MIS 5208 – Lecture 06 – Data Driven Fraud Detection

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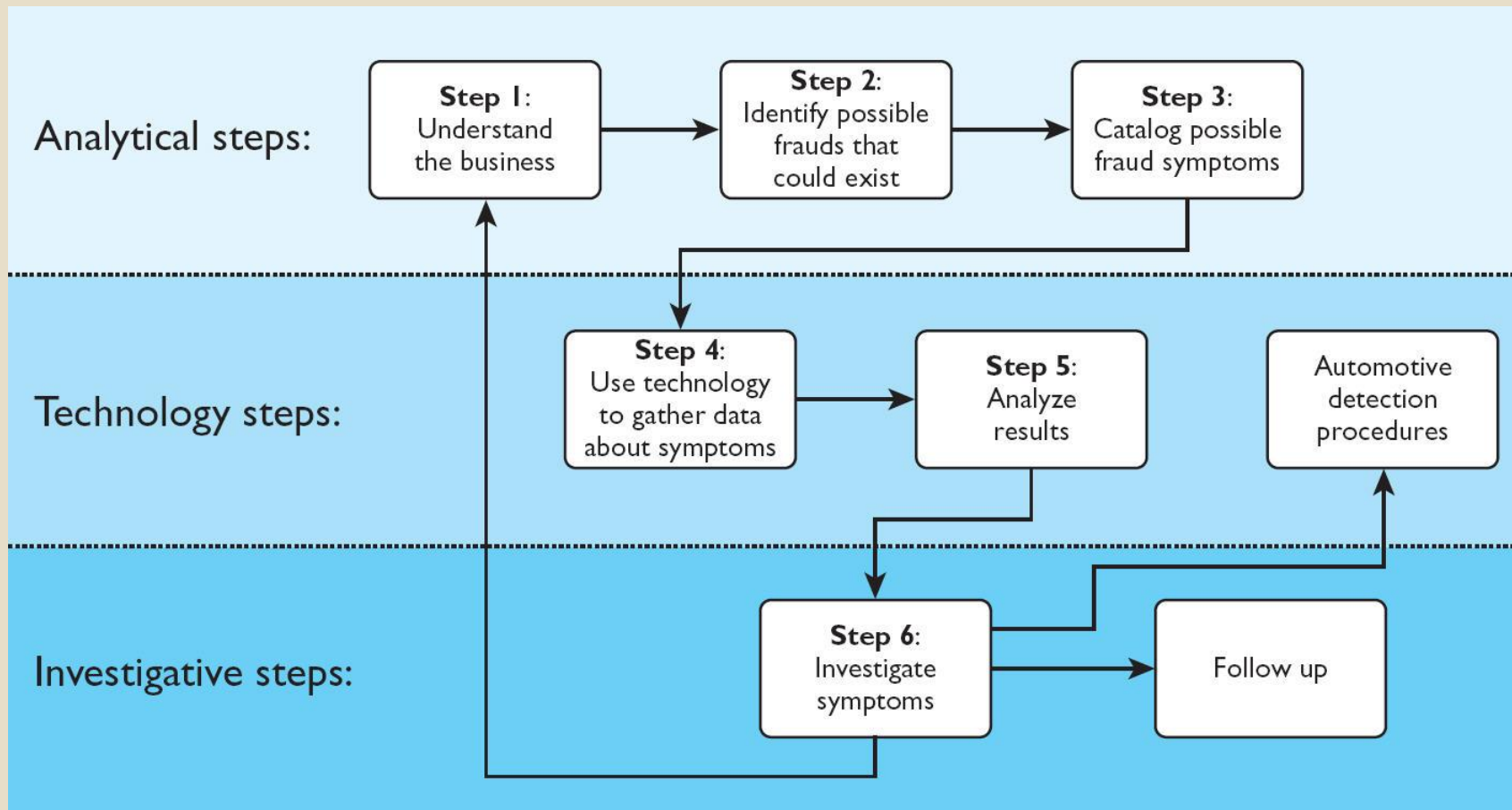Caswell.Anderson@temple.edu

Learning Objectives

1. Describe the importance of data-driven fraud detection, including the difference between accounting anomalies and fraud.

2. Explain the steps in the data analysis process.

3. Be familiar with common data analysis packages.

4. Understand the principles of data access, including Open Database Connectivity (ODBC), text import, and data warehousing.

5. Perform basic data analysis procedures for fraud detection.

6. Read and analyze a Matasos matrix.

7. Understand how fraud is detected by analyzing financial statements.

Data-Driven Fraud Detection

- Auditors have analyzed data to detect fraud and anomalies for many decades.

- Fraud vs. Anomalies
- Anomalies…
  - are not intentional
  - will be found throughout a data set
- Fraud…
  - is intentional
  - is found in very few data sets
  - is like "finding a needle in a haystack"

Proactive Method of Fraud Detection

Analytical steps:

Step 1: Understand the business → Step 2: Identify possible frauds that could exist → Step 3: Catalog possible fraud symptoms

Technology steps:

Step 4: Use technology to gather data about symptoms → Step 5: Analyze results → Automotive detection procedures

Investigative steps:

Step 6: Investigate symptoms → Follow up

Data Analysis Software

- ACL Audit Analytics
  - Powerful program for data analysis
  - Most widely used by auditors worldwide
- CaseWare's IDEA
  - Powerful program for data analysis with more Windows-like user interface
  - ACL's primary competitor
- Microsoft Office + ActiveData
  - A plug-in for Microsoft Office
  - Provides data analysis procedures
  - Based in Excel and Access
  - Less expensive alternative to ACL and IDEA

Data Access

STOP & THINK *What are the relative advantages and disadvantages of ODBC compared with text file import?*

- Gathering the right data in the right format during the right time period.
- **Methods include:**
  - Open Database Connectivity (ODBC)
  - Text Import
  - Hosting a Data Warehouse

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Data Analysis

- Analysis techniques that are most commonly used by fraud investigators:
    - Data Preparation
    - Benford's Law
    - Digital Analysis
    - Outlier Investigation
    - Stratification and Summarization
    - Time Trend Analysis
    - Fuzzy Matching
    - Real-Time Analysis

Data Analysis Matasos Matrix

- One way to view the results of multiple indicators is to use a chart called a Matasos matrix:

CONTRACT	WINNING VENDOR	NUMBER OF RED FLAGS	LOST BIDS	BRAND NAMES	LAST BIDDER WINNER	SEQUENTIAL BID SECURITY NUMBER
100221	Direct Corp.	1	0%	70%	0%	0%
523332	Satyoo	2	0%	68%	0%	100%
351223	Danicorp	1	0%	72%	0%	0%
387543	Under Inc.	3	0%	70%	100%	100%

Financial Statement Analysis

Approaches to Financial Statement Analysis:

1. comparing account balances from one period to the next

2. calculating key ratios and comparing them from period to period

3. performing vertical analysis

4. performing horizontal analysis

Thank you