A Holistic Approach to Understanding Information Technology (IT) Costs

Arlene F. Minkiewicz
Chief Scientist
17000 Commerce Parkway
Mt. Laure, NJ 08054
arlene.minkiewicz@pricesystems.com
856-608-7222
Presented at the 22nd Systems and Software Technology Conference (SSTC), 26-29 April 2010, Salt Lake City, UT. Sponsored in part by the USAF. U.S. Government or Federal Rights License.
Agenda

- Introduction
- Information Technology (IT) Budget – What’s Really in There
- What IT really costs – cost drivers
- Supporting Good Decisions with Total Cost of Ownership (TCO)
  - Assessing As-Is costs of an organization
  - Evaluating future projects from a TCO perspective
- Conclusions
Current economic climate is forcing companies to look for ways to cut costs.

Some companies believe that reduced spending on IT is one way to cut operational costs by delaying the purchase of newer hardware and the introduction of new technologies.

This may be true but companies must first establish a realistic view of what their true IT costs are:

- Hardware
- Software
- Application Development
- Support and Help Desk
- Power consumption
- Data management and administration
Introduction

- Traditionally IT cost concerns have focused primarily on the costs of application development.
- While important, this is not enough information to help IT organizations make the right cost decisions going forward.
- Sometimes the most cost effective choices are not the obvious ones.
  - New hardware may have a lower total ownership cost (TOC) than the hardware it’s replacing.
  - Investments in new technology could provide cost saving capabilities.
- IT organizations need a comprehensive understanding of what existing and future capabilities actually cost.
Introduction

- **State of Washington project to automate the state’s vehicle registration and license renewal**
  - License Application Mitigation Project (LAMP) – Initial estimate for $16 M over 5 years
  - Actual and projected costs increased dramatically but the project continued
  - Program continue with cost overruns until it was determined that once deployed the cost to run the system will be 6 times higher than the cost to run the systems it is replacing
  - Program is scrapped after $40 million is spent

- **Would have been nice to know this before the project was launched**
Application Development Projects – while expensive and often risky – only account for a small part of most organizations IT Budgets.

According to Gartner’s “IT Spending and Staffing Report 2008” – typical organizations spent about 20% of their budgets on new application development.

Traditional IT estimating focuses on application development without much thought to Total Ownership Costs (TCO) for IT.
IT Budget – What’s Really in There?

- **Infrastructure**
  - Networks
  - Desktops
  - Servers
  - Development Tools
  - Training
  - Help Desk

- **Utility Applications**
  - Sustain the business

- **Enhancement Applications**
  - Improve the business

- **Frontier Applications**
  - Revolutionize the business

TruePlanning®
by PRICE® Systems

Optimize tomorrow today.®
What IT Really Costs

- **Application Development Costs**
  - Care and feeding of Utility Applications (COTS Integration)
  - Development and maintenance of Enhancement Applications and Frontier Applications (New Software Development/COTS Integration)

- **IT Infrastructure Costs**
  - System Deployment and Networking
    - Purchase of Servers, desktops, notebooks, software, etc.
    - Labor for IT and telecommunications personnel
  - Maintenance and Support
    - Monetary costs for maintenance of hardware and software
    - Labor costs for maintenance
    - Desktop Management, security, end user down time
  - Operation and Administration
    - Space and facilities costs
    - Power consumption

Optimize tomorrow today. ®

TruePlanning
by PRICEx Systems
What IT Really Costs – System Deployment and Networking

- **Major Cost Driver** – Number of Servers which can be determined by looking at:
  - Number of Applications
  - Number of concurrent users
  - Percent and extent of power of servers (mix of high end and low end servers)
  - Level of Virtualization
Additional Cost Drivers include:

- Number of Workstations
- Number of Notebooks (Travelling and Day Extenders)
What IT Really Costs – Maintenance and Support

- **Primary cost drivers**
  - Number of Servers
  - Desktop Management Philosophy
    - End user can change anything
    - Strict usage policies
  - Security
What IT Really Costs – Maintenance and Support

- **Primary cost drivers**
  - Level of Virtualization
    - One physical server is used to create multiple ‘virtual’ server
    - End user sees completely different servers
What IT Really Costs – Operations and Administration

- **Primary Cost Drivers**
  - Number of Servers
  - Space requirements & rental fees
  - Geographical locality
  - Level of Virtualization

![Power Consumption vs Number of Servers](chart1.png)

![Number of Servers vs. Space Requirement](chart2.png)

Optimize tomorrow today.®
Supporting Good Decisions with Total Cost of Ownership – an example

- The Challenge......
  - The Government of Fedonia’s Armed services plans to replace 50% of their classroom and onsite training with web based distributed training classes
  - The IT infrastructure is currently operating at full capacity
  - Investments are required to
    - Develop web based training
    - Bolster the overtaxed infrastructure
  - Fredonia plans to outsource this effort and issues a request for proposal
Supporting Good Decisions with Total Cost of Ownership – an example

- The following three proposals are received
  - Vendor 1 proposes extending the existing server capability through a high degree of virtualization at a cost of $2,000,000
  - Vendor 2 proposes purchasing and deploying additional high end servers at a cost of $3,800,000
  - Vendor 3 proposes extending existing server capability through a medium degree of virtualization combined with custom developed optimization software (developed specifically to support web based training) at a cost of $9,100,000
Supporting Good Decisions with Total Cost of Ownership – an example

- Fredonia, mystified at the wide variance of costs gives each vendor an opportunity to sell their solution.
- Meeting with Vendor 1 clearly indicates they did not understand the problem or the limits of Fredonia’s existing technology.
- Vendors 2 and 3 both appear to have credible solutions, but the cost disparity remains.
- Vendor 3 makes the case that their solution will save the company significant money in later years due to savings in maintenance and operation costs.
As-is costs for IT and Training for next 10 years

**IT**
- Support about 4800 end users
- At any time about 900 concurrent users
- No virtualization
- About 50% of servers are high end

**Training**
- Outsourced at $500 per student
- Average class size is 15
- Average duration of instruction is 16 hours
- Approximately 250 classes per year
As-is costs for IT and Training for next 10 years

<table>
<thead>
<tr>
<th>Worksheet Set:</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Start Date</td>
</tr>
<tr>
<td>2</td>
<td>Deployment Period</td>
</tr>
<tr>
<td>3</td>
<td>Number of Concurrent Users</td>
</tr>
<tr>
<td>4</td>
<td>Number of Applications</td>
</tr>
<tr>
<td>5</td>
<td>Desktop Management</td>
</tr>
<tr>
<td>6</td>
<td>Security</td>
</tr>
<tr>
<td>7</td>
<td>Level of Virtualization</td>
</tr>
<tr>
<td>8</td>
<td>Percent High End Servers</td>
</tr>
<tr>
<td>9</td>
<td>Percent Blade Servers</td>
</tr>
<tr>
<td>10</td>
<td>Number of Workstations</td>
</tr>
<tr>
<td>11</td>
<td>Present Day Extender Notebooks</td>
</tr>
<tr>
<td>12</td>
<td>Present Traveling Notebooks</td>
</tr>
<tr>
<td>13</td>
<td>Percent Day Extender Notebooks</td>
</tr>
<tr>
<td>14</td>
<td>Space Rental Fees</td>
</tr>
</tbody>
</table>

Cost: $13,874,887  Project Cost: $33,446,247

Locked down and well-managed
Advanced
None
50.00%
60.00%
4800
30.00%
10.00%
30.00%
50.00%
Fredonia estimates the cost to maintain the status quo to be $38.5 million.
Option 2

- **IT**
  - Support about 4800 end users
  - Concurrent users could increase by as much as 400
  - No virtualization
  - Increase percent of high end servers to 80%

- **Training**
  - Outsourced at $500 per student
  - Average class size is 15
  - Average duration of instruction is 16 hours
  - Approximately 135 classes per year
  - Develop and deliver web based training
  - Expect approximately 2000 trainees
  - Assume classroom training is phased out over the next 4 years
Option 2

## Increased High End Servers

Fredonia's On-Going Information Technology Costs

### Classroom and on-site training
- Web Based Training

### IT Enterprise

- **Cost:** $30,055,691
- **Project Cost:** $37,887,232

### Worksheet Set: [Inherited]

<table>
<thead>
<tr>
<th>Worksheet Set: [Inherited]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Value</strong></td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>Start Date</td>
</tr>
<tr>
<td>Deployment Period</td>
</tr>
<tr>
<td>Number of Concurrent Users</td>
</tr>
<tr>
<td>Number of Applications</td>
</tr>
<tr>
<td>Desktop Management</td>
</tr>
<tr>
<td>Security</td>
</tr>
<tr>
<td>Level of Virtualization</td>
</tr>
<tr>
<td>Percent High End Servers</td>
</tr>
<tr>
<td>Percent Blade Servers</td>
</tr>
<tr>
<td>Percent Thin Clients</td>
</tr>
<tr>
<td>Number of Workstations</td>
</tr>
<tr>
<td>Percent Traveling Notebooks</td>
</tr>
<tr>
<td>Space Rental Fees</td>
</tr>
</tbody>
</table>

### Labor Requirement:
- **Project Labor Requirement:** 288,110.43 Hours
Option 2

Initial Investment of $3.8 million with Total cost for the 10 years being $37.9 million.
Option 3

- **IT**
  - Support about 4800 end users
  - Concurrent users could increase by as much as 400
  - Medium level of virtualization
  - Percentage of high end servers remains at 50%
  - Custom software development of 50,000 SLOC

- **Training**
  - Outsourced at $500 per student
  - Average class size is 15
  - Average duration of instruction is 16 hours
  - Approximately 135 classes per year
  - Develop and deliver web based training
  - Expect approximately 2000 trainees
  - Assume classroom training is phased out over the next 4 years
Option 3

**Virtualization with custom optimization software**

Fredonia's On-Going Information Technology Costs:

- **Cost:** $15,190,495
- **Project Cost:** $35,462,426
- **Worksheet Set:** Inherited

<table>
<thead>
<tr>
<th>Worksheet Set</th>
<th>&lt;Inherited&gt;</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Start Date</strong></th>
<th>1/1/2010</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Value</strong></th>
<th><strong>Units</strong></th>
<th><strong>Spread</strong></th>
<th><strong>Notes</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Date</td>
<td>1/1/2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Deployment Period</td>
<td>10.00 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Number of Concurrent Users</td>
<td>1,300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Number of Applications</td>
<td>250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Desktop Management</td>
<td>Locked down and well-managed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Security</td>
<td>Advanced</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Level of Virtualization</td>
<td>Medium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Percent High End Servers</td>
<td>50.00%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Percent Blades Servers</td>
<td>60.00%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Number of Workstations</td>
<td>4,800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Percent Default Extender Notebooks</td>
<td>30.00%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Percent Traveling Notebooks</td>
<td>15.00%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Space Rental Fees</td>
<td>30.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Optimize tomorrow today.®
Option 3

Initial Investment of $9.1 million with Total cost for the 10 years being $35.5 million.

By using a software solution augmented by virtualization Vendor 3 has proposed a solution that will reduce overall operational costs in the 10 year time frame
Big Picture Presents Option 3 as Best Choice
Further analysis leads Fredonia to the conclusion that Option 3 is not only the low cost solution but also the most environmentally friendly solution as it reduces the number of servers necessary to achieve desired computing power.

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Power Consumption (kw)</th>
</tr>
</thead>
<tbody>
<tr>
<td>As is</td>
<td>10,863,085</td>
</tr>
<tr>
<td>Option 2</td>
<td>12,552,898</td>
</tr>
<tr>
<td>Option 3</td>
<td>9,414,674</td>
</tr>
</tbody>
</table>
Conclusions

- Traditional IT estimates have focused primarily on application development efforts
  - This is an excellent practice and should continue but by itself it will not provide comprehensive analysis

- 65-75% of the typical IT budget is spent on things other than application development.

- Cost effectiveness is becoming increasingly important for companies in the current economic climate

- In order to make informed decisions about the right application development and infrastructure decisions – businesses must make a holistic assessment of all of the cost implications of such decisions
  - Costs of new projects or equipment
  - Cost impacts on infrastructure and operations of new projects or equipment
  - Factors that drive these costs