Calculator Instructions Document/Example

This document serves to provide a step by step guide to using the Ergonomic Intervention calculator using a made-up example for a reference. It is important to note that all metrics should be based on the same time frame. If injuries used are over the last year, the rest of the metrics entered should be on a one-year basis.

A video walkthrough of this content is available at: https://youtu.be/mWplPFpmwcY

1. The calculator starts out on the "Pre-DataEntry" tab, starting with the "Business Overview" section in the top right.

Business Overview

Number of employees in area of interest: 50

Average hourly wage of employees: $ 10.00

Direct cost of injuries over the last year for area of Interest: $ -
NOTE: If unknown, leave as 0 and select from estimates, reference help table for direct cost

Size of business in terms of employees and sales: Small; 0-50 employees, Sales ≤$10,000,000

Indirect cost incurred from injuries over the past year: $ -
NOTE: If unsure, leave as 0 and use estimates below, reference help table for indirect cost

Estimation of indirect cost based off company size: $ 32,122.19   to $ 48,183.28

  a. The top line is used to enter the number of employees that are present in the area that will be improved
  b. Second line is used to enter the average hourly wage of these employees of interest
  c. The third line is used to enter the direct cost of injuries saw over the last year in that department of workers. Don't have that data? No worries, you can use the section to the right of this section to select the injuries and quantities to get estimates as seen below.

Estimates relating to type and quantity of injuries
Do not use if direct cost are known, as they will be more accurate

Types	Quantity	Direct Cost	Indirect cost Low	Indirect cost High
Shoulder Strain	1	$ 10,178.52	$ 10,178.52	$ 15,267.79
Back Strain	1	$ 6,413.40	$ 6,413.40	$ 9,620.10
Epicondylitis (Tennis Elbow)	1	$ 8,003.54	$ 8,003.54	$ 12,005.30
Knee Strain	1	$ 7,526.73	$ 7,526.73	$ 11,290.09
None	0	$ -	$ -	$ -
None	0	$ -	$ -	$ -

d. The next line is for entering the size of your business. This is important for estimating the range of indirect cost that are associated with the direct cost.
e. The last box is for indirect cost associated with the injuries. This should be left blank unless the indirect costs are known. It will estimate the indirect from either the direct cost entered, or the direct cost estimated.
f. The final line of this section shows the estimated indirect cost of the injuries based on company size.
2. The next section is "Process Overview".

Process Overview			
Average planned hours per shift:	8	Number of shifts per day:	1
Average current cycle time(mins):	27.00	Average productivity rate :	0.04
		-or-	
Total overtime hours needed per day:	1	Average throughput:	20
Number of accidents in department:	4	Sales per day:	20
Product demand per day:	22	Profit from Sales:	$ 1,000.00

a. The top left line is used to enter the average hours per shift worked that does not include overtime, such as 8-hour or 10-hour shifts.
b. The top right is used to enter the number of shifts worked per day in the section.
c. The second line on the left is used to enter the average cycle time. If this is not readily available, it will be a calculated field based on throughput and hours worked per day.
d. The second item on the right side is used to enter the productivity rate. If this is not known, just skip it and it will be auto calculated based off average throughput.
e. The third item down on the left is used to enter the number of overtime hours needed per day to keep up with demand. It is important to note that this is per day and not per shift.
f. Third item down on the right, as mentioned above, is used to enter the average daily throughput from operations. This is used to calculate the cycle time and productivity rate.
g. The fourth item down on the left is used to enter the number of accidents in the department of interest over the last year. This should match with the top section if you used the estimator tool.
h. The fourth item down on the right is used to enter the sales per day. This helps estimate future sales potential.

i. The last item down on the right is for entering in the product demand per day. This helps with estimating future sales because there is no value in estimating future sales numbers that exceed product demand.

j. The last item on the right is used to enter the profit from the sales. This is used to help estimate the potential profits that could be seen from the improvements.

3. The third section to be filled out is the "Quality Overview" section.

Quality Overview		
Yield Rate: 75	Internal Failure Cost:	$ 1,900.00
Rework Rate: 10	External Failure Cost:	$ 2,500.00
Scrap Rate: 15	Number of Customer Complaints	18

a. The first box on the left is used to enter the yield rate. The yield rate is the percent of products that are free from defects the first time through.

b. The first box on the right is used to enter the cost of internal failures. These are the cost associated with all internal failures observed in the process.

c. The second box on the left is used for rework rate. This is the percent of items that must be reworked to be accepted.

d. The second box on the right is used to enter the external failure cost. These are all cost from product defects and failures after the product leaves the faciality.

e. The last option on the left is used to enter the scrap rate. This is the percent of items that cannot be reworked and are simply scrapped.

f. The last box on the right is used to enter the number of customer complaints.

4. The fourth section is "Cost Associated with the Intervention and Other Estimates".

Cost Associated with the Intervention and Other Estimates:			
Cost of supplies/material involved: $ 500.00	Any other one time cost:	$	-
Cost of labor for all involved: $ 500.00	Annual reoccurring costs:	$	-
Cost of training for the intervention: $ -	Current rating of worker morale:		4
Current employee turnover rate(%): 20	Cost to hire and train employee:	$	800.00

a. The first box on the left is used to enter the cost of all supplies and materials that will be used in the intervention.

b. The first box on the right is used to enter any other one-time cost associated with the intervention that isn't directly related to the material and supplies going into the project.

c. The second box on the left is used to enter the cost of all labor associated with the intervention that directly has to do with it. This labor can include project overseers, workers building/implementing the project and other forms of labor hours.

d. The second box on the right is used to enter the reoccurring cost associated with the project, such as a yearly calibration or cleaning of the device that isn't part of normal operations.

e. The third box on the left is used for entering the cost of training employees to use the new device or method if there is a need to.

f. The third box on the right is used to enter a worker morale rating. This is just an estimate of how much employees enjoy their job in the current state and is used to show how worker morale went up or down after the intervention.

g. The box on the bottom left is used to enter the current employee turnover rate and helps show the before and after rate from the intervention to visually see the improvement.

h. The box on the bottom right is used to enter the cost of training a new employee so the user can visually see if the cost changed over a year after the intervention.

5. The last section to fill out is the "Intervention Impact Opinions".

Intervention Impact Opinions

We believe the impact on injury/illness rate will be:	Moderate
We believe the impact on prouductivity will be:	Moderate
We believe the impact on quality will be:	Moderate

a. The first line is used to estimate the impact the user thinks the intervention will have on the injury/illness rate that was recorded. This is used for estimating the projections.

b. The second line is used to estimate the impact the user thinks the intervention will have on the productivity of the area involved. This is used for estimating the projections.

c. The third line is used to estimate the impact the user thinks the intervention will have on the quality of the area involved. This is used for estimating the projections.

6. The next tab, "Pre-Summary", is used to summarize all the data from the form just filled out, and then gives projections.
    a. The left side of the display summarizes the data entered on the form.
    b. Then, moving right, it summarizes the cost of the intervention.
    c. Continuing, it gives a summary of the projected values based on the form that was filled out.
    d. The last section on this tab gives the projected costs avoided by less injuries and projected cost savings based on the projected improvements.
7. The next tab "Post-DataEntry" is almost identical to the first tab explained above and should be filled out the same way about a year after project implementation.
8. Following that form, the next tab is "Post-Summary". This tab is used to summarize the after-intervention metrics against the previous metrics.
    a. The first column on the left summarizes the metrics entered on the form.
    b. The next column on the right is a summary of the first form again, to let the user see the side by side comparison.
    c. The next column is the actual total cost from the intervention.
    d. The last column shows the user the actual cost avoided, and costs saved from the intervention.
9. The last tab, "Post-Comparison", shows the actual savings compared against the previous projections to show how close they were. There is a "difference" column associated with each section that lets the user see if they did better, worse, or about the same as the projections had predicted.