

The Challenge

Many organizations have recurring audits, either over time or over locations, or both. Examples include branch audits, inventory audits, store audits, etc. Often these audits will have narrowly defined objectives, which have evolved over time based upon prior results. Assigned staff may include entry level personnel with limited knowledge and experience. Turnover can also erode the knowledge levels over time.

The challenge is how best to leverage these resources so they can be used in the most efficient and effective manner. This article looks at two approaches, both framed in an Excel environment and both automated to the extent feasible.

Premises and assumptions made

1. The required data analysis and tests which can be automated are essentially the same from review to review
2. Excel is available and audit staff have basic familiarity with its use
3. An audit senior with strong computer skills is available to design and implement the system
4. The audit use over time will be sufficient to justify resources needed to test, implement and train on the system.

Overview of Approach

One or more Excel workbooks will be designed, and correspond with the areas being audited. Each workbook will have an index sheet which provides a brief explanation of the contents and purpose of the remaining sheets in the workbook.

There will be a series of worksheets, intended to be completed in sequential order, which will systematically perform the data analysis, once the data has been collected and imported into the workbook. Where parameters and values need to be specified prior to the analysis being performed, an explanation of the values and their meaning is provided.

The data analysis performed is an automated procedure, which will result in additional worksheets or charts/graphics being developed for review and inclusion in the work papers. The intention is that the person initiating the review does not necessarily need to have a deep understanding of all of the details of the analytic procedure being performed.

(Note: There are two Excel workbooks, several data files, and an MS Access database which provide examples for this article and can be [downloaded](#) in zip format. All of the data, names, etc. in the zip file are fictional.)

Typical Types of Audit Analysis which can be readily automated

Many of the audit procedures and tests performed are readily adaptable to automation. Certain of these procedures and tests will be performed in almost every audit, in one fashion or another. Examples include:

Sampling

- Interval (attribute) sampling
- Dollar unit sampling
- Sample evaluation
- Sample size calculation

Population Attributes

Total Debits and Credits
Transaction Stratification
Top and Bottom 5
Outliers
Summarization
Histograms
Ageing

Often, where data is readily available in electronic format and consists of a large number of records, audit tests will need to be done using data which has been *extracted*. Further analysis on that data will then often involve the *search for exceptions* or unusual items.

Examples of these types of audit procedures can then be broken down into these two groups:

Data Extraction

- Testing for exceptions
- Identifying sub-populations for testing
- Drill down

Identification of possible exceptions

- Benford's Law
- Checking for holiday dates
- Counts by day of week
- "Impossible" transactions (e.g. negative cost)
- Checking for duplicates or gaps in numeric sequences
- Checking for Round Numbers

What are the most common reasons why automation is not more widespread? There are various reasons, including:

1. rarely is the same procedure performed twice
2. lack of staff which can be assigned to automation tasks
3. challenges and resources needed to establish an automation process
4. insufficient perceived benefit

In some cases these reasons justify not using automation. However, each of these reasons should be examined carefully, considering the items below.

Same procedure not performed twice

Although it may be that the same procedure is not performed twice, often there are classes of procedures which are performed again and again. Examples

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include tying transaction details to control accounts, stratifying or classifying transactions, sampling, etc. Typically these types of tests and procedures will be performed during every audit.

Lack of staff which can be assigned to automation tasks

Here the issue often has two aspects – 1) availability of staff with the requisite skill level, and 2) justification of resource expenditure.

A premise of this article is that certain automation tasks can be established by staff without extensive computer skills, providing they have sufficient audit skills and can carefully follow documentation instructions. The justification of resource expenditures requires judgment as to the potential amount of time that can be saved (both field work and review).

Challenges and resources

Insufficient perceived benefit

Operational costs of automation are often minimal – i.e. it becomes feasible to perform a variety of procedures using the computer which could never be justified if they were performed manually, due to the sheer effort required to perform them. To an extent, it is possible to use a “shotgun” approach, wherein a variety of tests are performed, even though many will not necessarily produce any significant

results. Audit tests previously deemed of marginal benefit can now be performed, as often 100% of the population can be subjected to a variety of audit tests,

Example Processes for Automation

To illustrate how a process might be established, a hypothetical audit process will be described, along with the process to implement it. The procedures described here are somewhat rudimentary, but serve to illustrate what might be established.

All the data examples and Excel workbooks are available for download. All of the data, although representative of what might be encountered during an audit, has all been made up, and serves only for the purpose of illustrating how the procedures might be performed.

The audit process to be automated is a store location audit, with some audit coverage in the following areas:

- Payroll
- Fixed Assets
- Revenue
- Journal Entries
- Inventory

Data for each of these areas is available from an enterprise resource planning (ERP) system, which has been extracted into both a flat file and a Microsoft Access database for review by the auditors. The same type of audit analysis and data testing is performed at each store. Below is a highlight of the key audit data analysis steps performed by functional area:

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Payroll

1. Extract all transactions for the current review period (quarter, month, etc)
2. Tie population totals to the trial balance
3. Select a dollar unit sample for detail testing
4. Summarize by department and prepare a schedule of the top 3
5. Summarize by employee and prepare a schedule of the top 5
6. Test all transactions for FICA in excess of designated percentage
7. Stratify the amounts by hours worked

Fixed Assets

1. Extract all acquisitions during the current period, tie to Trial Balance
2. Extract all dispositions during the current period and select an interval sample
3. Test all assets for credit balance
4. Test for depreciation expense on assets which have been fully depreciated
5. Summarize by asset type and prepare a Pareto chart

Revenue

1. Summarize by department and tie to Trial Balance
2. Extract debit transactions and select an interval sample
3. Prepare trends over the last 12 months by department; review for any unusual fluctuations

Journal Entries

1. Verify debits equal credits
2. Summarize by posting account
3. Perform a test of Benford's Law
4. Prepare a schedule of the top 5 account posting amounts
5. Prepare a summary and Pareto chart of JE approvers
6. Prepare a summary and Pareto chart of JE accounts
7. Prepare a schedule of every entry initialed on a federal holiday
8. Prepare a count of Journal entries made by day of week
9. Prepare an analysis of the use of "round numbers"

Inventory

1. Obtain population totals and tie to Trial Balance
2. Prepare a Benford's Law test on inventory counts
3. Summarize inventory counts and values by department
4. Extract all inventory adjustments
5. Perform stratification by inventory unit value

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Implementation

Two workbooks are provided, both are structured the same, i.e.

Lead Sheet named \$Index which describes the contents of the workbook Worksheets for each audit step, organized within audit area

- Payroll sheets are labeled, PR, PR1, PR2, PR3 etc.
- Fixed Assets – labeled FA, FA1, FA2, FA3 etc.
- Revenue – labeled REV, REV1, REV2, REV3 etc.
- Journal Entries – labeled JE, JE1, JE2, JE3 ,etc
- Inventory – labeled INV, INV1, INV2, INV3 etc.

Each worksheet will include any parameters which must be specified and will also describe the output sheet containing the results once the tests are performed.

One workbook (RAPMacro.xls) is based upon Excel macros, and command buttons are included.

The other workbook (RAP.xls) uses commands or groups of commands which are included on the sheet. These commands are used to perform the requested analytical procedure.

The remainder of the workbook will be the worksheets which have been produced by the automation procedure. These will include data and may also contain charts.

Walk Through of Procedure for macro commands

Generally, the procedures performed are very similar to that shown for the commands. The major difference, of course, is that Excel macros need to be coded. The other difference is that the commands to be processed are not entered into the command bar (instead by clicking a command button).

Step1 – Note the name of the Microsoft Access Database containing the payroll transactions and open the Workbook to the macro editor”

Step 2- Enter the name of the Microsoft Access Database and the starting and ending period for the audit into the macro.

Step 3 – Click the “Process” button. This extracts all the transactions to a worksheet named “\$Payroll”. (Note – in this workbook, all generated worksheets are prefixed with a \$ to distinguish them from worksheets with processing instructions, etc.)

Step 4 – Click on the Sheet named \$Payroll, summarize the column for amounts and tie this amount to the Trial Balance.

Step 5 – Click on the Sheet “PR2” and enter the CMA sampling criteria, i.e. the R factor, J factor, and random number starting number.

Step 6 – Click the “Process” button. This performs a CMA sample using the parameters provided and the logic in the

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Excel macro coded in the workbook. Output is to two sheets – “\$PRCMA1” which contains the sample reconciliation and “\$PRCMA2” which contains the transactions selected.

As a note – not all of the command buttons in the Work Book using Excel macros have been linked to executable code, but serve as an illustration of the process.

Walk through of Procedure for Payroll – command procedures

To illustrate how the process could work, the process is shown step by step below:

Step1 – Open the workbook named RAP.xls to the Sheet “LD”. Note the name of the Microsoft Access Database containing the payroll transactions.

Step 2- Enter the name of the Microsoft Access Database and the starting and ending period for the audit.

Step 3 – Assuming the audit command software is installed, copy and paste the command into the toolbar. This extracts all the transactions to a worksheet named “\$Payroll”. (Note – in this workbook, all generated worksheets are prefixed with a \$ to distinguish them from worksheets with processing instructions, etc.)

Step 4 – Click on the Sheet named \$Payroll, summarize the column for amounts and tie this amount to the Trial Balance.

Step 5 – Click on the Sheet “PR2” and enter the CMA sampling criteria, i.e. the R factor, J factor, and random number starting number.

Step 6 – Copy and paste the command into the toolbar. Running the command performs the sample and provides the sample reconciliation report. Output is to two sheets – “Samp Rec” which contains the sample reconciliation and “PR Extract” which contains the transactions selected.

The advantages are that the automation procedure can be established without the need for knowledge of developing and testing Excel macros (also maintenance is simpler).

Summary and Recap

In certain situations, audit automation may be feasible and desirable. There are many alternatives, two of which have been presented here.

About the author:

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Appendix of Example WorkSheet Schedules and Charts

Lead Sheet

1	Sheet Name	Sheet Description		
2	Commands			
3	AllCmd	All the audit commands used for this exercise		
4	Payroll			
5	Payroll Data	The payroll transactions for the year		
6	Current Data	Payroll data for the current period		
7	PR1	Objective 1 - Summarization		
8	PR2	Objective 2 - Summarization by Department		
9	\$PR1	Output for Objective 1		
10	\$PR2	Output for objective 2		
11	Journal Entries			
12	JE Data	Journal entry transactions for the year		
13	JE1	Objective 1 - Summarization		
14	JE2	Objective 2 - Summarization by Account		
15	JE3	Objective 3 - Summarization by Approver		
16	JE4	Objective 4 -		
17	\$JE1	Output for Objective 1		
18	\$JE2	Output for Objective 2		
19	\$JE3	Output for Objective 3		
20	\$JE4	Output for Objective 4		
21	Revenue			
22	Revenue Data	Revenue transactions for the year		
23	REV1	Objective 1 - Summarization		
24	REV2	Objective 2 - Summarization by Account		
25	\$REV1	Output for Objective 1		
26	\$REV2	Output for Objective 2		
27	Fixed Assets			
28	Fixed Asset Data	Fixed Assets Transactions		
29	FA1	Objective 1 - Summarization		
30	FA2	Objective 2 - Summarization by Account		
31	\$FA1	Output for Objective 1		
32	\$FA2	Output for Objective 2		
33	Inventory			
◀ ▶ 🔍 \$Index / AllCmd / PR / LD / \$Log / \$Control / JE Data / Payroll Data / Inventory Data / 🔍				
Ready				

Lead Sheet of the Excel Work Book (named \$Index)

Appendix of Example WorkSheet Schedules and Charts

Payroll Tests Sheet

1		
2		
3		Objective
4		
5		Extract all payroll transactions for the current review period. Tie total payroll expense to the Trial Balance
6		Tie total payroll expense to the Trial Balance.
7		
8		Output from this step is written to sheet named \$PR1
9		
10	1	First step is to extract those records which fall within the current audit period which is the quarter ending 6-30-2007
11	2	Amummarization (control totals)
12	3	Recalculate FICA - first add a column named CALCFICA, recompute FICA at 6.2% (doesn't consider Medicare at 1/45%)
13		To copy commands to the toolbar: lc sheet=PR ulc=b16
14		
15		
16	1	extract ds=rng sheet="Payroll Data" ulc=a1 cond="(\$datepaid >= 4/1/2007) and (\$datepaid < 6/30/2007) " recap="Current Data"
17	2	un ds=rng sheet="Current Data" ulc=a1 col=Gross recap=\$PR1
18	3	calculate ds=rng sheet="Current Data" ulc=a1 col=CalcFICA amount="\$gross *.062"
19		
20		
21		
22		
23		
24		

Ready

Navigation: \$Index / AllCmd / PR / LD / \$Log / \$Control / JE Data / Payroll Data / Inventory Data

Payroll Tests (named PR)

