Cost Justification and the ROI of Ergonomics Program Improvements

James Mallon, B.Sc., M.Sc., MBA, CPE
Executive Vice President
jmallon@humantech.com
734-663-6707

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ROI = \frac{\text{BENEFIT} - \text{COST}}{\text{COST}}

3 Things in 20 Minutes...
1. Approach Matters… Alot
2. Research into Benefits
3. Demonstrating Business Value

Approach Matters

Ergonomics Maturity Curve™

3 Things in 20 Minutes...

1. Approach Matters... Alot
2. Research into Benefits
3. Demonstrating Business Value

What about us?

45 Studies (1988 – 2006) which study both system and health effects Ergonomics Design

- 38 Studies did it well
- 87% (33) demonstrated win-win
- 10% (4) demonstrated a lose

Researching the LINK

<table>
<thead>
<tr>
<th>Reference</th>
<th>Study description</th>
<th>Human effect</th>
<th>System effect</th>
<th>Results</th>
</tr>
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<tbody>
<tr>
<td>N. and Bron (2006)</td>
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3 Things in 20 Minutes…

1. Approach Matters… Alot
2. Research into Benefits
3. Demonstrating Business Value

A good business case presentation has:
- a clear and dimensioned ($) problem statement
- support from key stakeholders and a sponsor
- listing of possible plans to address problem
- description of selected plan/approach
- description of costs and needs
- description of benefits
- key watch outs
- key metrics
- visuals

Impact of Ergonomics

Quality
Productivity
Engagement
MSD Rate & Costs

Initial $10,000 investment

FIGURE 1. Portfolio starting at five winners versus S&P 500.


In business, the purpose of the “return on investment” metric is to measure rates of return on money invested in order to decide whether or not to undertake an investment.
ROI = \frac{P + Q + E + I - \text{Cost}}{\text{Cost of People, Equipment and Program}}

Where:
- \( P = \% \text{ Improvement} \times \text{Output } $ \)
- \( Q = \% \text{ Improvement} \times \text{Scrap / Rework cost} \)
- \( E = \% \text{ Improvement} \times \text{Turnover / Absenteeism cost} \)
- \( I = \% \text{ Improvement} \times \text{Injury/Illness cost} \)

Research into Benefits
- 60 Published Articles or Case Studies from 1995 to 2013
- Used Manufacturing operations
- Data is not normalized for length of study

Productivity
Ways to measure productivity:
- Throughput
  - Value of increase in units per shift
- Cycle time reduction
  - Value of time saved per shift

Quality
Ways to measure quality:
- Scrap Rate
  - Value of “lost” units per shift
- Rework
  - Value of time spent “fixing” errors

Engagement
Ways to measure engagement
- Gallup Survey “Q12”
  - Do you have the materials and equipment to do your work right?
  - At work, do you have the opportunity to do what you do best every day?
  - Does your supervisor, or someone at work, seem to care about you as a person?
  - At work, do your opinions seem to count?
  - Are your associates (fellow employees) committed to doing quality work?

Cost Avoidance
Ways to measure cost avoidance:
- Direct MSD compensation costs
- 1:4 ratio for indirect costs
Research into Benefits

1. 60 Published Articles or Case Studies from 1995 to 2013
2. Manufacturing operations
3. Data is not normalized for length of study

![Graph showing productivity and engagement percentages](image)

**Research into Costs**

- Surveyed 26 clients viewed as leaders
- Varied Manufacturing Industries
- Simple 10 question survey

![Bar chart showing cost distribution](image)

ROI = \[ P + Q + E + C - \text{Cost} \]

Where:
- \( P \) = % Improvement x Output $
- \( Q \) = % Improvement x Scrap / Rework cost
- \( E \) = % Improvement x Turnover / Absenteeism cost
- \( C \) = % Improvement x Compensation cost
$$ROI = \frac{P + Q + E + C - Cost}{Cost of People, Equipment and Program}$$

<table>
<thead>
<tr>
<th>Quartile 1</th>
<th>Average</th>
<th>Quartile 3</th>
<th>Worst Case</th>
<th>Best Case</th>
<th>Average Cost</th>
<th>Avg. ROI Benefit</th>
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</thead>
<tbody>
<tr>
<td>Benefit</td>
<td>$175,500</td>
<td>$268,284</td>
<td>$305,525</td>
<td>$175,306</td>
<td>$510,529</td>
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<tr>
<td>Cost</td>
<td>$15,775</td>
<td>$40,335</td>
<td>$102,860</td>
<td>$15,775</td>
<td>$83,513</td>
<td>$83,513</td>
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<tr>
<td>ROI</td>
<td>3.05</td>
<td>3.81</td>
<td>1.97</td>
<td>0.69</td>
<td>13.27</td>
<td>1.08</td>
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</tbody>
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$$ROI = \frac{BENEFIT - COST}{COST} = 3:1$$