Investing in Human Factors Training: Assessing the Bottom Line

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Continental Airlines Inc.
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Overview

• Benefits / Cost / Timing
• Example: “Icarus Airways”
• Finance 101
• Bottom Line
Benefits vs. Costs

• Benefits
  – “Hard” or “Tangible”
    • Reduced Ground Damage
    • Fewer On the Job Injuries
    • Reduction of Delays & Cancellations
    • Fewer / Less Costly Fines
    • Increased Dispatch Reliability
  – “Soft” or “In-Tangible”
    • Increased Communication
    • Smoother Shift Turn Overs
    • Perception of the Flying Public
    • Increased Job Satisfaction
    • Teamwork

• Costs
  – Start-Up
    • Development / Research
    • Materials
    • Video
    • Computer
    • Prototype / Review
    • Personnel
  – Ongoing
    • Instructor Time
      – In-house vs. OSV
    • Student Time
      – OT vs. Straight time
    • Facility / Equipment Rental
    • Materials
    • Travel / Per diem
    • Shipping
    • Enhancements / Upgrades
Cost Factors To Consider

• Who
  – Management
  – AMTs only
• How Many
  – Total / Per class / classes per year
• Length of Class
  – 4 hour
  – 1-day
  – 2-day
• Where
• Type of Classes
  – HF Facilitator
  – MX Instructor
  – CBT / Video Based
  – Recurrent
• Cost of OT coverage for students
• Company’s Cost of Capital
Tangible Benefits to Consider

- Safety
  - Ground Damage
  - On the Job Injuries

- Dependability
  - On-Time Departures
  - On-Time Maintenance

- Efficiency
  - Contained Overtime Costs
In-Tangible Benefits to Consider

- Increased Communication
- Smoother Shift Turn Overs
- Perception of the Flying Public
- Increased Job Satisfaction
- Teamwork
“Icarus Airways”
Assumptions

- 2000 students (Management & Technicians)
- 5 Years
- 20 students per class
- Year 0 - Development Time
- Year 1 - 20 classes per year
- Year 2 - through 5 - 30 classes per year
- 2 Major Facilities / 10 Smaller Stations
- 1 HF Engineer / Facilitator (12 trips per year)
- Overtime for Graves & Second Shift (1/2 population)
## Start-Up Cost Breakdown

<table>
<thead>
<tr>
<th>TYPE</th>
<th>FORMULA</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developer</td>
<td>Two Each for 1 Month: $4,500/Mo X 1.3 (Benefits) X 2</td>
<td>$11,700</td>
</tr>
<tr>
<td>Materials</td>
<td>Research, Equipment: $1,000/Min X 30 Min = $30,000</td>
<td>$2,000</td>
</tr>
<tr>
<td>Video</td>
<td>Develop In-House: $1,000/Min X 30 Min = $30,000</td>
<td>$7,500</td>
</tr>
<tr>
<td></td>
<td>Purchase OTS: Rights to copy</td>
<td>$7,500</td>
</tr>
<tr>
<td>Prototype / Review</td>
<td>~30 Hrs X 2: $63.34/Hr X 2</td>
<td>$3,800</td>
</tr>
<tr>
<td><strong>Total Cost for Development</strong></td>
<td></td>
<td><strong>$25,000</strong></td>
</tr>
</tbody>
</table>
## On-Going Cost Breakdown

<table>
<thead>
<tr>
<th>TYPE</th>
<th>FORMULA</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilitator</td>
<td>$33.75/Hr X 24 Hrs</td>
<td>$810</td>
</tr>
<tr>
<td>Travel / Per diem</td>
<td>$150/Day X 3 Days</td>
<td>$450</td>
</tr>
<tr>
<td>Student OT Coverage</td>
<td>20 Students X $10.88/Hr X 8 Hrs</td>
<td>$1,740</td>
</tr>
<tr>
<td>Facility / Classroom / Equip.</td>
<td></td>
<td>$200</td>
</tr>
<tr>
<td>Shipping of Materials</td>
<td></td>
<td>$100</td>
</tr>
<tr>
<td>Course Changes &amp; Upgrades</td>
<td></td>
<td>$100</td>
</tr>
<tr>
<td>Measurement &amp; Evaluation</td>
<td></td>
<td>$100</td>
</tr>
<tr>
<td><strong>Cost Per Class</strong></td>
<td></td>
<td><strong>$ 3,500</strong></td>
</tr>
</tbody>
</table>
# Ongoing Benefits Breakdown

<table>
<thead>
<tr>
<th>TYPE</th>
<th>COST AT &quot;YEAR 0&quot;</th>
<th>% REDUCTION</th>
<th>BENEFITS @ Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tangibles</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ground Damage</td>
<td>$147,058</td>
<td>*68%</td>
<td>$100,000</td>
</tr>
<tr>
<td>On the Job Injuries</td>
<td>$666,666</td>
<td>*12%</td>
<td>$80,000</td>
</tr>
<tr>
<td>Overtime</td>
<td>$200,000</td>
<td>*10%</td>
<td>$20,000</td>
</tr>
<tr>
<td><strong>In-Tangibles</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delays &amp; Cancellations</td>
<td>$$ / Delay ?</td>
<td></td>
<td>$50,000</td>
</tr>
<tr>
<td></td>
<td>$$ / Cancellation?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shift-Turnovers</td>
<td></td>
<td></td>
<td>$25,000</td>
</tr>
<tr>
<td>Team Work</td>
<td></td>
<td></td>
<td>$25,000</td>
</tr>
<tr>
<td><strong>Total Benefits at Year 5</strong></td>
<td></td>
<td></td>
<td>$300,000</td>
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</table>

Benefits vs. Costs = $235,000!!!
“Finance 101”

- Return On Investment
- Cost of Capital
- Time Value of Money

(Hint: Do not proceed without a friend from Finance!)
Return on Investment

ROI = (Benefits - Costs) ÷ Costs = ? %

∴ (750 - 515) ÷ 515 = 45% ROI

Looking Good!
What’s your Company’s Cost of Capital?

Example:

“Icarus Airways” is 12%

(MRM ROI) - (C of C) = Difference

:. 45% - 12% = 33%

Still Looking Good!
<table>
<thead>
<tr>
<th>Year</th>
<th>Present Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits</td>
<td>$431,980</td>
</tr>
<tr>
<td>Costs</td>
<td>$(332,367)</td>
</tr>
<tr>
<td>Net</td>
<td>$99,613</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sum</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$750,000</td>
<td></td>
</tr>
</tbody>
</table>

Net: $515,000
Time Value of Money

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New ROI \( \frac{($431,980 - $332,367)}{431,980} = 23\% \)
### Time Value of Money

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<thead>
<tr>
<th>Year</th>
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<th>Benefits</th>
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<th>Net</th>
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<tbody>
<tr>
<td></td>
<td>Sum</td>
<td>$431,980</td>
<td>$(332,367)</td>
<td>$99,613</td>
<td>($431,980 - $332,367) ÷ $431,980 = 23%</td>
</tr>
<tr>
<td></td>
<td>Sum</td>
<td>$750,000</td>
<td>$515,000</td>
<td></td>
<td>Still looks better than 12%!</td>
</tr>
</tbody>
</table>

Still looks better than 12%!
If The Numbers Don’t Work

- Reduce class hours
- Look for other benefits
- Re-evaluate your costs
- Less aggressive schedule
- Go to an Outside Vendor (OSV)
- Use Off-the-Shelf (OTS) Program
- Show video followed by discussion
- Consider Computer Based Training (CBT)
“Bottom Line”

- Talk to Finance first, not last!
- Define your “True Costs”
- Phase in benefits and costs over time
- Be aware of the “Time Value of Money”!
Thank You!