Information Systems
ISM 3011
Spring 2004
Unit 3B

Apply Your Knowledge: TCO

• Calculate and compare the TCO of one
ink-jet and one laser printer model.
• Make necessary assumptions and
name them!

Total Cost of Ownership
(TCO)
Purchase Price
+ Installation, Training
+ Supplies
+ Maintenance
TCO
determined by
the chosen brand
determined by
usage and brand

TCO: Cost of Supplies and
Maintenance
• In order to determine the cost of all
supplies and maintenance, one must
make assumptions about the product
usage, e.g.
– how many pages will be printed per week
– how many hours will the machine run per
day (->power consumption)

TCO: Examples of Printer
Supplies
Paper: 10 $ per 500 sheets
Toner: 50 $ for a unit that will last for
2,000 pages
Drum unit: 200 $, needs to be replaced
after 10,000 pages

Approach 1: Divide Price for
Each Part by Amount of
Pages
Paper: 10 $/500 sheets → $ 0.02/page
Toner: 50 $/2,000 pages → $ 0.025/page
Drum unit: 200 $/10,000 → $ 0.02/page
$ 0.065/page
When one prints 12,000 pages over the whole life span of the printer, you have to pay for 2 drum units, not 1.2!

- **Paper:** 500 sheets → $0.02/page
- **Toner:** $2,000 pages → $0.025/page
- **Drum unit:** 200 $/10,000 → $0.02/page

**Approach 2**

- To solve this problem, you can determine the actual number of supply units needed to print the total number of pages.
- Example for 12,000 pages:
  - 24 boxes of paper, 6 toner kits, 2 drum kits

**Example**

- **Assumptions:**
  - Printer costs $300 including installation, but without first drum kit and toner
  - Costs of supplies as on the previous slides
  - Printer will be used for 3 years
- **Usage:**
  - 20 pages per day → 100 pages per week (Mo – Fr) → 5,000 per year (50 weeks) → 15,000 within 3 years

**Example**

<table>
<thead>
<tr>
<th></th>
<th>Approach 1</th>
<th>Approach 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purchase Price</strong></td>
<td>$300</td>
<td>$300</td>
</tr>
<tr>
<td><strong>Supplies</strong></td>
<td>$975</td>
<td>30 Boxes of Paper</td>
</tr>
<tr>
<td><strong>TCO</strong></td>
<td>$1275</td>
<td>8 Toner Kits</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$1275</td>
<td>8 * $50</td>
</tr>
<tr>
<td><strong>TCO</strong></td>
<td></td>
<td>2 Drum Kits</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>$1400</td>
</tr>
</tbody>
</table>

**Case Studies**

**Case 1: Electronic Voting**

**Question 1**

- 215,000 / 313,000 = 2/3 = 66 %
- 66 % of Canberrans voted
- 16,500/215,000 = 7,67 % of the voters tried the new electronic system
- Reasons for the low percentage:
  - Voting is a rare task, thus people are more reluctant to learn new procedures
  - Lack of transparency
Case 1: Electronic Voting
Question 2

• Concerns:
  – Canberra is atypical of the country
  – Rural areas would require a huge number of
    computer systems
  – Security issues
• Security, Privacy, and Transparency are the
  most serious issues.
  – Physical recount is impossible
  – Voting decisions can be traced

Case 1: Electronic Voting
Question 3

• Improvements:
  – Print paper ballots as backup
  – Support online voting (but: increases
    security issues etc.)

Case 1: Electronic Voting
Question 4

• Electronic voting systems in the US
  – Search the Internet and read about the
    ongoing discussions

Case 2: Land Warrior
Question 1

• Power/Battery
  • Cannot be repaired by the soldier

Case 2: Land Warrior
Question 2

• Access to satellite image data (e.g. to
  look behind the buildings etc.)

Case 2: Land Warrior
Question 3

• Soldiers must receive special training to use
  the device
• On the other hand, one must make sure that
  traditional skills remain present, in case the
  Land Warrior fails.
• Availability of devices that do tasks for us
  tend to weaken our own skills, because we
  lack training.
Case 2: Land Warrior
Question 4
• Special forces could be equipped with the Land Warrior first.
• In case of injuries or death, relatives of such soldiers without access to the Land Warrior might regard this as the reason for the incident.

Case 3: Smaller Servers
Question 1
• Advantages:
  – require less space
• Disadvantages
  – higher server density per s/f requires changes in power supply, air-conditioning, and data lines

Case 3: Smaller Servers
Question 2
• Advantages of Server Blades:
  – require even less space than ultra slim servers
  – improved flexibility and performance
  – heat and power issues less critical than with ultra slim servers
• Disadvantages
  – limits: power supply, air-conditioning, and data lines
  – management software required

Case 3: Smaller Servers
Questions 3 & 4
• Question 3:
  – check whether heat and power issues need extra attention
• Question 4:
  – Provide effective management and maintenance software

Thank you!
The slides will be available on the internet at http://ruby.fgcu.edu/courses/mhepp/ (-> CRN10033)