MIS 3534 Fall 2014 – Strategic Management of Information Technology

Day 4 – Business Value of IT

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Today, we will discuss …

- How to justify a substantial amount of IT spending in an organization?
- What kind of business value can IT generate for a business organization?
How Much are e*Logistics and ByRequest?

● Try to guess – How much do you think Otis and Wyndham have spend in e*Logistics and ByRequest?

● How can we *justify* such a large amount of investments?

● As a CIO, how would you answer this question from your bosses – *why do we have to throw that much money?*

http://bluegrasstoday.com/gangstagrass-on-justified-tonight/
Physical Security Management at Airport (1/2)

- Why is security a concern at an airport?
- Which individuals should an airport manage for security?
  - everyone who works at the airport
  - airport employees, retail employees, airline employees, government officials, contractors, and others
Physical Security Management at Airport (2/2)

- Which information does a security system have to maintain?
  - Personnel information
  - Security clearance information (who can enter where and can do what?)

- Which process does the security system have to handle?
  - Adding, deleting, and updating personnel and clearance information
  - Information exchange with external systems
  - Tracking and auditing
Current SFO Security Management Process

(A) Paper forms, Manual notifications
(B) Manual assignment

Personnel (Employees, Contractors, Visitors) → Tenant (1...n)

(C) Manual Provisioning

On-premise systems:
- LiveScan
- Training
- Misc (Parking, Fuel Mgmt)
- PACS (1...n)

External Cloud Apps:
- STA
- CHRC

SSS

Badging Office

SSS

SSS

Badge Types
- SIDA/AOA
- Sterile
- Terminal
- Visitor

Privileges
- Tow
- Driver
- Fuel
- Emergency

Security
- Airtraffic
- Custom Seals
What are the problems in this existing process?
Risk in the Current Security System

● What are the risks in the current security system at SFO?

● What could be the WORST-CASE scenarios?
  - An airplane crash with massive casualties
  - Another 9-11
Net Present Value (NPV)

- The sum of the present values of net cash flows in multiple periods up to time $T$

$$NPV = \sum_{t=0}^{T} \frac{R_t - P_t}{(1+i)^t}$$

- $R_t$: Cash inflows or savings at time $t$
- $P_t$: Cash outflows (payments) at time $t$
- $i$: the discount rate (an inflation rate, cost of capital, or an interest rate that the firm pays)
- Reject the project if $NPV < 0$
Internal Rate of Return

- The discount rate \( (i) \) in which the net present value is equal to zero

\[
NPV = \sum_{t=0}^{T} \frac{R_t - P_t}{(1 + i)^t} = 0
\]

- Reject the project if IRR is lower than the cost of capital
  - meaning that it is better to make investments in other projects

- Help compare returns from multiple investment projects
Payback Period (1/2)

- The time at which cash inflows or savings recoup the entire of initial investments
- The time at which cumulative cash inflows or savings exceed the initial investments

Payback Period = 6.3 years
## Payback Period (2/2)

### Table 1. Payback Period Analysis of Future Cash Flow Payments for Three Capital Projects

<table>
<thead>
<tr>
<th>Year</th>
<th>Project A</th>
<th>Project B</th>
<th>Project C</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-$1,000</td>
<td>-$1,000</td>
<td>-$1,000</td>
</tr>
<tr>
<td>1</td>
<td>$250</td>
<td>$350</td>
<td>$500</td>
</tr>
<tr>
<td>2</td>
<td>$250</td>
<td>$350</td>
<td>$500</td>
</tr>
<tr>
<td>3</td>
<td>$250</td>
<td>$350</td>
<td>$500</td>
</tr>
<tr>
<td>4</td>
<td>$250</td>
<td>$350</td>
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<tr>
<td>5</td>
<td>$250</td>
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<tr>
<td>6</td>
<td>$250</td>
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<td>7</td>
<td>$250</td>
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<td>8</td>
<td>$250</td>
<td>$350</td>
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<tr>
<td>9</td>
<td>$250</td>
<td>$350</td>
<td>$500</td>
</tr>
<tr>
<td>10</td>
<td>$250</td>
<td>$350</td>
<td>$500</td>
</tr>
</tbody>
</table>

### Payback Period Comparison

<table>
<thead>
<tr>
<th>Project</th>
<th>Payback Period</th>
<th>Cash Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4 yrs.</td>
<td>$2,500</td>
</tr>
<tr>
<td>B</td>
<td>3 (2.86) yrs.</td>
<td>$1,750</td>
</tr>
<tr>
<td>C</td>
<td>2 yrs.</td>
<td>$1,500</td>
</tr>
</tbody>
</table>

Payback Period Calculation:

$$\text{Payback Period} = 2 + \frac{1,000 - 700}{1,050 - 700} = 2.86$$
Your Recommendation

- What is your recommendation? Go ahead with this or not?
- How certain are you?
  - Are you certain that everything will pan out as predicted?
- Which assumption or prediction is most sensitive (critical)?
Sensitivity Analysis

- A ROI analysis hinges on a number of assumptions and predictions.
  - e.g. The number of new users will increase by 10% annually, or the required man-hours for record-keeping will be reduced by 88%.
- There is no guarantee that all the assumptions will be correct.
- Sensitivity analysis: How would predicted returns (NPV, IRR) change when one or more assumed parameters change?
  - to find out to which assumption the predicted returns are most sensitive.
Problems with ROI Analysis

What would be the problems with the ROI analysis we just did?

- What does this fail to account for?
- Intangible (hard-to-quantifiable) benefits and costs
Intangible or unexpected costs

• What would be intangible (hard-to-quantify) costs?
  ▪ Employee training and adjustment, work disruption
  ▪ Costs in maintaining old and new systems concurrently

• What would be unexpected costs that we need to be mindful?
  ▪ Project delays and cost overrun, system failures
  ▪ Resistance of employees to accept the new system
  ▪ Unidentified security risk in the new system

Intangible (Soft) benefits

- What would be intangible (hard-to-quantify) benefits?
- How would you quantify benefits from increased compliance? Based on what?
- How would you quantify benefits from reduced security risks?
- How would you make your numbers believable to your bosses?

http://sourcesofinsight.com/quantification/
Intangible (Soft) benefits from OTISLINE

- What would be the intangible (hard-to-quantify) benefits from OTISLINE?
- How to categorize them?
Regional offices are geographically dispersed throughout North America.
Zone directors have three to five district managers reporting to them.
District managers have two to six branch/field offices reporting to them.
Balanced Score Card (BSC)

http://vectorstudy.com/management-theories/balanced-scorecard
Construction Company Strategy Map

Themes: Become One Company | Create a Bigger Footprint | Differentiate | Penetrate Deeper

Financial
- Grow Fees In Backlog
- Increase Earnings
- Increase Margins
- Increase “Hit Rate”
- Increase Sole Source Awards

Customer
- Improve Customer Satisfaction
- Enhance Service to the Customer
- Improve Risk Management
- Improve Service to the Customer
- Improve Alignment of Corporate Shared Services

Process
- Improve Internal Communication
- Improve Information Flow
- Improve Process Discipline
- Improve Process Discipline
- Improve Alignment of Corporate Shared Services

People
- Increase Organizational Talent & Leadership
- Grow Superintendents
- Grow Project Managers
- Improve Rewards & Recognition
- Improve Talent Development
- Improve Succession Planning

http://www.balancedscorecard.org/portals/0/pdf/Make_Performance_Improvement_Strategic_BSI_Rohm.pdf
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**Objectives**

- Revenue Growth
  - Net Sales
  - Comparable Sales
  - Sales / Sqft.

- Profitability
  - GM %
  - GMROI
  - MMU %
  - EBITDA
  - EBIT
  - EPS

**Metrics**

- Improve Brand Awareness
  - Market Survey Rankings

- Memorable Shopping Experience
  - Customer Survey Rankings
  - Mystery Shopper Rankings

- Increase Share
  - % Market Share
  - % Wallet Share

**Perspectives**

- Internal Process
  - Improve Vendor Process
    - % On Time Delivery
    - % Defects
  - Improve Brand Management Process
    - Marketing Lift
    - Marketing Residual Value
  - Improve Supply Chain Mgmt
    - % In Stock
    - Inventory Turns
    - Inventory Levels

- Customer
  - Improve Brand Awareness
  - Memorable Shopping Experience
  - Increase Share

- Learning & Growth
  - Employee Development
    - % Employees Bootcamp trained
    - Training $ / Employee
    - % Management achieving MBOs
  - Innovation
    - Employee Suggestions / Month
    - % Customer Suggestions Implemented
    - % New Products vs. Overall Products

http://www.information-management.com/specialreports/20040720/1006858-1.html
Example Balanced Scorecard: Regional Airline

**Mission:** Dedication to the highest quality of Customer Service delivered with a sense of warmth, friendliness, individual pride, and Company Spirit.

**Vision:** Continue building on our unique position -- the only short haul, low-fare, high-frequency, point-to-point carrier in America.

<table>
<thead>
<tr>
<th>Theme: Operating Efficiency</th>
<th>Objectives</th>
<th>Measures</th>
<th>Targets</th>
<th>Initiatives</th>
</tr>
</thead>
</table>
| Financial                   | Profitability  
  * Profitability  
  * Fewer planes  
  * Increased revenue  
  Increase Revenue  
  Lower costs | Market Value  
  Seat Revenue  
  Plane Lease Cost | 25% per year  
  20% per year  
  5% per year | Optimize routes  
  Standardize planes | |
| Customer                    | Flight is on-time  
  * Lowest prices  
  * More Customers  
  More Customers  
  Lowest Prices  
  On-time flights | FAA On Time  
  Arrival Rating  
  Customer Ranking  
  No Customers | First in industry  
  98% Satisfaction  
  % change | Quality management  
  Customer loyalty program | |
| Internal                    | Fast ground turnaround  
  * On Ground Time  
  On-Time Departure  
  Improve Turnaround Time | <25 Minutes  
  93% | Cycle time optimization program | |
| Learning                    | Ground crew alignment  
  * % Ground crew stockholders  
  * % Ground crew trained  
  Align Ground Crews | yr. 1 70%  
  yr. 4 90%  
  yr. 6 100% | Stock ownership plan  
  Ground crew training | |
Key Questions in BSC

- **Finance**: Through the eyes of the owners of the business, how will they judge financial success?

- **Customer**: Through the eyes of our customers, how will they judge the value of our products and services? How will we differentiate ourselves in the market?

- **Internal Business Process**: How can we improve internal processes to improve product, program and service quality, timeliness, economics, and functionality?

- **Learning and Growth (or Employee)**: How can our employees continuously get smarter, innovative, and improve?

http://www.balancedscorecard.org/LinkClick.aspx?fileticket=oPNqFu3i3gE%3d&tabid=56
## Business Value of OTISLINE

### Improved Profits

<table>
<thead>
<tr>
<th>FINANCIAL</th>
<th>Increased Service Contracts</th>
<th>Increased Elevator Sales</th>
</tr>
</thead>
</table>

### Customer

<table>
<thead>
<tr>
<th>CUSTOMER</th>
<th>Reduced Customer Complaints</th>
<th>Reduced Contract Cancellation</th>
<th>Improved Satisfaction and Relationship with Building Owner</th>
<th>Enhanced Brand Images to Individual Riders</th>
</tr>
</thead>
</table>

### Internal Process

<table>
<thead>
<tr>
<th>INTERNAL PROCESS</th>
<th>Reduced Response Time</th>
<th>Improved Product Reliability</th>
<th>More Correct Problem Diagnosis</th>
<th>Consistency in Service Quality</th>
<th>Reduced Service Costs</th>
</tr>
</thead>
</table>

### Learning & Growth

<table>
<thead>
<tr>
<th>LEARNING &amp; GROWTH</th>
<th>Transparency &amp; Communication</th>
<th>Faster Decision Making &amp; Communication</th>
<th>Flexible Employee Deployment</th>
<th>Improved Employee Training</th>
</tr>
</thead>
</table>
Business Value from Different IT Categories

IT Asset Category

● **Transitional IT**: IT that is primarily used to cut costs or increase throughput for the same cost

● **Informational IT**: to provide information for purposes such as accounting, reporting, compliance, communication, or analysis

● **Strategic IT**: to gain competitive advantages by supporting entry into new markets or by helping develop new product, services, or business processes

● **Infrastructure IT**: the shared IT services used by multiple applications such as servers, network, and databases

Different IT Assets Deliver Different Value

The up and down arrows gauge the average changes in profitability, innovation and market value the year after an IT investment is made. For example, companies that invest more heavily than their competitors in transactional IT have lower costs.

### Companywide IT Savvy Affects Performance

Our research assessed each company’s relative IT savvy by cataloging its practices, processes and capabilities. As indicated below, across all four IT asset classes, companies with high IT savvy achieved higher performance from each IT dollar invested.

<table>
<thead>
<tr>
<th></th>
<th>Lower Cost of Goods Sold</th>
<th>Profit</th>
<th>Innovation</th>
<th>Market Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Savvy of Company</strong></td>
<td>Low</td>
<td>Average</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td><strong>INFRASTRUCTURE</strong></td>
<td>▼</td>
<td>▲</td>
<td>▲</td>
<td>▼</td>
</tr>
<tr>
<td><strong>TRANSACTIONAL</strong></td>
<td>▲</td>
<td>▼</td>
<td>▲</td>
<td>▼</td>
</tr>
<tr>
<td><strong>INFORMATIONAL</strong></td>
<td>▼</td>
<td>▲</td>
<td>▲</td>
<td>▼</td>
</tr>
<tr>
<td><strong>STRATEGIC</strong></td>
<td>▼</td>
<td>▲</td>
<td>▲</td>
<td>▼</td>
</tr>
</tbody>
</table>

- What do you think *IT savvy* is?

The Five Characteristics of IT Savvy

Companies with high IT savvy have developed five mutually reinforcing characteristics.* The first three are practices related to IT use and the last two are competencies needed for high IT savvy.

**Practices**

1. **IT FOR INTERNAL AND EXTERNAL COMMUNICATION**
   - Intensity of electronic communication media such as e-mail, intranets and wireless devices for internal and external communications and work practices

2. **INTERNET USE**
   - Internet-based architectures (i.e., open) for key functions like sales force management, employee performance measurement, training and post-sales customer support

3. **DIGITAL TRANSACTIONS**
   - Percent digitization of transactions executed with both suppliers and customers

**Competencies**

1. **COMPANYWIDE IT SKILLS**
   - Technical and business skills of IT people, IT skills of business people and ability to hire skilled IT people

2. **MANAGEMENT INVOLVEMENT**
   - The degree of senior management commitment to IT projects and the degree of business unit involvement in IT decisions

Justification of Business Value of IT

- Business value and benefits from IT investments are multi-faceted and dynamic.

- A CIO should be able to justify IT’s business value not only in terms of easy-to-measure indicators such as efficiency, cost reduction, or product quality but also with hard-to-measure (intangible), long-term factors such as customer satisfaction, brand, or market value.

- A CIO should not overlook strategic values (organizational agility, business flexibility) and innovation.
Next Class

- Cost of IT
- Read the IT Adventure Chapter 4 and 5 and write one brief of up to 200 words by 5:30pm on Sep. 29.
- Sign up for presentation
  - IT Adventure - Chapter 4
  - IT Adventure - Chapter 5