CALCULATING THE INVESTMENT RECOVERY FROM SKILL TRAINING

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Background

Training is often considered to be a cost rather than an investment. This statement is particularly evident when business conditions are in decline. When business expenses must be reduced, training budgets are generally the first to be cut.

Perhaps the reason that training is considered to be a cost is that there are few attempts to make a business case for training as an investment. As a result, training is not considered to be a key success factor for a business.

The key to elevating training to a strategic focus of a business is to illustrate how training advances the objectives of the business. Training must be transformed from a cost into an investment.

This paper illustrates how training can serve as an investment that advances the business just as capital expenditures are treated. A case study illustrates how this methodology was used in a manufacturing business.

The Concept of Hidden Costs

Conventional accounting systems reflect the cost of business activities, but this system mentions nothing about the value generated from the costs. For example, labor costs are treated as an expenditure in an accounting system, but the value generated from the labor expenditure is not provided.

Hidden costs represent the financial impact of low-value business activities. The hidden costs of labor expenditures reflect the value that could be generated from the labor expenditures but are not. Many of these hidden labor costs are due to deficiencies in employee skills. If the hidden costs of low employee skills can be identified, then a business case for training can be developed.

Training that advances job skill development can be linked to the reduction of hidden costs. Thus, training can be treated as an investment.

Measuring Hidden Costs

The hidden costs of job skill deficiencies can be thought of as the costs incurred by employees who fail to produce the value expected of them. There are generally two circumstances in which these costs are incurred.

- Employees who are moving into new positions and have failed to acquire the job skills that they need.
- Employees who have been in jobs long enough to acquire job skills but are not functioning at desired performance levels.
The process of measuring these costs examines the value that is lost when employees lack the skills that they need to function as fully productive employees.

For new employees, hidden costs are the costs incurred during the training period for which there is little or no value generated. Furthermore, additional value is lost by the trainer who must spend time developing the new employee.

As an example of how this cost is calculated, consider a business that spends 20 hours training a new employee. Training is provided by a senior employee who typically works at a 75% performance level during the training of a new employee. The new employee’s wages are $7.25/hour, and the senior employee’s wages are $13.50/hour. The value generated per hour worked by employees is $20.10.

The hidden costs are calculated as follows.

\[
\text{Hidden costs} = \text{Hours trained} \times \text{opportunity costs}
\]

The opportunity costs for the new employee represents the loss in value that is incurred during the training period. In our example, the opportunity costs for the new employee will be the value per hour added that would be generated by the employee ($20.10/hr.) minus the cost of the employee’s wages ($7.25/hr.) or $12.85/hr. This calculation assumes that the new employee is generating no value during the training period.

The opportunity costs for the trainer would be ($20.10/hr. – $13.50/hr.) x .25 or $1.65/hr. In this case, the trainer’s performance level of 75% during the training period is taken into consideration.

The hidden costs for the new employee and the trainer would then be

- New employee: $12.85/hr. x 20 hrs. = $257
- Trainer: $1.65/hr. x 20 hrs. = $33
- Total hidden costs = $290

The hidden costs for employees who have already been trained are calculated in a similar manner. In this case, information on the skill levels of existing employees is required. The hidden cost formula for employees who have already been trained is:

\[
\text{Hidden costs} = \left(\text{Value added} - \text{labor cost}\right) \times \text{performance level} \times \text{hours worked}
\]

Skill levels can be obtained from production records that illustrate the employee’s performance against standards. Consider the case of three employees.

<table>
<thead>
<tr>
<th>Performance</th>
<th>Pay rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee A: 70%</td>
<td>$8.20/hr.</td>
</tr>
<tr>
<td>Employee B: 85%</td>
<td>$8.40/hr.</td>
</tr>
<tr>
<td>Employee C: 105%</td>
<td>$12.10/hr.</td>
</tr>
</tbody>
</table>
The weekly hidden costs for the 3 employees would be calculated as

Employee A: Hidden costs/wk. = \[\$20.10/\text{hr.} - \$8.20/\text{hr.}\] \times 0.30 \times 40 \text{ hrs./week} = \$142.80/\text{wk.}

Employee B: Hidden costs/wk. = \[\$20.10/\text{hr.} - \$8.40/\text{hr.}\] \times 0.15 \times 40 \text{ hrs./wk} = \$70.20/\text{wk.}

Employee C: Hidden costs/wk. = 0

For employee C, there are no hidden costs since the employee is working above the standard performance level.

**Linking Training Investment with Hidden Costs**

Hidden costs are influenced by training. Consider the hidden costs associated with the training period. Hidden costs can be reduced using two strategies.

1. Reduce the time for an employee to achieve a trained status.
2. Reduce the opportunity costs associated with the trainer.

Suppose that the company invested in a structured job-training process that accelerated job learning and required less involvement of a senior employee. Estimates indicate that the employee can be trained in two days: one day with senior employee supervision and one day with the structured job-training materials. The hidden costs for training would be

\[
\begin{align*}
\text{New employee} & : \ 12.85 \times 16 \text{ hrs.} = \$205.60 \\
\text{Trainer} & : \ 1.65 \times 8 \text{ hrs.} = \$13.20 \\
\end{align*}
\]

\[
\text{Total} = \$218.80
\]

The savings in hidden costs would be \$290.00 - \$218.20 = \$71.80

This cost is \$1500 to develop the structured job-training materials, the company would recover its investment after training 21 employees (\$1500/\$71.80/employee).

Clearly, hidden costs are greater with employees who are experienced but have yet to achieve full performance. Consider an organized training program that would train employees who are at 70\% of the standard performance level. Such a program might involve a diagnosis of skill deficiencies followed by additional training to develop skills. Suppose the company has 45 employees who are at the 70\% skill level, and it is believed that at least 40 of them will be able to achieve full performance levels using the training program. The hidden cost savings per week will be \$142.80/wk. \times 40 \text{ employees} = \$5,712/wk. If the additional skill development requires an investment in a full-time skill trainer whose salary is \$35,000/year, then the skill improvement/development program will pay for itself after only 6 weeks.
A Case Study

The hidden cost methodology was applied at a small manufacturing enterprise that fabricates metal components for both the heavy equipment and mining industries. The facility contains machinery, welding, and plating components. There are 221 hourly employees and 35 salaried staff.

Data were collected on the workforce as shown in exhibit A. This information represents one year of employee data.

Exhibit A
Workforce Data

<table>
<thead>
<tr>
<th>Number of employee job moves during the past year and the average wage rate</th>
<th>112 employees $9.96/hr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of new hires staying with the company and the average starting wage rate</td>
<td>40 employees $7.70/hr.</td>
</tr>
<tr>
<td>Number of new hires who left during the probation period</td>
<td>17 employees</td>
</tr>
<tr>
<td>Time required to learn a job</td>
<td>Trainee time 20 hours 10 hours</td>
</tr>
<tr>
<td>• Existing employee-job move</td>
<td>40 hours 30 hours</td>
</tr>
<tr>
<td>• New hire</td>
<td></td>
</tr>
<tr>
<td>Current skill profile</td>
<td>No. of employees Pay level</td>
</tr>
<tr>
<td>• Highly skilled – at or above standard performance</td>
<td>51 $10.92/hr.</td>
</tr>
<tr>
<td>• Adequately skilled – 90% standard performance</td>
<td>115 $10.07/hr.</td>
</tr>
<tr>
<td>• Inadequately skilled – 75% standard performance</td>
<td>55 $ 7.70/hr.</td>
</tr>
<tr>
<td>Total employees</td>
<td>221 employees</td>
</tr>
<tr>
<td>Value added/employee hour</td>
<td>$21.62/hr.</td>
</tr>
</tbody>
</table>

Training is provided by a senior employee earning $10.98/hour. During the training period, the senior employee works at 60% of the standard performance level. The hidden cost calculations for the training period are shown in exhibits B and C.
Exhibit B
Training period costs—trainees

<table>
<thead>
<tr>
<th>Category</th>
<th>Calculation</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing employees</td>
<td>112 employees x ($21.62/hr. - $9.96/hr.) x 20 hours = $26,118</td>
<td></td>
</tr>
<tr>
<td>New hires</td>
<td>40 employees x ($21.62/hr. - $7.70/hr.) x 40 hours = $22,272</td>
<td></td>
</tr>
<tr>
<td>Terminations</td>
<td>17 employees x ($21.62/hr. - $7.70/hr.) x 40 hours = $9,466</td>
<td>$57,856</td>
</tr>
</tbody>
</table>

Exhibit C
Training period costs—trainers

<table>
<thead>
<tr>
<th>Category</th>
<th>Calculation</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing employees</td>
<td>112 employees x ($21.62/hr. - $10.98/hr.) x 10 hrs. x .40 = $4,767</td>
<td></td>
</tr>
<tr>
<td>New hires</td>
<td>40 employees x ($21.62/hr. - $10.98/hr.) x 30 hrs. x .40 = $5,107</td>
<td></td>
</tr>
<tr>
<td>Terminations</td>
<td>17 employees x ($21.62/hr. - $10.98/hr.) x 30 hrs. x .40 = $2,171</td>
<td>$12,045</td>
</tr>
</tbody>
</table>

The costs for skill deficiencies were also calculated as shown in exhibit D.

Exhibit D
Skill Deficiency Costs

<table>
<thead>
<tr>
<th>Category</th>
<th>Calculation</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adequately skilled</td>
<td>115 employees x ($21.62/hr. - $10.07/hr.) x .10 x 40 hrs./wk. = $5,313/wk.</td>
<td></td>
</tr>
<tr>
<td>Inadequately skilled</td>
<td>55 employees x ($21.62/hr. - $7.70/hr.) x .25 x 40 hrs./wk. = $7,656/wk.</td>
<td></td>
</tr>
</tbody>
</table>

The company undertook a major alteration in its employee development processes. A structured job-training process was developed that provided new employees and employees moving into new positions with more guidance on the jobs they were required to do. The cost of this training process was estimated to be $171,800.

The payback on this investment was analyzed from several dimensions. Since training period costs were modest in comparison to skill deficiency costs, the payback analysis focused on skill deficiency. Presumably, the greatest impact of the skill improvement program was among the inadequately skilled employees. For these employees, the structured job-training program seemed most likely to increase job skills to an adequate
performance level (75% → 90%). The company examined how many employees would be required to advance their skills over a one year period to recover the investment.

The payback period was calculated to be:

\[
\text{Annual savings/employee} = [\$21.62/\text{hr.} - \$7.70/\text{hr.}] \times 0.15 \times 2,000 \\
\text{hrs./yr.} = \$4,176/\text{employee}
\]

Payback = \$171,800/\$4,176/\text{employee} = 41 \text{ employees}

Another procedure for examining the payback period was to determine how long it would take to recover the investment assuming that all of the adequately skilled employees had advanced their skills to at least the 100% performance level.

Payback = \$171,800/\$5,313/wk. = 32 weeks

The final procedure for examining the payback period was to determine the investment recovery if half of the employees in the adequately skilled category were to advance their skills to the 100% level and half of the employees in the inadequately skilled category advanced to the adequately skilled category.

\[
\text{Savings (90% → 100%)} = 57 \text{ employees} \times (\$21.62/\text{hr.} - \$10.07/\text{hr.}) \times 0.10 \times 40 \text{ hrs./wk.} = \$2,633/\text{wk.}
\]

\[
\text{Savings (75% → 90%)} = 27 \text{ employees} \times (\$21.62/\text{hr.} - \$7.70/\text{hr.}) \times 0.15 \times 40 \text{ hrs./wk.} = \$2,255/\text{wk.}
\]

Total savings = \$4,888/wk.

Payback = \$171,800/\$4,888/wk. = 35 weeks

In all three cases, the payback analysis points to a recovery of the investment that can be achieved with modest improvements in skill performance. While there cannot be any guarantees that any training can lead to an investment recovery, the business case for the skill development was strong enough for the employer to make the investment.

* 0.15 represents the gain in proficiency due to the training.

**Summary**

Until training is considered to be a business investment that is recovered with improvements in actual business performance, training will be treated as an expense that can be reduced when business conditions are in decline. This paper describes how training can be linked to business performance.
Authors

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