A BREAK-IN TRAINING
STRATEGY ANALYSIS MODEL

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Introduction

One of the obstacles in workforce development is the justification of expenditures for break-in training. Businesses clearly understand the costs of break-in training. However, they lack an efficient method for documenting the consequences associated with inadequate break-in training.

In this paper, we will examine how to measure the consequences of inadequate break-in training. A case study will also be presented.

Consequences of Inadequate Break-In Training

Every job requires a period of time to acquire the skills needed for the job. The typical break-in training process utilized by employers is best described as observe-and-do. Employees are trained by another employee or by a supervisor. The training is often “on-the-fly.” The trainer has other duties and can only devote part of his/her time to the employee being trained. The employee is observing the job in real time, and not necessarily in the most appropriate sequence of job tasks for learning. After a short observation period the employee is required to perform the job whether or not the job has been learned sufficiently.

It is fairly easy to conceptualize these consequences of such a break-in training process:

- Inability of the employee to generate the value expected
- Product or service quality problems
- Loss of confidence
- Excessive turnover

While these costs are easy to conceptualize, they are hard to measure. Because the consequences of inadequate break-in training are difficult to measure, they are assessed differently than the costs of break-in training. As a result, very limited thought is given to improving the process.

A Case Study

The case study involves a manufacturer of custom-made clothes. In one division of the company, t-shirts and sweat shirts are printed with names and scenes from different small towns. These clothing items are sold in grocery stores, gift shops and similar retail outlets.

The manufacturer utilizes an internal sales staff to call stores and take orders. The sales staff has significant turnover with some employees staying on-the-job less than two weeks. The company uses a mentor to train employees but very few skills are imparted in the training. Because so many employees leave the job quickly, the company is reluctant to invest in an improvement of its break-in training process.
Measuring the Consequences of Inadequate Break-In Training

The consequences of inadequate break-in training can be broken down into the following categories:

- Loss in value generated
- Costs incurred by excessive turnover
- Costs related to quality
- Consequences related to safety problems

The measurement of the consequences in each of these categories is based on comparisons to standards. These measurements are explored below in more depth.

**Loss in Value Generated** — Employees, regardless of the nature of their job, are hired to generate value. Employees in manufacturing add value to the product while employees in service add value to the customer. The value generated is measured as follows:

\[ V_{loss} = \sum_{wk=1}^{n} (V_{standard} - V_{achieved/wk}) \]

Where

- \( V_{loss} \) = Value lost during break-in period.
- \( V_{standard} \) = Value generated by an employee who is fully skilled.
- \( V_{achieved/wk} \) = Value generated by the employee during each week of the training period.
- \( n \) = the number of weeks for the employee to become fully skilled

In the case study, the sales per employee were determined by reviewing company records. The sales curve shown in exhibit A is based on two years of sales data for new hires. The x-axis (week of employment) represents each week since employment.

**EXHIBIT A**

**Value Generated During Break-Even Period**
The sales curve revealed that two distinct sales periods existed during the break-even time period. These 2 distinct sales periods exist because a new employee only works with new customers, who are harder to get but easier to support for the first eight weeks. At the end of the break-even time period, the new employee begins working with existing customers. It was determined, from the results shown in the graph of exhibit A, that the average number of sales/week in the first 8 weeks was 7 and the average number of sales/week for weeks 9-18 was 20. The dollar value of each sale was $250 and the profit margin per sale was 7.5%. Using these averages the value loss can be calculated as follows:

\[
V_{loss} = \sum_{wk=1}^{n} (V_{standard} - V_{achieved}/wk)
\]

For weeks 1-8

\[
V_{standard} = 30 \text{ sales/wk} \times \$250/\text{sale} \times 0.075
\]

\[= \$562.50\]

\[
V_{achieved} = 7 \text{ sales/wk} \times \$250/\text{sale} \times 0.075
\]

\[= \$131.25\]

\[
V_{loss} = 8 \times (\$562.50 - \$131.25)
\]

\[= \$3,450/\text{employee}\]

For weeks 9-18

\[
V_{achieved} = 20 \text{ sales/wk} \times \$250/\text{sale} \times 0.075
\]

\[= \$375.00\]

\[
V_{loss} = 10 \times (\$562.50 - \$375.00)
\]

\[= \$1,875/\text{employee}\]

Total value loss = $3,450 + 1,875 = $5,325/employee

This figure is actually an understatement since many employees do not complete the entire break-in period. For those employees who do not complete the 18 week period, the value loss will be even greater.

For each new employee hired that completed the full 18 weeks break-in period, the total value loss during the break-in period was $5,325. This cost figure relates directly to the value loss associated with excessive turnover.
Cost of Excessive Turnover — The cost of excessive turnover compares the turnover rate of a business with turnover rates that are common in the industry. The formula for calculating this cost is shown below.

\[
\text{Cost}_{\text{Turnover}} = (T_{\text{actual}} - T_{\text{standard}}) * E * (V_{\text{loss}} + H)
\]

Where

- \( \text{Cost}_{\text{Turnover}} \) = The total cost associated with turnover
- \( T_{\text{actual}} \) = The fraction of the workforce that is turned over each year
- \( E \) = The number of employees in the business
- \( V_{\text{loss}} \) = The value lost during the turnover period
- \( H \) = The costs associated with hiring an employee

In the case study, the turnover rate equaled 1.38 illustrates that the entire workforce is turned over in less than one year. The turnover rate for the industry was found to equal .85. The company has 24 employees and the hiring costs were estimated to be $260/employee. The turnover costs are calculated to be:

\[
\text{Cost}_{\text{Turnover}} = (1.38 - .85) * 24 * (5,325 + 260)
\]
\[
= 71,041
\]

Costs Related to Quality — Employees who have yet to acquire the job skills they need can also cost the employer. The formula for this cost is shown below:

\[
\text{Cost}_{\text{Q}} = (\text{ER}_{\text{Standard}} - \text{ER}_{\text{Actual}}) * \text{C}_{\text{ER}} * O
\]

Where

- \( \text{ER}_{\text{Standard}} \) = The error rate for a fully skilled employee
- \( \text{ER}_{\text{Actual}} \) = The error rate for an employee during the break-in period
- \( \text{C}_{\text{ER}} \) = The average cost for each error
- \( O \) = Orders processed during the break-in period
For the case study, quality errors were associated with ordering errors. Correcting errors incurs extra transportation costs. The cost for errors was estimated to be $18 per occurrence. The employee processed 236 orders during the break-in period. The error rate during the break-in period was 7% compared with 2% for fully skilled employees. The quality per employee was estimated to be

\[
\text{Cost} = (\text{ER}_{\text{Standard}} - \text{ER}_{\text{Actual}}) \times C_{ER} \times O
\]

\[
= (.07 - .02) \times 18 \times 236
\]

\[
= 212.40/\text{employee}
\]

The number of employees must be factored into these costs. The employees involved comes from the turnover calculation.

\[
(\text{T}_{\text{Actual}} - \text{T}_{\text{Standard}}) \times E = 12.72
\]

Therefore total cost of quality would be $2,702 (i.e., 212.40 x 12.72).

Consequences Related to Safety Problems — The safety consequences of new employees are more difficult to assess in quantitative terms. However, reviewing accident records to determine the number of accidents that occurred during the break-even period for an employee is one way to assess safety consequences. It should be noted that these accidents may not only involve the new employee but may also involve an accident to another employee from a hazard created by the new employee.

Perhaps the more serious safety consequences of inadequate break-in training are the accidents that could occur. A hazard analysis can reveal the possibility of such accidents. The severity of these accidents can point to specific break-in training requirements.

Justification of Break-In Training Improvements

The cost/consequence analysis can be an effective way to improve break-in training. The process for using this analysis is as follows:

Step 1. Evaluate what improvements can be made with break-in training to achieve the following:

- Option A. A reduction in the time required to become fully skilled.
- Option B. An increase in value generated during the break-in period
- Option C. The reduction of turnover as a result of better break-in training through the use of Option (A)
- Option D. A reduction in errors through training focused on problems that are most prevalent
Step 2. Conduct an analysis of the cost/consequences for improvements in break-in training.

Step 3. Compare the results of the ‘what-if’ analysis to the costs of making the improvements.

Step 4. Rank order the improvements to assess the improvements which offer the greatest impact.

This process was applied for the case study. Details of this analysis are as follows:

Step 1. Improvement evaluation

Option A. Time required to become fully skilled can be reduced to 14 weeks by utilizing a training manual that focuses on selling techniques. [7 sales/wk (wks 1-7), 20 sales/wk (wks 8-14)]

Option B. The value generated can be improved with simulation of sales calls and realignment of initial call responsibilities.
- Sales (Phase I training period: week 1-8) = 10
- Sales (Phase II training period: week 9-18) = 25

Option C. Turnover reduction due to lack of job confidence resulting from Option (A) is estimated to be 30% (from 1.38 to 1.08). A skills bonus of $1,000 will be offered to employees who reach 25 sales per week by week 14. This should bring down turnover by another 20%.

Option D. Improved training will reduce errors from 7% to 4% based upon typical errors made by previous trainees.

Step 2. The cost consequences of each improvement possibility are shown below. Option (A) has an impact on value loss, turnover, and quality. The impact of option (A) is shown below:

Option A

\[ V_{loss} = \sum_{wk=1}^{n} (V_{standard} - V_{achieved}/wk) \]

\[ V_{standard} = 30 \text{sales/wk} \times \$250/\text{sales} \times 0.075 = \$562.50/\text{wk} \]

For weeks 1-7

\[ V_{achieved} = 7 \text{sales/wk} \times \$250/\text{sale} \times 0.075 \]

\[ = \$131.25/\text{wk} \]

\[ V_{loss} = 7 \text{wks} \times (\$562.50 - \$131.25) \]

\[ = \$3019/\text{employee} \]
For weeks 8-14

\[
V_{\text{standard}} = \$562.50/\text{wk}
\]

\[
V_{\text{achieved}} = 20 \text{ sales/ wk x } \$250/\text{sales x 0.075} = \$375/\text{wk}
\]

\[
V_{\text{loss}} = 7 \text{ wks x } (\$562.50/\text{wk} - \$375/\text{wk}) = \$1313
\]

The total value loss per employee is $4,332. This compares to a previous figure of $5,325, a savings of $993/employee.

Option B

The improvement resulting from option (B) is shown below:

\[
V_{\text{loss}} = \sum_{wk=1}^{n} (V_{\text{standard}} - V_{\text{achieved}/\text{wk}})
\]

\[
V_{\text{standard}} = \$562.50/\text{wk} (\text{see previous section})
\]

For weeks 1-8

\[
V_{\text{achieved}} = 10 \text{ sales/ wk x } \$250/\text{sale x 0.075} = \$187.50
\]

\[
V_{\text{loss}} = 8 \text{ wks x } (\$562.50/\text{wk} - \$187.50/\text{wk}) = \$3,000
\]

For weeks 9-18

\[
V_{\text{achieved}} = 25 \text{ sales/ wk x } \$250/\text{sale x 0.075} = \$468.75/\text{wk}
\]

\[
V_{\text{loss}} = 18 \text{ wks x } (\$562.50/\text{wk} - \$468.75/\text{wk}) = \$1,688.00
\]

The total loss for option (B) is $3,000 + $1,688 or a savings of $637 per employee
Option C

The improvement resulting from option (C) comes in two parts

- Turnover reduction from options (A) and (B)
- Turnover reduction from bonus payment

The impact of reducing turnover resulting from options (A) and (B) will be

\[ \text{Cost}_{\text{Turnaround}} = (1.08 - .85) \times 24 \times (4,332 + 260) \]

\[ \text{Cost}_{\text{Turnaround}} = 25,348 \]

The cost represents a savings of $45,693 from the original turnaround costs. With a turnover rate of 1.08, there would be 27 employees retained for a cost savings of $1,692/employee.

The combined impact of reducing turnover resulting from the $1,000 bonus and from options (A) is:

\[ \text{Cost}_{\text{Turnaround}} = (.88 - .85) \times 24 \times (4,332 + 260) \]

\[ = 3306 \]

The savings in turnaround costs from the previous figure of $25,348 is $22,042 for 21 employees. Finally, the impact of reducing the error rate will be

Option D

\[ \text{Cost}_Q = (.04 - .02) \times 18 \times 236 \]

\[ = 85/\text{employee} \]

The number of employees impacted will be based on the original turnover calculation (12.72). Therefore, the cost impact of quality improvements will be $1,081 (85 x 12.72).

Step 3. The savings from achieving the improvements are compared to the costs of achieving these improvements. The savings/cost comparisons are shown in exhibit B.
### EXHIBIT B

**SAVINGS/COST COMPARISONS**

<table>
<thead>
<tr>
<th>Option</th>
<th>Improvements</th>
<th>Efforts Required</th>
<th>Costs to Achieve Improvement</th>
<th>Financial Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Reduction in time to become fully skilled</td>
<td>Development in training materials and skilled trainers</td>
<td>$5,000 + $500/employee</td>
<td>$993/employee</td>
</tr>
<tr>
<td>B</td>
<td>Increase in value during break-in period</td>
<td>Sales skills training</td>
<td>$200/employee</td>
<td>$637/employee</td>
</tr>
<tr>
<td>C</td>
<td>Turnover reduction</td>
<td>Bonus payment</td>
<td>$1,000/employee</td>
<td>$1,692/employee</td>
</tr>
<tr>
<td>D</td>
<td>Error reduction</td>
<td>See (a) above</td>
<td>No additional cost</td>
<td>$85/year</td>
</tr>
</tbody>
</table>

Step 4. The rank ordering of improvements for the case study illustrates that two actions are particularly profitable. These are to increase value during the break-in period and to reduce the time required to complete the break-in period. Since these two actions also result in improvements in turnover and in quality, the financial savings has a multiplier effect.

### Using the Break-In Analysis Model

The break-in analysis model presented here offers organizations a structured approach to the development of cost-effective break-in strategies. Some of the key questions the break-in analysis model helps to answer are:

- **How much is it really costing us when we break-in an employee on a new job?** Often the value loss is much more than the more apparent costs of the employee’s salary?
- **What would we save if we could accelerate the break-in training?** The answer to this question should be driven by the time required for skills to be achieved, not by the employee’s wages.
- **How does the break-in training impact job turnover rate?** High turnover results in very significant loss of value and may be the most important break-in training design issue for some employers?
- **What impact does break-in training have on quality costs and accidents?** Targeted investments on training can often lead to major cost avoidance?
- **What impact does job candidate screening have on the break-in process?** Modest investments in candidate screening can result in significant savings.
These questions and others can be answered with the break-in analysis model. By focusing on the value earned rather than training costs, the employer can render break-in training much more productive.

**Summary**

Break-even training costs are rarely considered as a part of an organization’s cost improvement strategy. As this paper has shown, break-even costs can be significant. The methodology outlined here can be used to estimate how much new employees actually cost an employer.

**Author**

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