

Data Analysis & Mining

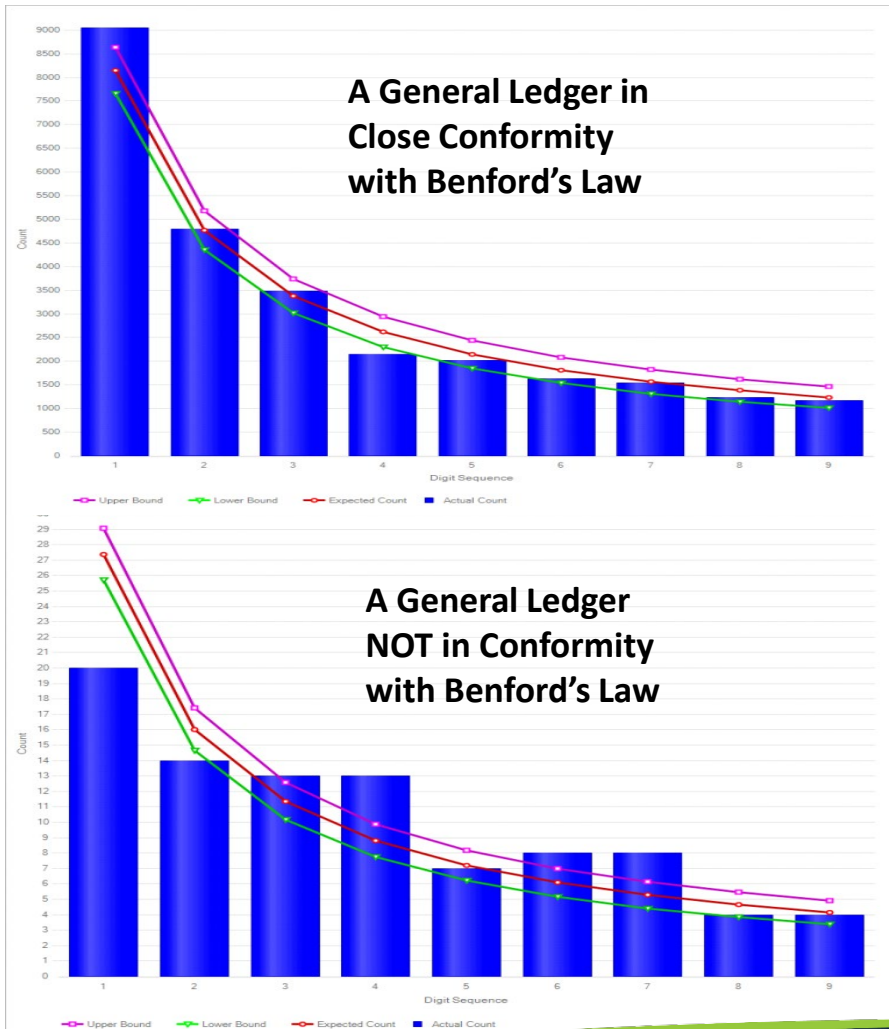
All businesses are vulnerable to fraud. The most recent Association of Certified Fraud Examiners Report to the Nations, which is a global study of fraud, declared that businesses lose 5% of revenues each year to fraud.

One important way a business can detect and sometimes prevent fraud is continuous analysis, mining and scrutiny of certain data of the business. This is where data analytics and HW&Co. can help your business maintain continuous oversight.

Ways to detect fraud and increase oversight:

Benford's Law – this law states that digits and digit sequences in a data set follow a predictable pattern. If this pattern is not followed, more analysis is necessary. In a data set, like a general ledger, the number 1 occurs more often as the first digit and the number 9 occurs the least often as the first digit.

Below is the Benford's Law analysis analyzing the first digit of data in a general ledger (each line on a general ledger representing one item in the population). It is an example of a "close conformity" to Benford's law, meaning the general ledger data is as expected with respect to the occurrence of each number as the first digit:



In the second data set, the digits "4", "6" and "7" occur much more frequently as the first digit in the data than expected, occurring more frequently than "1", "2" & "8".

Transactions starting with the digits "4", "6" and "7" should be evaluated further.

Additional Ways to Detect Fraud

Journal Entries – the following types of entries into the accounting system tend to be of more interest to auditors and fraud examiners than others, due to their unusual nature.

- **Manual entries** – manual journal entries (such as adjusting journal entries) often are posted outside the normal revenue/receipts and expense/disbursement processes of the accounting department. They are often legitimate and necessary but by nature fall outside the normal transaction processing (depreciation entries, payroll entries, accrual estimates, etc.). All organizations post manual entries, however, because of their nature, they at times circumvent normal internal control processes, and thus are more susceptible to fraud.
 - **Analysis:** Software can perform analysis of these entries and summarize them using certain fraud parameters as indicated below.
 - Entries posted on unusual dates – Software can search for manual journal and other entries posted on relevant holidays to further assess why an entry would be posted on such an unusual day outside of the normal course of business. Below are two unusual cash receipts posted on Labor Day and Christmas Day:

	DATE	JOURNAL	MEMO	DEBIT	CREDIT	ACCOUNTNUM	ACCOUNTDESCR
1	9/3/2018	Receipt-1433	Cash Receipts	45.00	0.00	1001	Cash in Bank
2	12/25/2018	Receipt-2516	Cash Receipts	93.39	0.00	1001	Cash in Bank
3	9/3/2018	Receipt-1433	September Receipt	0.00	45.00	1201	Unapplied Cash
4	12/25/2018	Receipt-2516	December Receipt	0.00	93.39	1201	Unapplied Cash

- Entries with unusual amounts – Software can easily extract for further analysis all manual entries with rounded or amounts ending in 999. This can provide items of potential fraud with fraudsters just getting under limits or controls in place.
- Entries posted by certain staff – Software can provide manual entries for certain staff that should not be posting entries.

Payroll – Frauds that occur in payroll are often related to a fictitious (sometimes referred to as “ghost”) employee created by a person with access to the payroll records. This scheme requires that the perpetrator fabricate biographical information such as name, age and social security numbers.

- **Analysis:** Software can analyze employee social security numbers by determining duplicates, sequential numbers or ones that are invalid.

Other Data Analytic Solutions

Accounts receivable aging limits – organizations may want to analyze their accounts receivable aging's further, but are constrained by the limits of their software. HW&Co. can help.

- *Due Date aging analysis greater than system limits* - The upper limit of an aging is normally 90, 120, 150 or 180 days. Situations might arise where an organization may want to know how their "Greater than 90 Days" aging bucket further ages. How many of these are over 120? 180? 210 days?
- **Analysis:** Software can take your accounts receivable detail and create aging buckets based on any criteria of due dates (or invoice dates) you may want. Would like to see aging greater than 45 days? 210 days? 300 days? You name it! We can help.

AR Aging by Paysource (Expanded to > 210 Days)
As of 12/31/2018

PAYSOURCE	BALANCE	Current	30 Days	60 Days	90 Days	120 Days	180 days	210 Days	> 210 Days
MAP	1,018,443.05	32,160.00	70,288.15	65,449.50	64,414.85	79,901.34	165,247.19	93,896.35	447,085.67
MB-AC	8,058.77	3,103.44	3,857.75	-	802.10	295.48	-	-	-
MB-ANT	15,195.99	-	7,772.89	6,219.05	1,065.77	-	138.28	-	-
MB-CI	126,875.39	4,427.29	10,937.20	6,725.77	3,980.29	837.08	3,386.50	4,246.01	92,335.25
MB-CM	75,556.56	(181.06)	749.31	913.81	3,286.55	950.51	7,123.26	325.74	62,388.44
MB-CP	9,236.00	558.96	668.58	(261.68)	1,501.34	(633.37)	1,975.33	945.26	4,481.58
MBM-PND	2,867.18	-	-	502.88	402.58	-	336.18	836.80	788.74
MCB	312,986.66	21,400.48	40,530.37	6,423.56	11,753.75	8,693.64	13,569.75	8,443.92	202,171.19

Inventory analysis – Many accounting modules offer sophisticated inventory solutions for managing inventory. While many of these work great for day-to-day tracking of inventory, you may wish to analyze your inventory in ways it cannot accommodate.

- *Lower of cost or net realizable value analysis* – Under Generally Accepted Accounting Principles (GAAP), inventory must be valued at the lower of the actual cost or the net realizable value.
- **Analysis:** Software can analyze your inventory to determine if any carrying values of inventory are overstated because selling prices are below their cost. This can help you conform with GAAP but also help you further analyze products that are no longer profitable.

	PRODUCT	PRODUCT_DESCRIPTION	QUANTITY	UNIT_COST	TOTAL_COST	LAST_SELLING_PRICE
1	110003	Product C	75	5.30	397.50	5.00
2	110013	Product M	258	1.77	456.66	1.75
3	110017	Product Q	453	1.56	706.68	1.50

- Slow moving or obsolete inventory – Inventory should be regularly evaluated for obsolescence. Perhaps you may want to know whether any products have not sold in the last nine months.
- **Analysis:** Using sales and inventory information provided, we can analyze your inventory for anything slow moving or not selling to determine whether write-downs of cost or a reserve for obsolescence are necessary. Furthermore, this analysis can be used to make targeted promotions or sales to customers in order to help keep the product moving or liquidated all together.

At HW&Co., our professionals hold certifications including Certified in Financial Forensics (CFF), Certified Fraud Examiner (CFE) and Certified Public Accountant (CPA). We help clients in a variety of ways from preventing fraud from occurring to increasing oversight more often during the year.