

## K2's Data Analytics For Accountants And Auditors

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# Learning Objectives



Upon completing this session, you should be able to:

- **List the four types of data analytics** and identify situations in which each can be useful in auditing environments
- **Identify opportunities to use features in Excel to analyze data** in the context of auditing
- **Distinguish between Business Intelligence and Data Analytics**
- **Differentiate between correlation and causation**
- Cite examples of how **Power Query, Power BI, and other tools can streamline and enhance Data Analytics**

# Major Topics Covered



Differentiating between the four types of data analytics

Analyzing transactional data using Benford's Law

Utilizing regression analysis in auditing contexts

Identifying and resolving quality of data issues

Working with Power Query, Power BI, and various Excel add-ins for better results in less time



## WHAT DATA ANALYTICS AND BUSINESS INTELLIGENCE REALLY ARE

# What Are These Terms?



## *Data Analytics and Business Intelligence*

- Many professionals use these two terms interchangeably, and that's understandable because these are related fields
- However, it is important to note that – although related – Data Analytics and Business Intelligence are **two distinct disciplines**, used for **different – yet, often complementary – purposes**
- In modern-day business, both fields have emerged as being **all but necessary in most successful organizations**

# What Is Business Intelligence?



*Business Intelligence is a set of procedures, tools, and technologies working in concert to transform raw data – potentially vast quantities of raw data – into meaningful information. Managers can use this information to help make decisions and prescribe courses of action that optimize organizational performance.*

# Why Business Intelligence?



Address the need for more timely and improved decisions



Automate repetitive reports



Identify trends and opportunities



Motivate team members and encouraging teamwork

# What Is Data Analytics?



*Data analytics is a tool used by BI. More specifically, business professionals use data analytics tools to build data analyses, forecasts, and projections. Data analytics focuses on identifying and managing data that can be useful in identifying **what happened, why it happened, what will happen in the future, and how we can improve.***

# Data Analytics Answers Four Questions



WHAT HAPPENED?



WHY DID WE  
ATTAIN A SPECIFIC  
SET OF RESULTS?



WHAT WILL  
HAPPEN IN THE  
FUTURE?



HOW CAN WE  
ACHIEVE BETTER  
PERFORMANCE?

# Comparing The Two



## Data Analytics

- At a very high level, **Data Analytics (DA)** refers to **transforming raw data to make it more useful**
- DA attempts to **identify patterns** in data, **relationships between data**, **supports BI**, and often answers the question of “**what will**” happen

## Business Intelligence

- **Business Intelligence (BI)** is typically used to **provide reports** that **help managers with decision-making** processes
- Typically, **BI efforts focus on historical data**, seeking to determine “**what**” happened and “**why**” it happened

# A Simple Forecasting Example



## Data Analytics

- Analysts may attempt to **identify the key drivers (predictors) of sales** and use these to **create forecast of future sales volume**
- This could be done through something as simple as Excel **regression models, FORECAST.ETS functions, and/or Forecast Sheets**

## Business Intelligence

- Managers might use BI reports to **identify relative progress toward meeting sales objectives**
- Additionally, with drill-down capabilities, these same **managers might be able to identify the “whys” behind significant variances**



***“BUT I’M AN ACCOUNTANT, I’M AN AUDITOR. I’M NOT A DATA ANALYST”  
...THINK AGAIN!***

# We Are All Data Analysts!



## *The Era Of Big Data Assures This*

- Increasingly, **most of us are being asked to wear the hat of the Data Analyst...**just look at the roles we have assumed
- We are no longer just *forms-fillers, paper-pushers, and bank account-reconcilers*...technology does that work for us
- And with **Robotic Process Automation (RPA)** beginning to show up in a big way, that **trend will only continue!**

# Accountants In Managerial Roles



- It's **not uncommon for those serving as financial managers to engage in optimization scenarios**
- For example, *“What sales mix would yield the highest gross profit, subject to our company’s specific constraints?”*
  - One of the keys to solving this problem is to **identify each significant constraint** in the process
  - Another is to **understand the relationships between the variables**
  - **Once these tasks have been completed, you can begin to construct your forward-looking forecasting and optimization models**



# Think About Auditors, For Example



- Many **organizations (not just accounting firms)** are beginning to move down the path of **continuous auditing**, using data analytics tools to alert them in real-time – or very near real-time – of anomalies in the data they are observing
- This potentially **reduces the need to sample data** and provides the **opportunity to examine 100% of the population in real-time** or very near real time
- As an example, consider the **opportunity for auditors to incorporate social media statistics into projections for future sales for a client that operates in the retail space**



**A VERY BIG HURDLE TO OVERCOME:  
*UNDERSTANDING CLIENT NEEDS***

## An Example...



- Someone may ask the question “*what is driving sales*”
- The **Accountant** might likely rush to their computer and generate various sales reports – *by customer, by item, by region, by salesperson, by channel, by location, etc.*– but this provides descriptive information...and, unfortunately, it doesn’t answer “*what is driving sales*”
- Don’t be misled, **there is value in these reports, but it doesn’t really help to answer the question “what is driving sales”**
- The **Data Analyst** would look to other data...

## An Example...



- Once the Data Analyst identifies all the relevant drivers of sales, they would begin to *identify the relationships in the data, create a data model, regress the data, and use the outputs to explain what drove sales* **in the past and, perhaps, build a model**
- However, **while the work outlined above may be useful in predicting the future, there is no guarantee that such a prediction will be useful or meaningful**
- Why not? It’s simple: **conditions and circumstances change** and as they do, we must revise our models, methods, and formulas

# Non-traditional Data Sources



Examples of diagnostic/predictive data we may need to consider to answer “*what is driving sales*” could include the following (*along with many more*)

- General macro-economic conditions in the area
- Search engine rankings
- Advertising spend, by market, by medium
- Online shopping cart abandonment rate
- Social media traffic
- Seasonality
- Pricing
- Customer satisfaction scores



***AND THINK ABOUT ALL THE DATA SOURCES  
AVAILABLE TODAY!***



## A VERY BIG HURDLE TO OVERCOME: *UNDERSTANDING CLIENT NEEDS*



## Understanding Real Needs

- When serving as a Data Analyst, recognize that **your client may not be able to appropriately express what their needs really are or what they really want to take away**
- This is critical, because these needs will **drive the data you need to collect, cleanse, summarize, and analyze**
- Their needs will also **drive the tools you use**

## An Example...



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- The **Accountant** might likely rush to their computer and generate various sales reports – *by customer, by item, by region, by salesperson, by channel, by location, etc.*– but this provides descriptive information...however, it doesn’t answer “*what is driving sales*”
- Don’t be misled, **there is value in these reports, but it doesn’t really help to answer the question “what is driving sales”**
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## An Example...



- A report comparing total sales over the prior five years to total credits issued would be ***descriptive analytics***
- An auditor might use regression analysis to forecast, for example, future credit memos past on historical data...***predictive analytics***
- The auditor might also use diagnostic analytics to determine why significant variances between the forecast and actual results materialized...this would be ***diagnostic analytics***
- ***Prescriptive analytics*** might be used to create an action plan for bringing credit memos back in line with expectations

## An Example...



Examples of diagnostic/predictive data we may need to consider to answer “*what is driving sales*” could include the following (*along with many more*)

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## An Example...



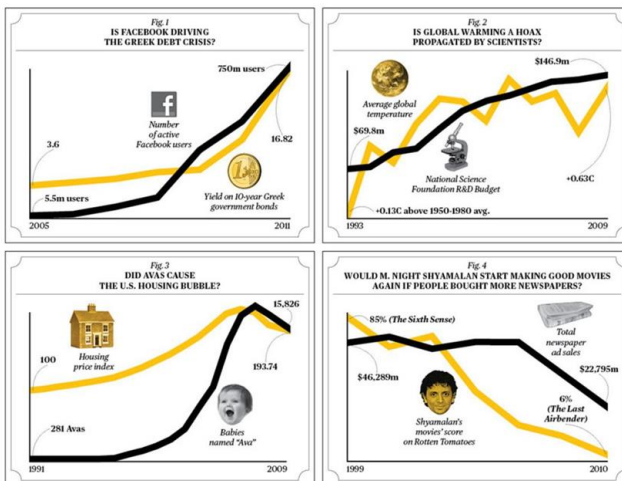
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# A Very Big Caveat!



- **Regression analysis** identifies the relationship between a dependent variable and one or more independent variables
- Often, **regression analysis can be used to identify and define cause-and-effect relationships** and help us to **predict the future with reasonable certainty**
- However, **just because two variables are related, you CANNOT infer a cause-and-effect relationship**
- Consider the case of **thunderstorms relative to ice cream sales**
- **Correlation DOES NOT Mean Causation!**

# Correlation & Causation



*Some examples of correlation, yes, but causation, probably not*



# DATA ANALYTICS TOOLS

## Everyday Data Analytics Tools



Excel

Excel Add-ins

Power BI  
Desktop

PowerBI.com



# Excel As A Data Analytics Tool



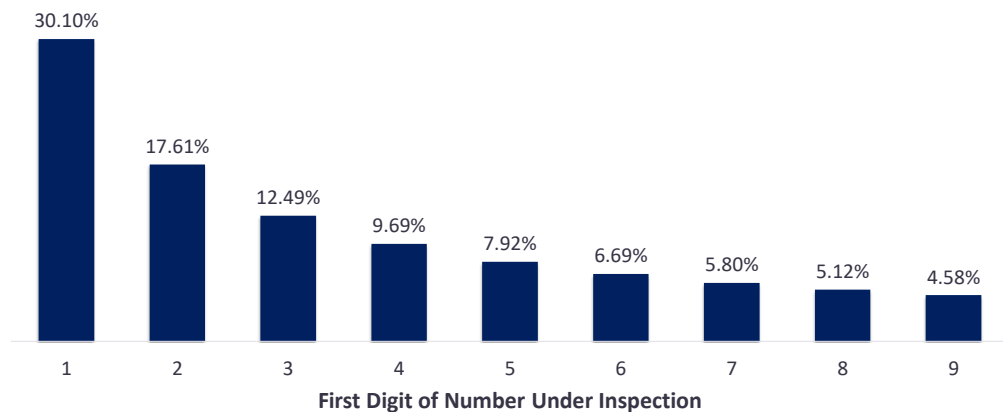
Solver

Data Analysis  
Toolpak

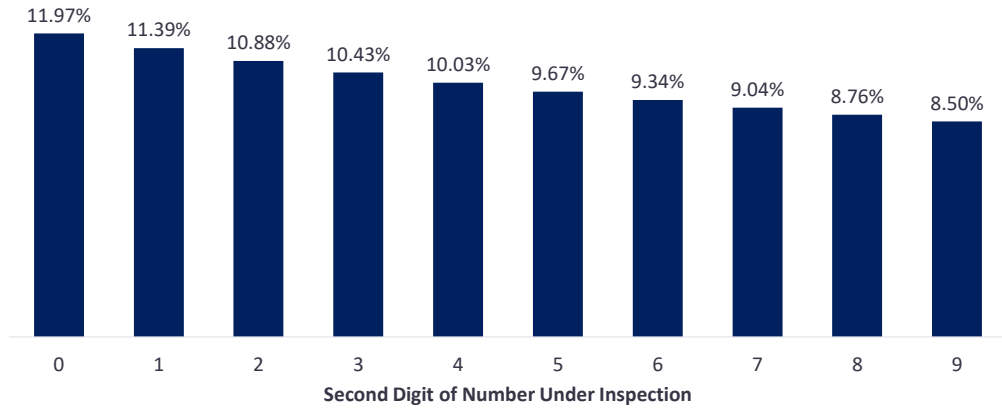
Regression  
Analysis

Analyze Data

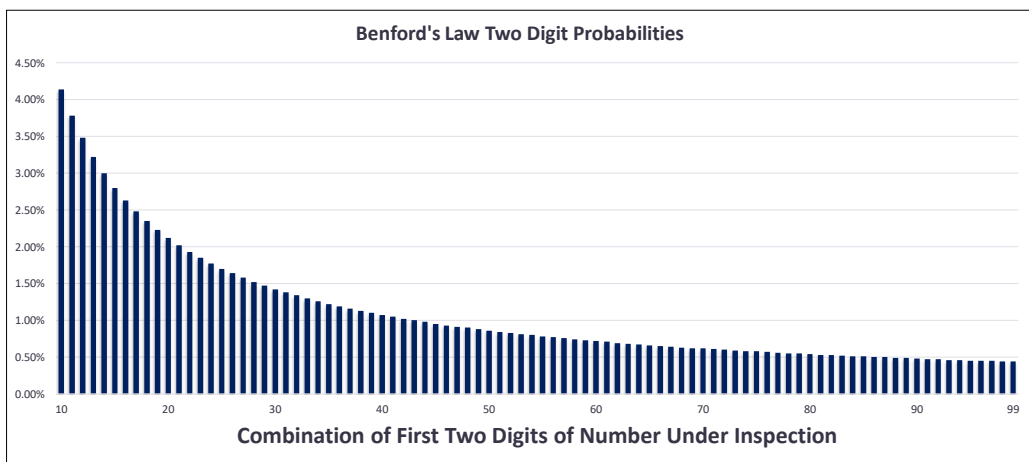
# Benford's First Digit Probabilities



# Benford's Second Digit Probabilities



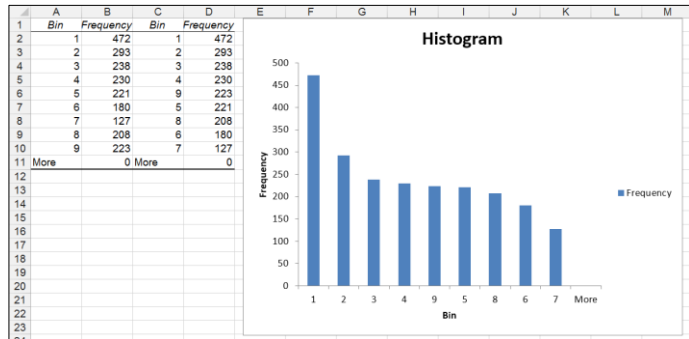
# First Two Digit Probabilities



# Benford's Law



- You can use the Analysis ToolPak's **Histogram** tool to create the groupings for a Benford's test by extracting the first digit from each number in a series
  - Use Excel's **LEFT** function for this step
- Then, create a Histogram with "1" through "9" as the various bin groupings



# Limitations Of Using Benford's Law



- First, **large sets of data are more likely to fit Benford's Law than smaller sets**
  - As with virtually all mathematical models, large sets of data are more reliable
- Second, **any set of data based on assigned numbers will likely not follow Benford's Law**
  - A good example would be Social Security Numbers, which are issued based on a prescribed order and methodology
- Third, **any set of numbers where the population has defined minimum values, maximum values, or both will likely not conform to Benford's Law**

# Excel's Analyze Data Feature



- Excel's **Analyze Data** feature (formerly known as Ideas) can take **a large data set and quickly summarize and analyze it**
- The output can help you to **identify trends and relationships** in your data that you may not have known existed
- Additionally, you can **“ask questions” about your data by just typing them in Excel**

# Predictive Analytics Using Excel



- As with descriptive analytics, **numerous options exist for generating predictive analytics**
- The most common methods include Excel's **FORECAST** and **FORECAST.ETS** functions and the **Forecast Sheets** feature
- **These tools can predict the future based on the relationship between a dependent variable and an independent variable**
- **FORECAST.ETS identifies seasonality** in the data and incorporates it into the forecast and **Forecast Sheets allows for confidence intervals**

# Regression Analysis In Excel



- For more advanced predictive analytics, you could use **Excel's Regression Analysis tool**, found in the Analysis ToolPak
- You can build your forecasts on up to **sixteen** independent variables
- The **tool will generate an R-square value** which will help you to understand the “fit” of the data
  - **R-square values greater than 0.8 generally indicate a good “fit” of the data**
- Remember that discussion on correlation and causation? **It's important here!**

# Solver For Prescriptive Analytics



- You can use **Solver** (another Excel add-in) **to assist in identifying the proper mix of inputs to achieve the best result**
- Solver models can identify the inputs necessary to realize **maximum values, minimum values, or specified values** – subject to **user-defined constraints**
- Note, this is **NOT** the same as **Goal Seek**



# USING POWER BI FOR DATA ANALYTICS

## Summary



- Accountant's and auditor's roles are changing...***quickly!***
- We are being **called upon to provide more "value-added" services** than ever before
- Knowing how to **work with big data and turn it into actionable assets**, is now a requirement for many
- Fortunately, **a growing list of tools makes this a relatively easy task, with just a little effort involved to get started**
- **Excel – bolstered by a few add-ins, and Power BI give you a powerful set of tools for your Data Analytics efforts**



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**THANK YOU!**