ...

STUDENT PRESENTATIONS

- Two Students who previously volunteered will give a talk now.
- Each Student gives a 5 minute talk on a news article they read, and says how it is relevant to the class.

Where are we, and how did we get here?

- Let’s survey the history of IT over the past few decades!

The History of IT from 1960-2000

IT Mgmt from 1960-2000

- The author (Nolan) breaks down history into 3 eras
  - Data Processing Era
  - Micro Era
  - Network Era
- A logical division, but not universal
  - Messerschmitt divides into 4 phases
    - Centralized, Time shared, de-centralized, networked

The Data Processing Era (1960-1980)

- By 1960 economy dominated by large, multi-divisional, hierarchical businesses
  - Corporate Office
  - Divisional operating units in different markets
  - Example: GE
    - corporate office in Connecticut
    - Lighting in Cleveland
    - Locomotives in Erie
    - …
  - Within each division many “functional departments”
    - Accounting, Finance, Engineering, etc.
The Data Processing (DP) Era (1960-1980)

- Needed to keep track of massive amounts of data for
  - Payroll
  - Payments to customers and suppliers,
  - etc.

Meanwhile computers were developed for scientific and defense purposes

These large companies purchased mainframe computers to manage the data processing.

- They were slow, enormous, and expensive, by today's standards.
- But, they did make it possible to process the enormous volume of data, and transactions in a huge corporation

DP Era (1960-1980)

- Commercial computing evolved...
- 1954 -- IBM 650 dominates commercial market
  - Leased for $3,250 per month (over $22,000 per month in today's dollars!)

IBM 360
1964 - IBM 360,

- Interoperable peripheral and computer family
- Great improvement over previous generation
- A massive development effort by IBM
- Ensured IBM's dominance in the 60s and 70s

Data Processing Era (1960-1980)

- "You never got fired for buying IBM."
- Average market share of 68% in the 70s.

Meanwhile

- Digital introduces the mini-computer (1960s)
- UNIX operating system developed (1969)
- Bob Metcalfe invents Ethernet (1973)
**DP Era (1960-1980)**

- **Technology Evolution**
  - First - Stand Alone Mainframes
  - Next - Dumb terminals attached to mainframe
  - ("Time-Shared" Phase in Messerschmitt's terminology)

**Data Processing Era (1960-1980)**

- The information resource manager was known as the Data Processing (DP) manager.
  - Charged with supporting the business
  - Not with changing how the business was run

**DP Era (1960-1980)**

- IS evolved from supporting lower functions to higher level functions
  - Low: Inventory, Purchasing, Scheduling
  - Medium: Productions Operations Management
  - High: Corporate wide planning

**DP Era (1960-1980) -- Annual Budgeting**

- Budgeting was an important function made easier by computers
- Accounting of:
  - Revenues, Expenditures, Assets, Liabilities
  - Generate Profit and Loss Statement
- Before computers:
  - Was difficult to do once a year
- After computers,
  - Could "close the books" more often
  - Could break down profits and losses to each level of the corporate hierarchy

**Capital Budgeting**

- Analyze return and risk of expenditures intended to generate revenue over multiple accounting periods
  - Examples: New building, or factory
- Before computer:
  - Calculations could become complicated
- After computer:
  - Very easy
- Consequence: Every level of the organization could be held accountable for their ROI

**Budgeting**

Better budgeting and resulting accountability lead to consistent earnings growth.
Build up to Micro Era

- 1974 – Xerox PARC develops first computer with a mouse. They don’t commercialize it!
- 1974 – Altair PC for hobbyists
- 1975 – Bill Gates and Paul Allen found Microsoft


- 1981 – IBM introduces its PC!
  - Intel develops CPU
  - Microsoft develops operating system
- IBM PCs were rapidly adopted by the commercial market.


- PCs threatened the DP manager
  - Easier to manage one central mainframe than a PC on every employee's desktop!
  - Data not centralized:
    - The numbers on my PC are right, the ones on your PC are wrong!
  - Security Risks.
  - DP managers put restrictions on PCs
  - Users defied them!

Spreadsheet Example

- VisiCalc (1979)
  - First Spreadsheet
  - For Apple II computer
- Lotus 1-2-3 (1983)
  - Mimicked VisiCalc
  - For IBM PC
- Excel (1985)
  - Microsoft
  - Surpassed Lotus when Windows took off.

Users wanted the convenience of word processing, CAD, etc...
- Vendors marketed direct to the users instead of the DP managers.
- Example: Spreadsheets

- Management realized the importance of bringing order to the chaos
  - Coined the term Chief Information Officer (CIO) in the 80s

**Beginning of Internet**

- 1969 – ARPANET linked scientists
- 1977 – TCP/IP used to link networks to ARPANET
- 1984 – the term Internet comes into use
- 1985 – NSF takes over management of Internet Backbone
- 1990 – WWW (Tim Berners-Lee at CERN)
- 1991 – HTML
- 1993 – Mosaic Browser (Marc Andreessen and Eric Bina)

**The Network Era (1995 - ?)**

- After chaos of Micro Era, organizations converged on Client Server networked architectures
  - Client PC allowed user to have direct access to her own computer
  - Server housed organizational data
- Because of Success of Internet technologies...:
  - UNIX, HTML, TCP/IP
- IT managers used these technologies for internal networks - "intranets"

**The Network Era (1995 - ?) – Internet Phenomenon**

- Internet built on open standards
  - Different than control-oriented development philosophy
  - Benefits: Scalable, Extensible, ...
- Lots of vendors selling Interoperable equipment
  - More decisions to make than the DP manager of the 1960s!
  - Many companies started and flourished.

**Cisco**

- 1984 Founded by Leonard Bosack and Sandra Lerner (Stanford IT Staff)
- Developed a Router
  - A device to forward data packets from one network to another
- By 1998, Cisco had a market value of $100 billion!

**Netscape**

- Founded by Marc Andreessen and Jim Clark
- Browser based on Original Mosaic
- IPO in 1995
  - First day went from $28 → $75!
  - The company’s revenues doubled every quarter in 1995!
- Excitement triggered the dot-com boom.
  - Hundreds of companies started, most didn’t survive...
The network era

- The network era permitted new ways of doing business
  - Employees could check on their benefits with a web browser
  - Customers could "self-serve" themselves
    - In 1998, 70% of Cisco's $800 million of service revenue was provided over Internet, by allowing customers to access their intranet.
  - Wal-Mart used point of sale data to drive supplier replenishment (CRP)

Information Resource Management

- Strategic realization
  - Information is the resource to be managed not just data.
  - Need to get information into the hands of workers, so workers can be more productive.

Result: Organizational Performance Improvement

<table>
<thead>
<tr>
<th>Market Value Rank</th>
<th>Company Name</th>
<th>Sales per Employee</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General Electric</td>
<td>$90,012</td>
</tr>
<tr>
<td>2</td>
<td>Cisco</td>
<td>$20,041</td>
</tr>
<tr>
<td>3</td>
<td>Microsoft</td>
<td>$120,797</td>
</tr>
<tr>
<td>4</td>
<td>IBM</td>
<td>$120,397</td>
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<tr>
<td>5</td>
<td>AT&amp;T</td>
<td>$120,000</td>
</tr>
<tr>
<td>6</td>
<td>Philips</td>
<td>$120,000</td>
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<tr>
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</tr>
<tr>
<td>10</td>
<td>General Electric</td>
<td>$120,000</td>
</tr>
</tbody>
</table>

Source: Standard & Poor's Composite, Market values and Sales per Employee calculated from annual reports.

The Network Era (1995 - ?) - Internet Phenomenon

- For IT manager -- Enormous challenge to manage networks of thousands of computers!

The network era

- Amazon sold books with minimal inventories.
- Levi Strauss used geo-demographic database to match supply and demand in each store
- ...and many more examples!

The Network Era (1995 - ?) - Internet Phenomenon

- "The Technology leader of Tomorrow must be a business leader with all of the management skills of any other senior executive..."

The CIO has gone from being a corporate god in the 1980s to the chief blame taker in the 1990s when IT initiatives often have failed to deliver their promised productivity gains.

1Sifonis and Goldberg, "Changing Role of the CIO," Information Week, March 24 1997
The Network Era (1995 - ?) - Internet Phenomenon

- In 1996 the CIO turnover rate was 17.7%.

- Take Away: Managing IT in the Network Era is difficult, but if you do it right the rewards can be huge!

Deloitte and Touche