Bridging the Gap between Spreadsheet Use and Control: An Instructional Case

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ABSTRACT: End user applications (such as spreadsheets) have been cited as a previously ignored yet potentially significant risk to financial reporting in the wake of The Sarbanes-Oxley Act (PricewaterhouseCoopers [PwC] 2004; Ernst&Young [E&Y] 2004). We developed a realistic spreadsheet model in order to expose students to internal control issues inherent in a spreadsheet environment. By completing the case, students develop skills relating to auditing information systems and evaluating spreadsheet controls, functions, and formulas. Students also have an opportunity to improve written communication skills by conveying their findings to others in a memorandum.

I. INTRODUCTION

Spreadsheet control and accuracy are receiving more attention with the focus on financial reporting controls under The Sarbanes-Oxley Act (U.S. House of Representatives 2002). Client advisory documents concerning Section 404 compliance cite end user applications (such as spreadsheets) as a previously ignored yet significant threat to financial reporting (PwC 2004; E&Y 2004). It appears that a gap exists between the degree of reliance on spreadsheets and the control over spreadsheets. This problem-based learning case requires students to test the effectiveness of a realistic, complex spreadsheet environment. Case learning objectives include increasing students’ abilities to enumerate application and general controls in a spreadsheet environment, improving students’ abilities to recognize spreadsheet errors, and allowing students an opportunity to recommend solutions to both control problems and errors detected through the course of their audit.

Spreadsheets are an integral part of many companies’ financial management and reporting processes (Durfee 2004). Companies use spreadsheets to support financial reporting in a multitude of ways. A spreadsheet application may be calculating a dollar amount for a journal entry (such as the allowance for uncollectible accounts), or it may be holding the supporting records for a journal entry or ledger account balance (such as the aging of accounts receivable at a point in time). Spreadsheets also may help companies consolidate subsidiaries’ financial data into the consolidated financial statements. These are only a few examples of how companies are using spreadsheets to support financial accounting and reporting.

1 Following the first round of integrated audits, some companies asked the PCAOB for additional guidance on the evaluation of spreadsheets in the financial reporting process (see, for example, Smith 2005).
Surprisingly, many companies that use spreadsheets in financial reporting have primary accounting software, such as an enterprise resource planning (ERP) system. What may begin as a “temporary” solution—a spreadsheet for a quick calculation—evolves into a key part of the company’s financial reporting system, relied upon each time the calculation is needed (Baxter 2006). Furthermore, corporate accountants often are more familiar with using Excel® to perform a calculation than their ERP or other accounting package (which might require queries and a report-writer to achieve the same calculation). As an informal or ad hoc solution, spreadsheets are seldom subject to the same control rigor as formal software applications. Compounding this issue is the fact that spreadsheets are error-prone and spreadsheet “developers” are often overconfident in their spreadsheet-produced results (Panko 2005).

In the case of Vintage Wineries, students encounter a publicly traded client that uses spreadsheets to support its financial reporting process. Students must consider the company’s policies regarding the development and use of spreadsheets. Furthermore, they must “audit” one of the client’s financial reporting spreadsheet applications concerning fixed assets and depreciation.

II. THE CASE OF VINTAGE WINERIES

You work as an associate for a PCAOB-registered public accounting firm. You are assigned to the Vintage Wineries (VW) audit engagement for the year-ended December 31, 2007. As part of the firm’s integrated audit of VW, you have the task of evaluating the controls surrounding VW’s use of spreadsheet models in its financial reporting process. These spreadsheet models determine the dollar amounts of certain journal entries relating to VW’s fixed assets, accumulated depreciation, and depreciation expense. VW has multiple spreadsheet models outside of its core accounting software, which was implemented in late 2003. While the new software is capable of handling most of the calculations performed by VW’s custom spreadsheet models, the accounting personnel have yet to find the time to transfer the data over to the new software. Preparing documentation for Section 404 compliance during this same period has consumed a majority of their time.

Company Background

The story of Vintage Wineries began in late 1999 as a vision of the Leonolli family. The first winery opened in January 2000 in Napa and proved to be successful. In 2002, the Leonolli family seized a window of opportunity to take the company public. Using the proceeds from the public offering, VW opened two more wineries in the nearby towns of Yountville and Calistoga. Today, Vintage Wineries is recognized for outstanding quality and has earned an impressive number of awards.

Diana Marcello, the company’s controller, heads the accounting department. Ben Wakeford, the assistant controller, and five staff accountants report to her. Diana is the first and only controller of VW. She personally hired each of her staff members, including Ben, who has been with VW since 2002. Diana reports to the company’s Chief Financial Officer, Leo Leonolli. Over seven years of auditing VW, your firm has developed an excellent relationship with VW’s accounting staff.

Working through the initial public offering with VW provided your firm with a deep understanding of VW’s financial reporting process. Management has generally implemented improvements suggested by your firm at the close of each audit. One exception is the continued use of custom-developed spreadsheet models for the preparation of certain significant journal entries. The ad hoc spreadsheet models were developed prior to 2003, when the company was using a very simplistic accounting software package. Diana, a proficient
spreadsheet user, felt more confident in results provided by her spreadsheets than those
generated by the accounting software. She felt she did not know “how the software was
working.” Though Diana has agreed that the new accounting software could reliably pro-
duce the journal entry amounts, she and her staff have not had the time to transfer years’
worth of data into the new software and implement those software modules, and do not foresee
having the time to do so in the near future. In her words, “It’s just easier and quicker to pull
the amounts from the spreadsheets that we’ve always used ... and I know they’re right!”

Depreciation Model

One spreadsheet model in particular, used to calculate depreciation, has kept your
attention. It is more complex than others you have evaluated during the VW audit. The
model consists of a group of linked Excel files. The base file provides a reference for the
depreciation method and useful life for all depreciable assets (see VW Dep Methods.xls).
Five additional Excel files, one for each asset class, contain depreciation records for the
individual assets and reference the base file to determine the appropriate method and useful
life for each asset (see VW Dep Sch [Admin].xls, VW Dep Sch [Bottling].xls, VW Dep Sch [Buildings].xls, VW Dep Sch [Cellar].xls, and VW Dep Sch [Crush].xls). Each of these
depreciation workbooks contains multiple worksheets, as there are many individual assets
in each asset class. A final workbook computes a period depreciation total by referencing
the five depreciation record workbooks (see VW Dep Totals.xls).

In preparation for this engagement, the engagement senior asked Vintage Wineries for
documentation regarding the depreciation spreadsheets. Diana Marcello provided several
items regarding the structure of the model. Table 1 is a complete inventory of the workbooks
and worksheets within the workbooks. Figure 2 illustrates the structure of the complete
<table>
<thead>
<tr>
<th>Workbook</th>
<th>Brief Description</th>
<th>Worksheets</th>
</tr>
</thead>
<tbody>
<tr>
<td>VW Dep Methods.xls</td>
<td>Contains information regarding depreciation method and asset life (referred to as the “base file”).</td>
<td>Winery Dep Methods</td>
</tr>
<tr>
<td>VW Dep Sch (Admin).xls</td>
<td>Contains worksheets for all administrative assets such as vehicles and office equipment.</td>
<td>Workbook Contents, Truck 1 (Napa), Truck 2 (Napa), Truck 3 (Calistoga), Truck 4 (Yountville), Car 1 (Napa), Car 2 (Napa), Car 3 (Calistoga), Car 4 (Yountville), Car 5 (Yountville), Car 6 (Napa), Car 7 (Calistoga), Car 8 (Napa), Copier (Napa), Copier (Calistoga), Copier (Yountville), IBM Server (Napa), POS 1 (Napa), POS 2 (Napa), POS 3 (Napa), POS (Calistoga), POS (Yountville), Desks (Napa), Conf Table (Napa), Desks (Calistoga), Office Seating (Calistoga), Desks (Yountville), Office Seating (Yountville)</td>
</tr>
<tr>
<td>VW Dep Sch (Bottling).xls</td>
<td>Contains worksheets for all assets used in the bottling process.</td>
<td>Workbook Contents, Bottle Washer (Napa), Bottling Tanks (Napa), Bottling Corker (Napa), Bottling Foiler (Napa), Bottling Labeler (Napa), Bottling Spinner (Napa), Bottle Washer (Calistoga), Bottling Tanks (Calistoga), Bottling Corker (Calistoga), Bottling Foiler (Calistoga), Bottling Labeler (Calistoga), Bottling Spinner (Calistoga), Bottle Washer (Yountville), Bottling Tanks (Yountville), Bottling Corker (Yountville), Bottling Foiler (Yountville), Bottling Labeler (Yountville), Bottling Spinner (Yountville)</td>
</tr>
<tr>
<td>VW Dep Sch (Buildings).xls</td>
<td>Contains worksheets for all buildings.</td>
<td>Workbook Contents, Arpel (Napa), Avignon (Napa), Bordeaux (Napa), Chavenay (Napa), Lille (Yountville), Marseilles (Calistoga), Metz (Napa), Nior (Napa) Lille (Yountville), Marseilles (Calistoga), Voiron (Napa)</td>
</tr>
</tbody>
</table>

(continued on next page)
<table>
<thead>
<tr>
<th>Workbook</th>
<th>Description</th>
<th>Contains</th>
<th>Contains Worksheets and Calculates Total Depreciation Expense by Month.</th>
</tr>
</thead>
<tbody>
<tr>
<td>VW Dep Sch (Cellar).xls</td>
<td>Contains worksheets for all assets used in the aging process.</td>
<td>Workbook Contents, Aging Bins (Napa), pH Meter 1 (Napa), pH Meter 2 (Napa), pH Meter 3 (Napa), Pump 1 (Napa), Pump 2 (Napa), Pump 3 (Napa), Refrigeration Sys (Napa), Aging Bins (Calistoga), pH Meter 1 (Calistoga), pH Meter 2 (Calistoga), Pump 1 (Calistoga), Pump 2 (Calistoga), Refrigeration Sys (Calistoga), Aging Bins (Yountville), pH Meter (Yountville), Pump (Yountville), Refrigeration Sys (Yountville)</td>
<td>Calculate Deprec for Month, Administrative Assets Breakdown, Bottling Assets Breakdown, Building Assets Breakdown, Cellar Assets Breakdown, Crush Assets Breakdown</td>
</tr>
<tr>
<td>VW Dep Sch (Crush).xls</td>
<td>Contains worksheets for all assets used in the extraction process.</td>
<td>Workbook Contents, Centrifuge 1 (Napa), Centrifuge 2 (Napa), Fermentation Tank 1 (Napa), Fermentation Tank 2 (Napa), Fermentation Tank 3 (Napa), Hopper (Napa), Must Chiller (Napa), Press 1 (Napa), Press 2 (Napa), Scale 1 (Napa), Scale 2 (Napa), Scale 3 (Napa), Centrifuge (Calistoga), Fermentation Tank (Calistoga), Hopper (Calistoga), Must Chiller (Calistoga), Press (Calistoga), Scale (Calistoga), Centrifuge (Yountville), Fermentation Tank (Yountville), Hopper (Yountville), Must Chiller (Yountville), Press (Yountville), Scale (Yountville)</td>
<td></td>
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<tr>
<td>VW Dep Totals.xls</td>
<td>Contains summary worksheets and calculates total depreciation expense by month.</td>
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FIGURE 2
Workbooks in the Spreadsheet Application
(Prepared by Client)

VW Dep Methods.xls

The VW Dep Sch worksheets reference the VW Dep Methods worksheet for "method" and "estimated useful life." See Figure 3 for additional details on the VW Dep Sch workbook.

VW Dep Sch (Admin).xls

The VW Dep Totals workbook references the VW Dep Sch workbooks for depreciation on each asset. For example, the worksheet "Administrative Assets Breakdown" (in VW Dep Totals) sums depreciation from all worksheets in VW Dep Sch (Admin). The "Calculate Depreciation for Month" worksheet in VW Dep Totals then sums the depreciation totals from its worksheets. See Figure 4 for additional details on the VW Dep Totals workbook.

VW Dep Totals.xls

Other workbooks organized like this one: VW Dep Sch (Bottling).xls, VW Dep Sch (Buildings).xls, VW Dep Sch (Cellar).xls, and VW Dep Sch (Crush).xls.
spreadsheet application, particularly how the workbooks are linked. Figure 3 provides the structure of the asset depreciation schedule template (which is the worksheet used to calculate depreciation for each individual asset) and identifies which data are manually entered.

**FIGURE 3**

*Design of the Depreciation Schedule (VW Dep Sch) Worksheets (Prepared by Client)*

Data manually entered for each asset.

Lookup functions find the asset class in the *VW Dep Method* workbook and retrieve method and estimated useful life.

Amounts are automatically calculated using data in C2:C11.

Current Depreciation, Accumulated Depreciation, and Net BV of Asset are automatically calculated using formulas and functions.

The initial date (A17) references the acquisition date (C6); remaining dates are filled down the column.

When a new asset is acquired, a new worksheet is added to the appropriate workbook (asset class). A link to the new worksheet is placed on the *Workbook Contents* worksheet.
and which are automatically calculated. Finally, Figure 4 provides an overview of the depreciation totals workbook.

Diana developed the spreadsheet model shortly after the company’s inception. Since the company closes the books each month, and thus records depreciation each month, she determined that developing a spreadsheet to compute the recurring monthly amount would be a good use of her time. Diana developed the spreadsheet with the idea that it could be easily appended with new worksheets for additional assets that VW would acquire.

The spreadsheets are stored on a server within the accounting department, along with other financial accounting spreadsheets and data stores. Everyone on the accounting staff has access to the spreadsheets; however, only Ben and Diana access them regularly. Staff accountants have no reason to use the spreadsheets unless specifically instructed to do so by Diana. Ben typically accesses the spreadsheets to update worksheets with current data. However, Diana insists that she make any necessary changes to the structure of the model or add new worksheets (such as for new assets) when necessary.

III. REQUIREMENTS

Recall that your assigned task is to evaluate the controls surrounding VW’s use of spreadsheet models in its financial reporting process. Based upon the information provided in the case and reasonable inferences, prepare a memorandum to your project senior addressing the following concerns:

- General controls over the company’s use of spreadsheets in its financial reporting process, including the risk(s) mitigated by the controls. Be sure to consider controls that are currently present (strengths) as well as those that should be present but are not (weaknesses). (You may assume that other spreadsheets used in VW’s financial reporting process are used in a manner similar to the depreciation spreadsheet model.)
- Application controls within the company’s depreciation spreadsheet model, including the risk(s) mitigated by the controls. Be sure to consider controls that are currently present (strengths) as well as those that should be present but are not (weaknesses).
- Errors (or the potential for future errors) that you discovered in the depreciation model. For each error, identify the ramifications of the error remaining unresolved and propose a correction/solution, if possible. It may be helpful to organize the errors identified in a table, such as:

| Error Cell Ref. | Error | Ramification if Unresolved | Potential Correction/Fix |

- Recommendations regarding improvements (both from a control perspective and regarding errors in this specific spreadsheet model). Keep in mind the cost-versus-benefit tradeoff and feasibility.

Your instructor will provide you with the spreadsheet files as well as more specific guidance on the format of the memo. For example, your instructor may direct you to use bulleted lists or a tabular format for certain requirements.

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2 For ease of reference to an error, use the notation Workbook: Worksheet: Cell(s) (for example, “VW Dep Sch [Buildings]: Arpel Wine Storage Cave: A1”).
FIGURE 4
Design of the Depreciation Total (VW Dep Totals) Workbook
(Prepared by Client)

Date is referenced by other worksheets in this workbook (such as Administrative Assets Breakdown) to determine the applicable period for calculating total depreciation.

Totals are automatically calculated based upon the subtotals in the respective rows.

Cells reference other worksheets in this workbook (such as Administrative Assets Breakdown and Bottling Assets Breakdown seen above), used to calculate these totals.