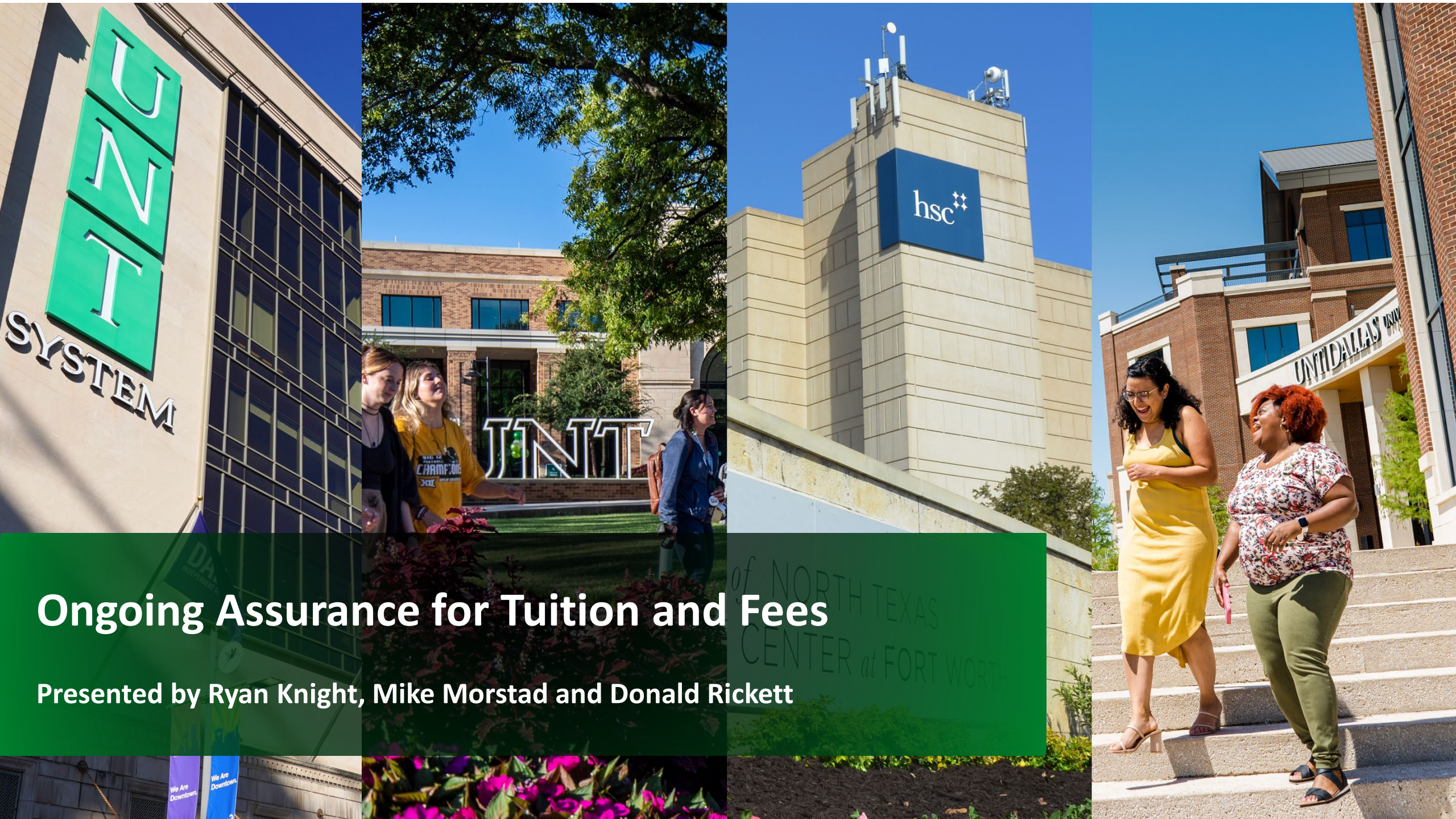

Ongoing Assurance for Tuition and Fees

Presented by Ryan Knight, Mike Morstad and Donald Rickett

Today's Presenters

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Learning Objectives

- ❑ Explore Audit Analytics and the tools and software used
- ❑ Explore how data analytics can be leveraged to review accuracy of Tuition and Fees
- ❑ Learn some common challenges when testing Tuition and Fees with data analytics
- ❑ Understand the initial investment required to stand-up a program
- ❑ Discuss how a mature continuous monitoring program could operate

Overview of UNT System Enterprise

UNT

- Located in Denton
- 46,940 students
- 3rd largest university in Texas
- Tier 1 research university

UNT Dallas

- Located in Dallas
- 3,800 students
- Only public, accredited 4-year university in Dallas
- College of Law

UNTHSC

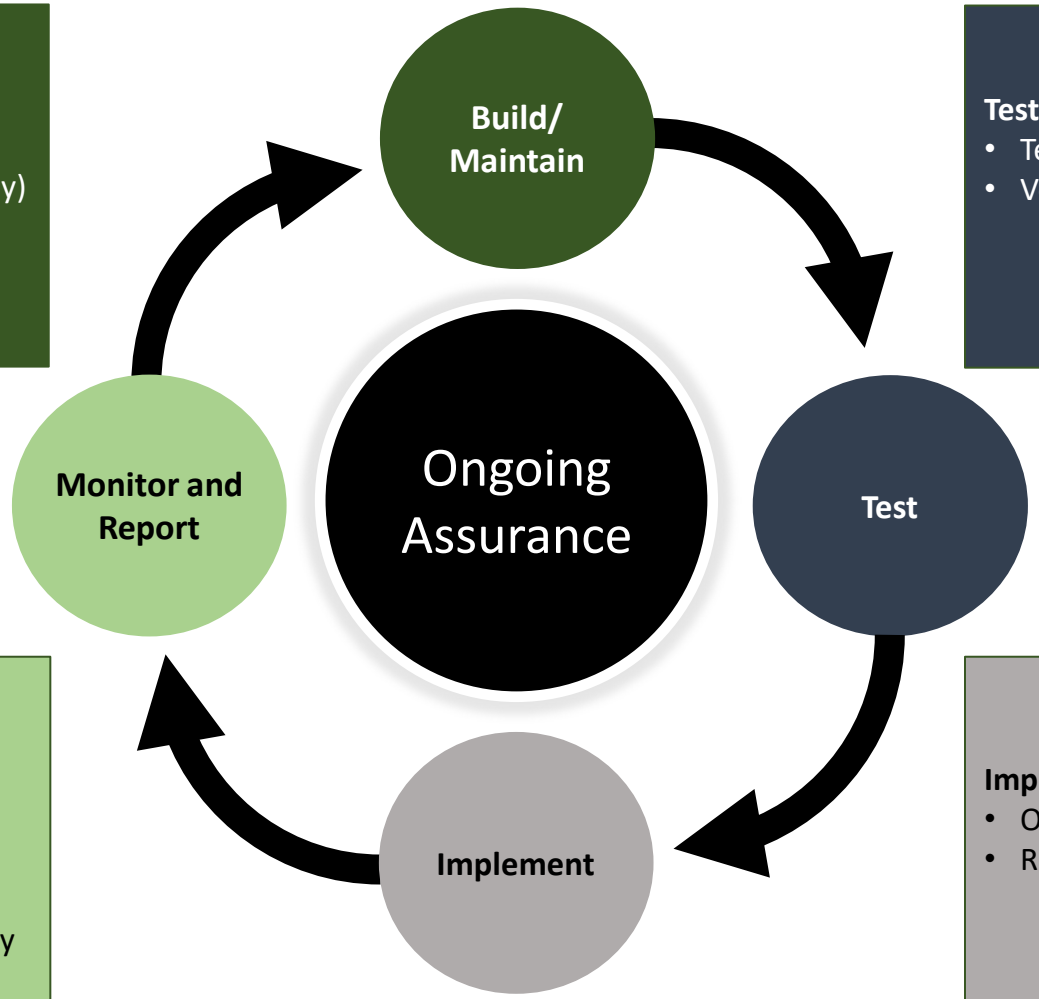
- Located in Fort Worth
- 2,400 students
- Graduate academic medical center
- Top producer of primary care physicians in Texas

Ongoing Assurance Implementation Methodology

Program Goal: Provide assurance on the accuracy of the largest revenue items on financial statements: Tuition and Fees

Build
- Prioritize areas based on business value
- Determine requirements/business rules
- Understand data needed and its availability
- Determine audit rules (e.g., frequency, materiality)
- Develop scripts/programing following rules

Maintain:
- Make updates as changes occur in environment



Test:
- Test script and parameters
- Verify accuracy of results

Monitor:
- Review and validate exceptions/outliers
- Adjust queries and scripts to limit false positives

Report:
- Identify source of errors/ control weaknesses
- Report validated exceptions that meet materiality

Implement:
- Obtain/extract data sets
- Run programming

What is Data?

Data is any information being collected: number, statistics, measurements, words, observations, inputs, etc.

Quantitative data deals with numerical values that can measured and counted. (Example: The number of people in this room)

Qualitative data deals with things which can be **observed** but cannot be measured quantitatively. (Example: The color of someone's hair)

Depending on the data collected, you can derive different **relationships** represented within your quantitative and qualitative data.

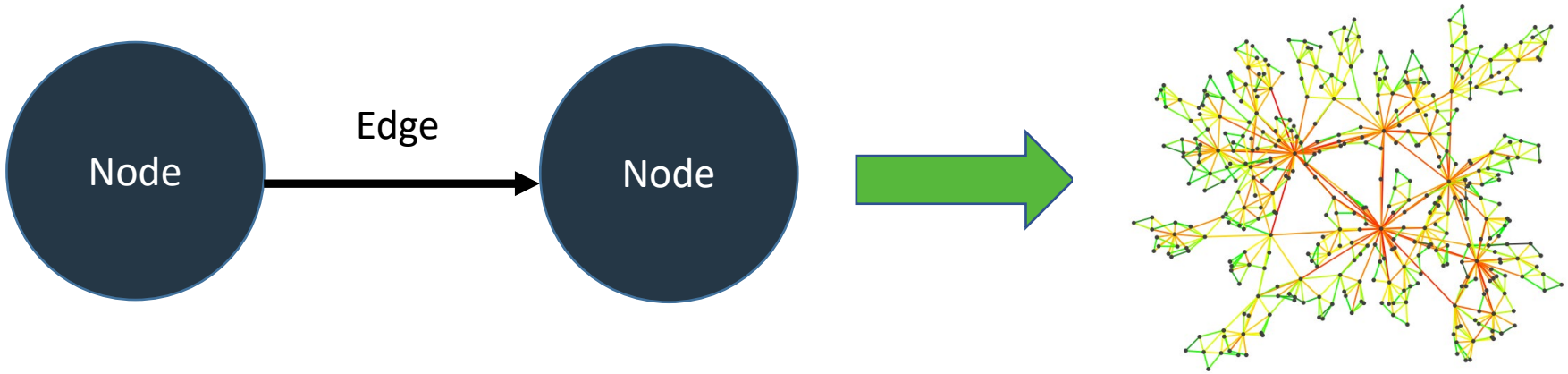
Data Structures

Data is stored in various structures depending on analytical needs

Database (Relational)

Tables

Database (Graph)



What is Data Analytics?

Data Analytics is the process of leveraging data to derive meaningful insights.

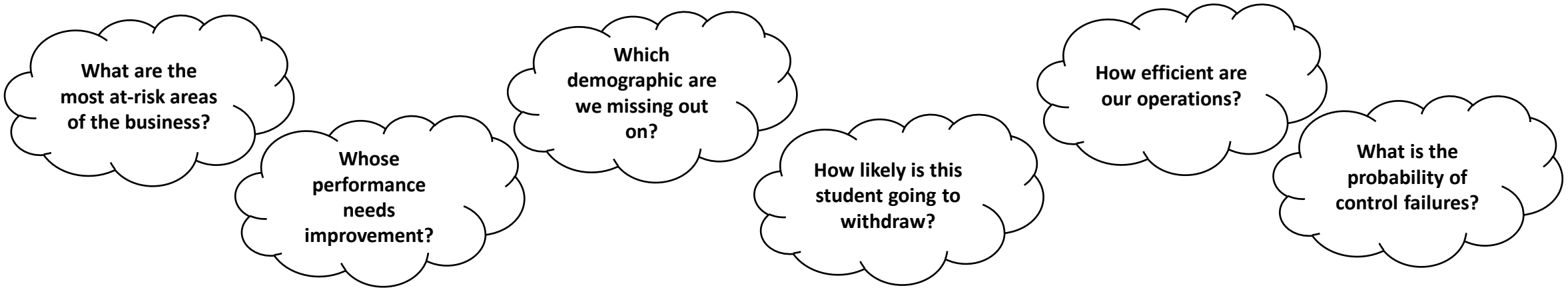
Benefits of Data Analytics include **simplifying** information, **monitoring** operations, **detecting** areas for improvement.

Data Analytics is **essential** to ensuring the **decision-making** process is smooth, efficient, and **accurate**.

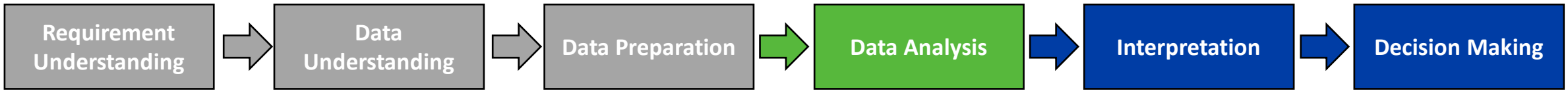
The Financial Sector is one of the most mature industries for adopting Data Analytics, initially to **predict market trends** and **assess risk**.

Insights from Data Analytics

The results of Data Analytics should provide insights that analysts and stakeholders can use



General Process



Introducing SQL

SQL, Structured Query Language, is used for accessing and manipulating databases

Common SQL Uses

- Retrieving data via from databases
- Structuring data for analysis
- Insert, update, delete database records
- Create new databases and tables

Data Analytics Uses

- Querying pertinent data from various sources
- Providing a repeatable process for data retrieval
- Scheduling and running data processes

Introducing Python

Python an open-source, interpreted, object-oriented, high-level programming language

Common Python Uses and Advantages

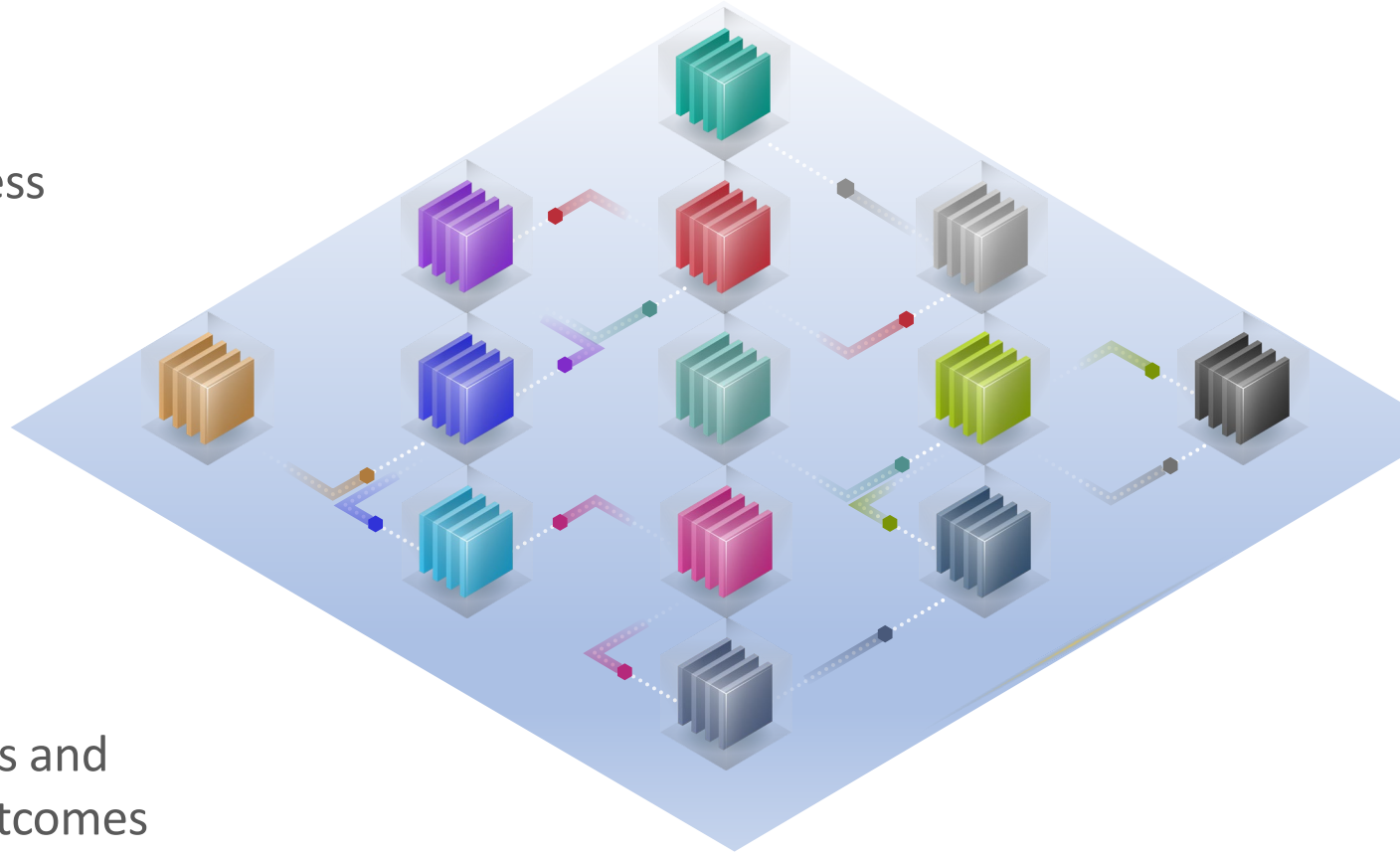
- Data Analytics, Scientific Computing, Networking, Web Development
- Easily readable
- Open-source (Read: $Free.99)
- Extensively supported

Data Analytics Uses

- Easy data wrangling and cleansing
- Customized visual creation
- Advanced computations and analysis
- Machine Learning

The Key Tenets of a Transformation Platform

- Guides the way to Analytics, AI, ML and More
- Automates Data-driven Business Processes
- Engages via a Human-centered Experience
- Ensures Transparency and Traceability
- Makes AI Explainable
- Enables Quick Wins and Transformative Outcomes

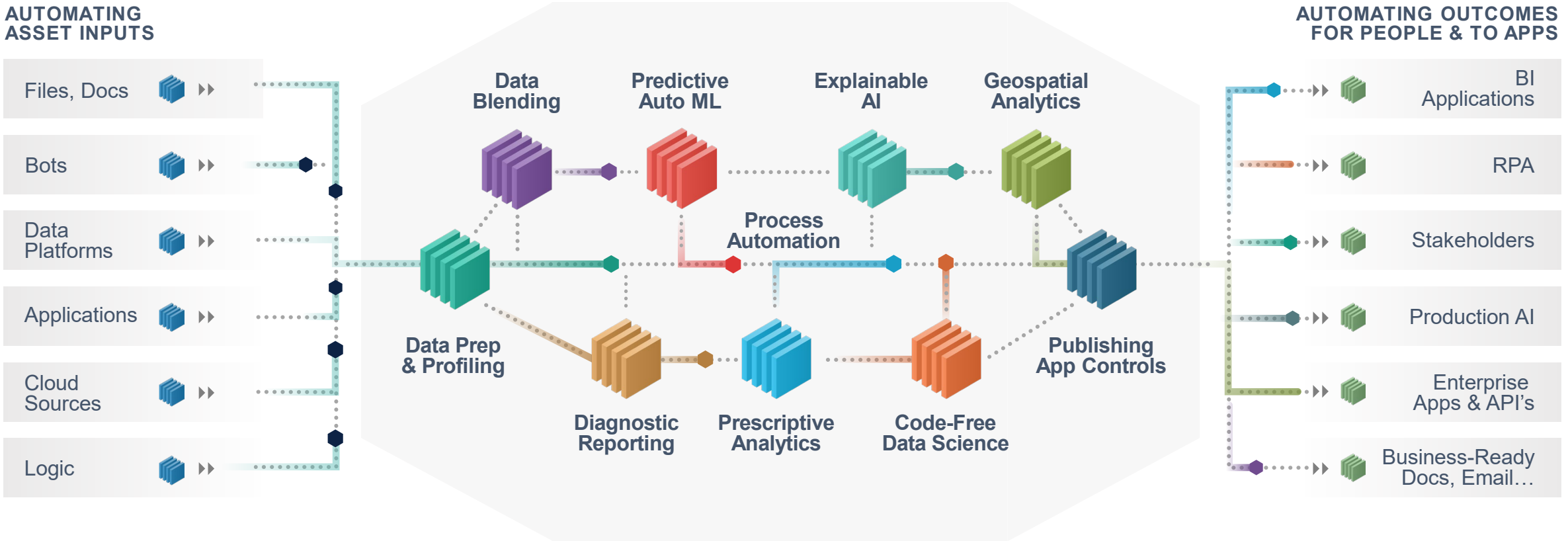


ALTERYX Analytics process automation platform

Unified analytics, data science and process automation

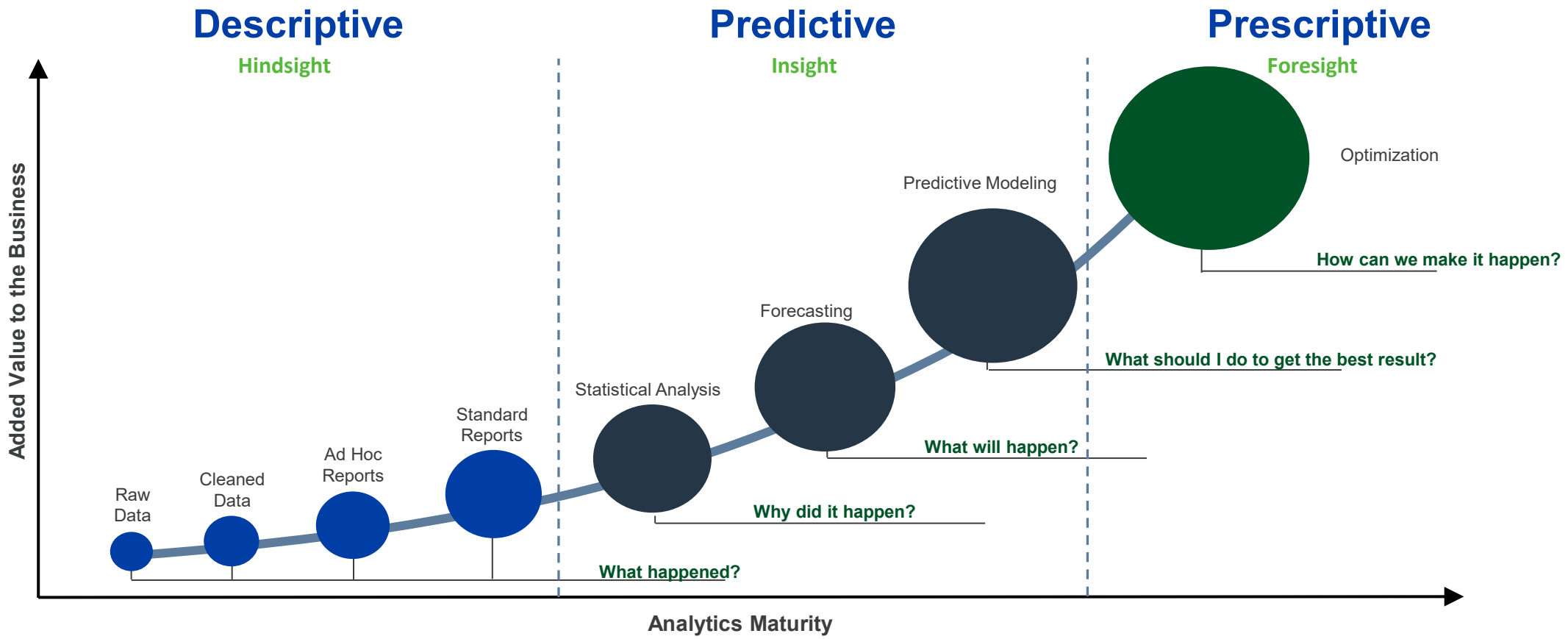
UNIFY DATA, PROCESS AND PEOPLE

260+ **ANALYTICS + DATA SCIENCE + PROCESS AUTOMATION** BUILDING BLOCKS
THAT LET YOU **START ANYWHERE**

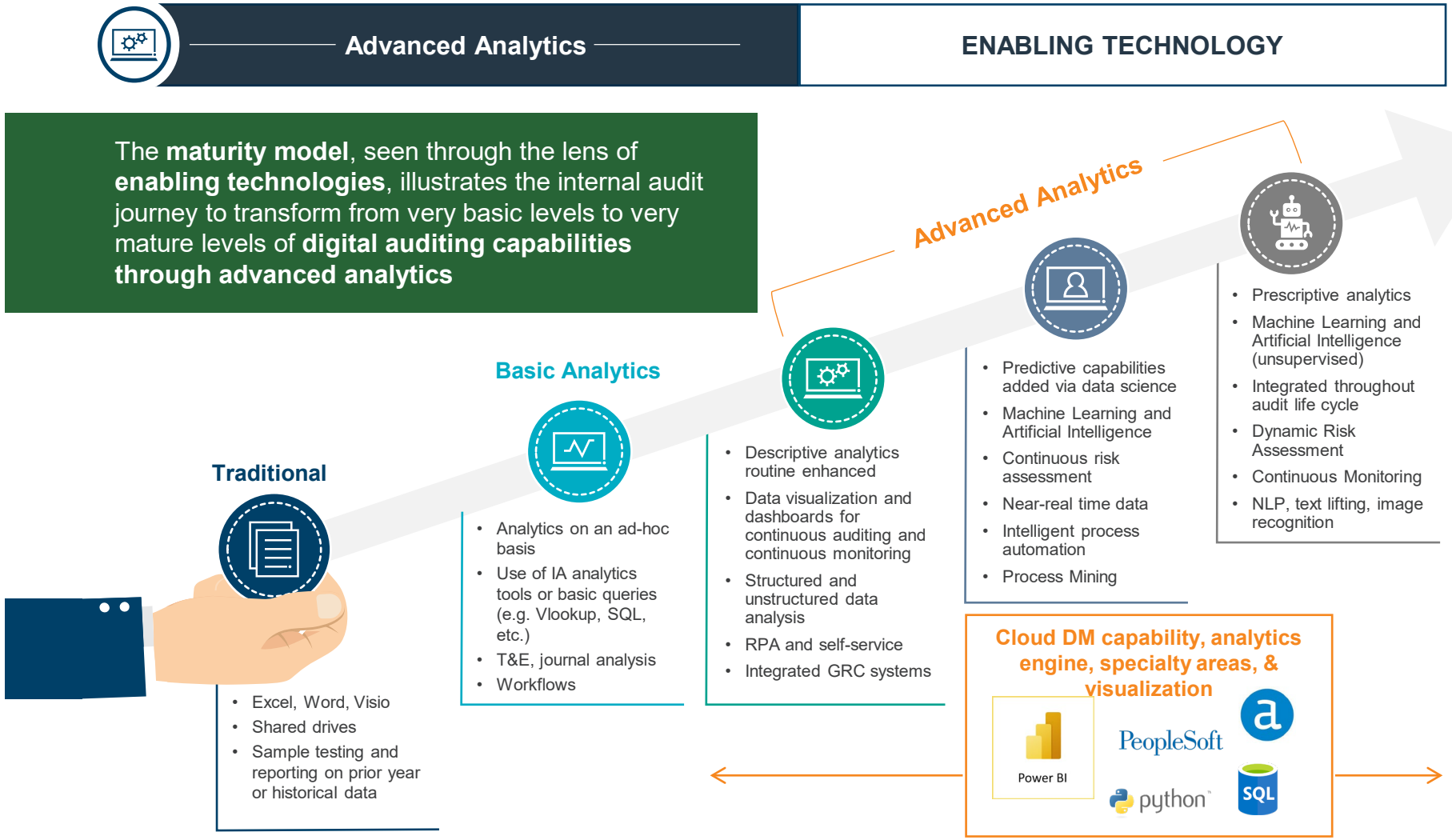


The Analytics Maturity Curve

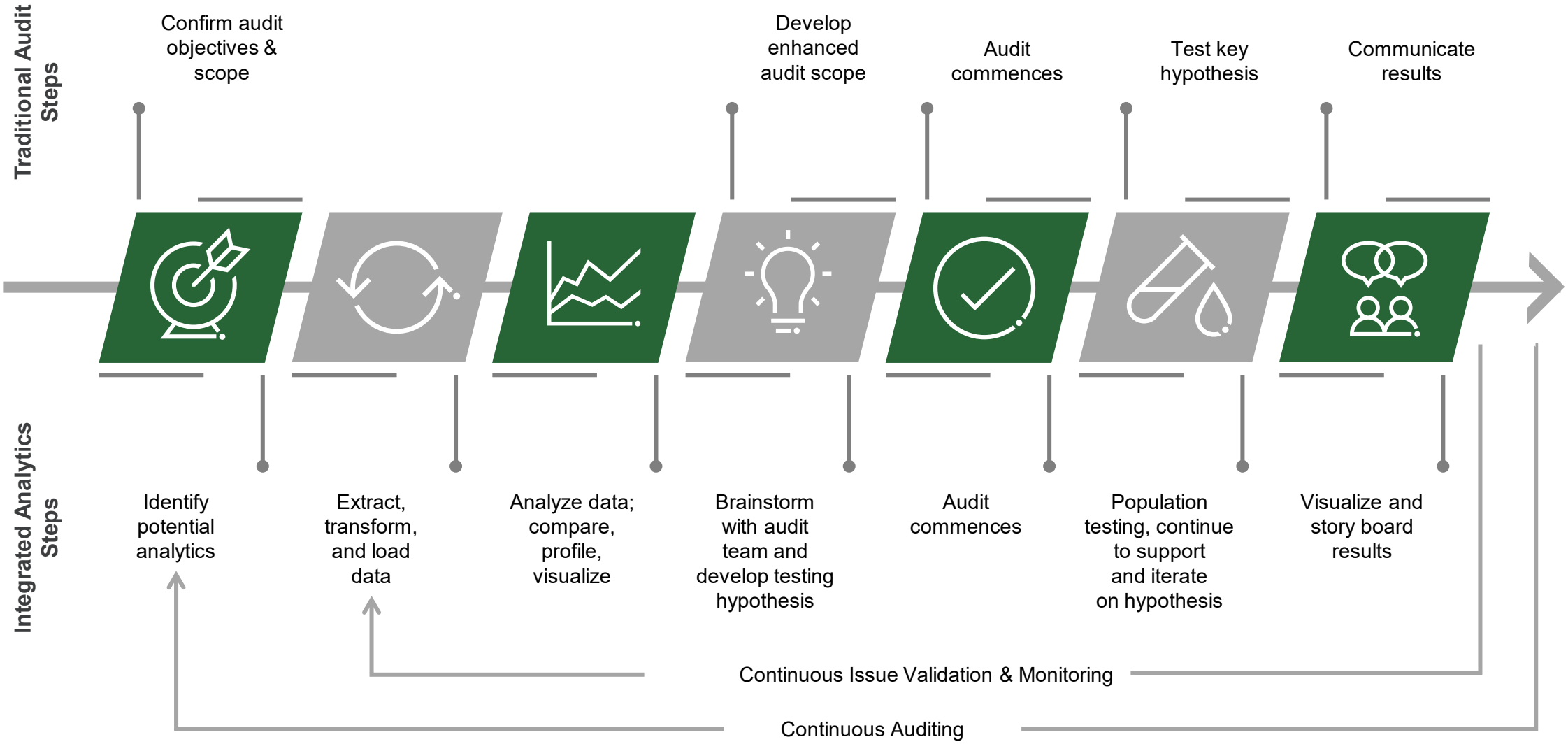
Moving along the analytics maturity curve, from **descriptive approaches** to **predictive modeling**, from **hindsight** to **foresight**, from answering **"what happened?"** to **"what should I do to get the best results?"**



Evolution of Data Analytics in Internal Audit



The Road to Analytics and Audit Integration



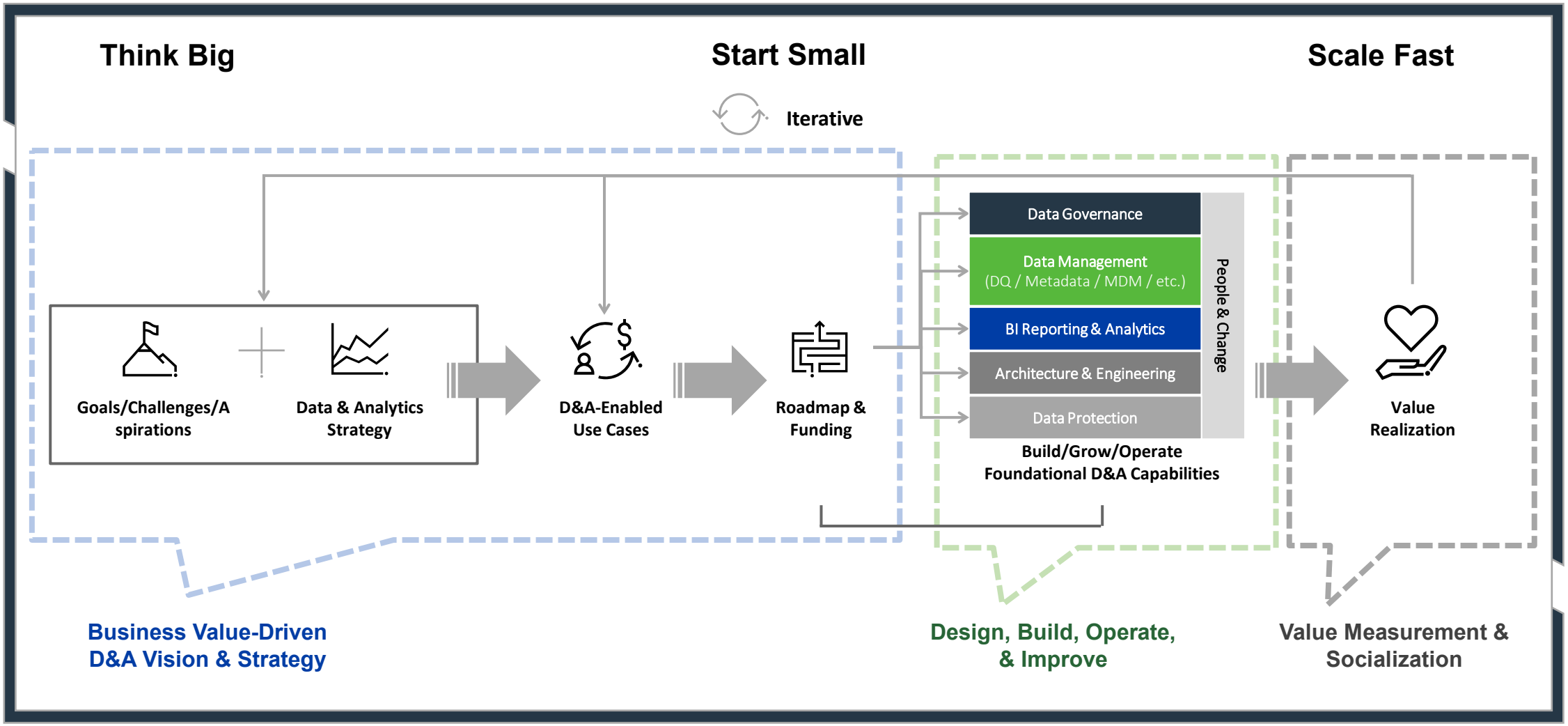
Data Analytics Components – Internal Audit

Analytics can benefit several aspects of a traditional internal audit – primarily by increasing risk coverage, attaining broader and more accurate testing results, utilizing fewer resources during an audit, and automating the overall testing process.

Audit More Effectively
Audit More Efficiently
Identify Risks Timely

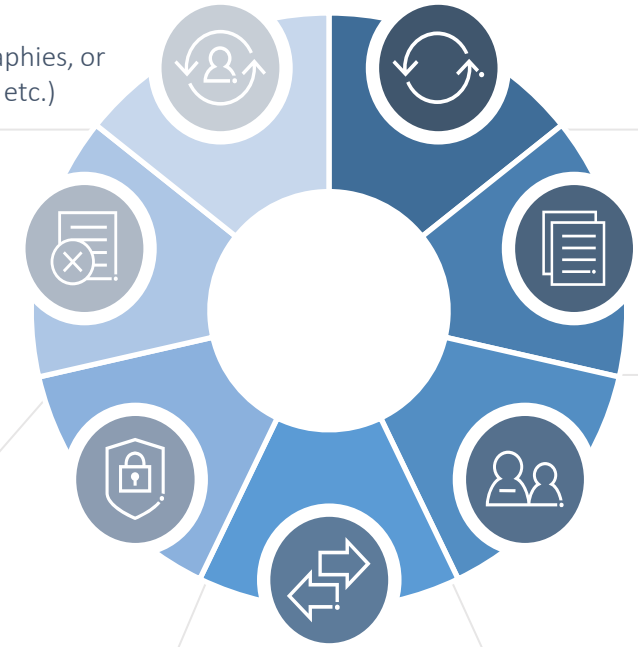
	Sample Testing	Test Case Sourcing	Audit Testing	Result Reporting	Continuous Monitoring
Traditional Audit Techniques	**Sample** In a traditional corporate audit, a sample selection of about 5-10% of the total population is used for testing.	**Client Fatigue** Test case sourcing is typically provided from the client side.	**Manual** Typical audit tests are completed manually, by cross referencing documents and data sources. This allows for greater chance of human error.	**Manual** Reports on testing results are also manually compiled in a traditional audit.	**Manual** The continuous monitoring of testing progress and results are done manually in a typical corporate audit.
D&A Integrated Techniques	**Population** With D&A capabilities, full populations can be tested. This allows for more coverage and greater insights into testing.	**Self-Service** D&A allows for direct access to test case sourcing, which reduces the client's workload and automates the testing process.	**Scripted** Analytics automates several aspects of typical audit testing, reducing the margin of error and time spent on testing.	**Automated** With D&A, reporting results can be generated through a variety of analytics software suites, increasing automation and reporting accuracy.	**Streamlined** Continuous monitoring can be both automated and scheduled (i.e. dashboarding) with D&A methods.

Data Analytics Starts And ends with Business Value



Indicators of Data Analytics Opportunities

The framework below provides an overview of indicators for opportunities to engage analytics to provide additional value for a particular audit area.



Repetitive Audit Procedures
Audits repeat across business units, locations, geographies, or time (e.g., annual SOX testing, location-based audits, etc.)

Information Exists In Unstructured Data
Information is captured in unstructured data format that is difficult to mine/report on

System Processing/ Data Integrity Issues
System processing or data/report integrity issues are suspected or have existed in the past

High Transaction Volumes
The area audited includes high transaction volumes that are retained over meaningful periods of time

Common Process Areas
Audit of a process where analytics are frequently applied

Manual Audit Procedures
Traditional audit procedures in the area are extremely manual, time-consuming, and/or tedious to perform

Inadequate Management Reporting
Business or management reporting in the area audited would not sufficiently identify risks or process breakdowns

Tuition & Fees Continuous Monitoring

- **Continuous Monitoring** of Tuition and Fees (T&F) each semester allows a University to identify **any anomalies in Tuition and Fees** being charged to students and gives absolute assurance regarding revenue to the Institution and its Board.
- Protiviti helped a client analyze the accuracy of Tuition & Fees charges for **100%** of the University's Main Campus population, roughly **40,000 students.** Previous analyses were completed through **sample testing** by Student Financial Services (SFS)
- **Repeated in subsequent semesters with minimal additional effort, regardless of tuition structure**

Initial Analysis

- Protiviti obtained Tuition & Fees data extracts from SFS the for entire 40,000+ student population
- 44 anomalies, consisting of both over and undercharges were found
- The University was currently seeing a larger number of out of state online courses due to the pandemic. Consequently, Students being charged a mix of Out-of-State Teaching Fees, and In-State tuition was one of the issues found

Continuous Monitoring Across Campuses

- Since the initial analysis, the audit has expanded to satellite campuses
- T&F Continuous Monitoring has become a perpetual analysis, being completed every Spring and Fall semester
- Evaluating two campuses of the University's system takes <20% of the time as the initial analysis
- With changes to charge structures each year, new gaps are discovered and resolved down to the penny

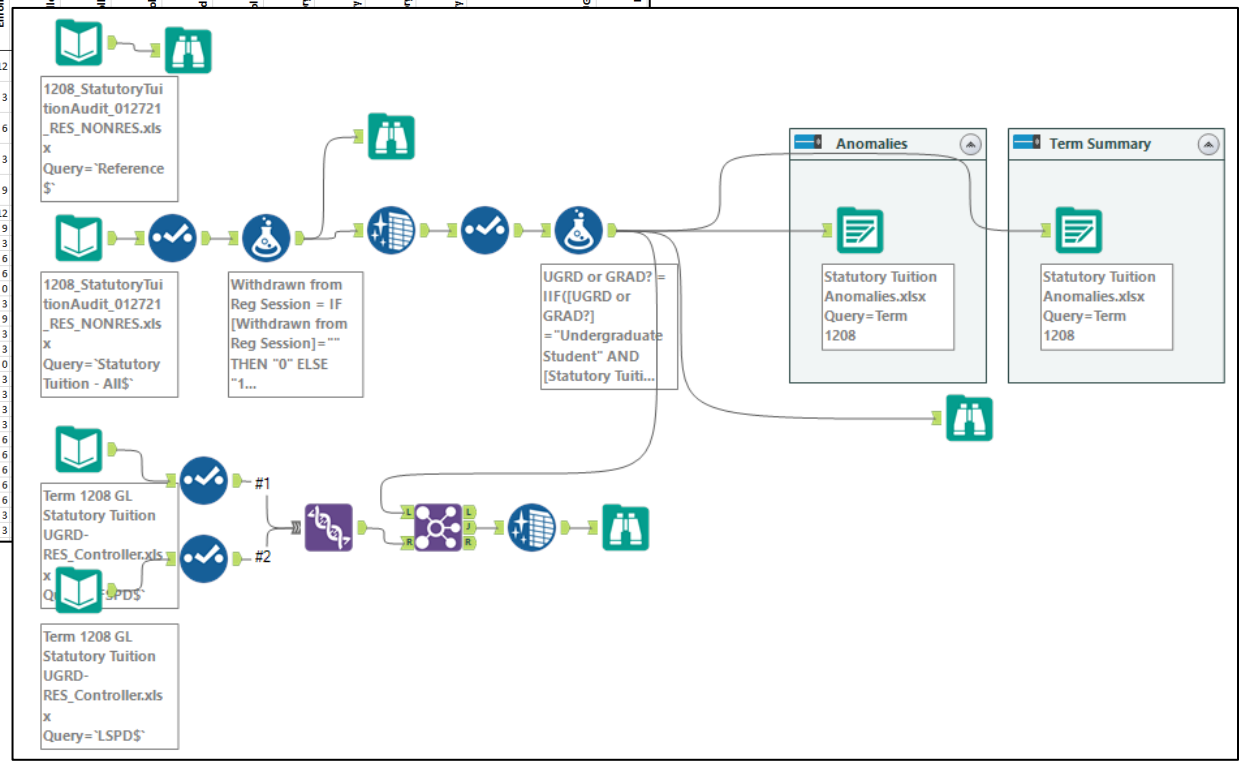
Manage the Accuracy of Tuition and Fees at Your Institution

- Our system-agonistic tools work across various ecosystems
- Pilot program was completed in a state with a complex and tiered tuition structure. The tool can be configured to accommodate any tuition model, including complex models of graduate programs, doctorate programs, and other non-traditional programs.

Example Analytical Flow

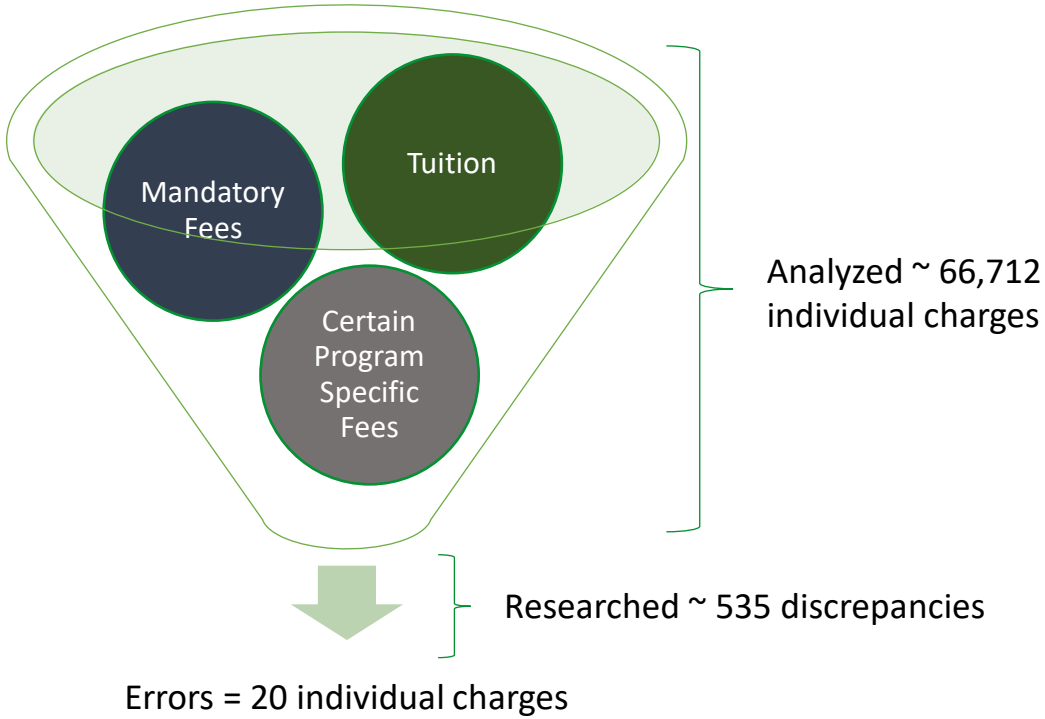
Data → Alteryx

EMPLID	Term	Tuition Group	Academic Level	Withdrawn from Reg Session	Withdrawn from 8W1 Session	Withdrawn from 8W2 Session	Total Hours	Enrolled MAIN Campus	Enrolled Remote Campus	Enrolled INET Campus
11422372	1208	NONRESIDNT	FRESHMAN	0	1	0	12	0	0	12
10870976	1208	NONRESIDNT	MASTERS	0	1	0	6	0	0	3
10747477	1208	RESIDENT	DOCTORAL	1	0	0	6	0	0	6
11316992	1208	RESIDENT	FRESHMAN	0	1	0	3	0	0	3
11416067	1208	RESIDENT	FRESHMAN	0	1	0	15	0	6	9
11363129	1208	RESIDENT	FRESHMAN	1	1	0	15	0	3	12
11413235	1208	RESIDENT	FRESHMAN	1	0	1	15	6	0	9
11387911	1208	RESIDENT	FRESHMAN	0	1	0	15	9	3	3
11172665	1208	RESIDENT	JUNIOR	1	1	0	10	0	3	6
11336857	1208	RESIDENT	JUNIOR	1	1	0	12	0	6	6
11399377	1208	RESIDENT	JUNIOR	1	1	0	14	0	11	0
11295406	1208	RESIDENT	JUNIOR	0	1	0	15	6	6	3
11293387	1208	RESIDENT	JUNIOR	1	1	0	18	3	6	9
11398578	1208	RESIDENT	MASTERS	0	0	1	3	0	0	3
11408918	1208	RESIDENT	MASTERS	0	0	1	3	0	0	3
10796954	1208	RESIDENT	MASTERS	0	1	0	3	0	0	0
11154761	1208	RESIDENT	MASTERS	0	0	1	3	0	0	3
11379490	1208	RESIDENT	MASTERS	1	0	0	3	0	0	3
11463395	1208	RESIDENT	MASTERS	0	0	1	3	0	0	3
11070912	1208	RESIDENT	MASTERS	1	0	0	3	0	0	3
11400643	1208	RESIDENT	MASTERS	1	0	0	6	0	0	6
11410021	1208	RESIDENT	MASTERS	1	0	0	6	0	0	6
11460999	1208	RESIDENT	MASTERS	1	0	0	6	0	0	6
11461882	1208	RESIDENT	MASTERS	1	0	0	6	0	0	6
11405143	1208	RESIDENT	MASTERS	1	0	0	6	0	0	6
11462567	1208	RESIDENT	MASTERS	1	1	1	9	0	3	3
11435983	1208	RESIDENT	MASTERS	0	1	0	9	0	3	3



Health Science Center Tuition and Fees Audit Results

Internal Audit completed a first-time analytical procedures review of the accuracy of the Tuition and Fees (T&F) charged to students at the five colleges of UNT Health Science Center (HSC) for the FY23 fall semester. Twenty errors identified, representing 0.065% of approximately $14.3MM in gross T&F.



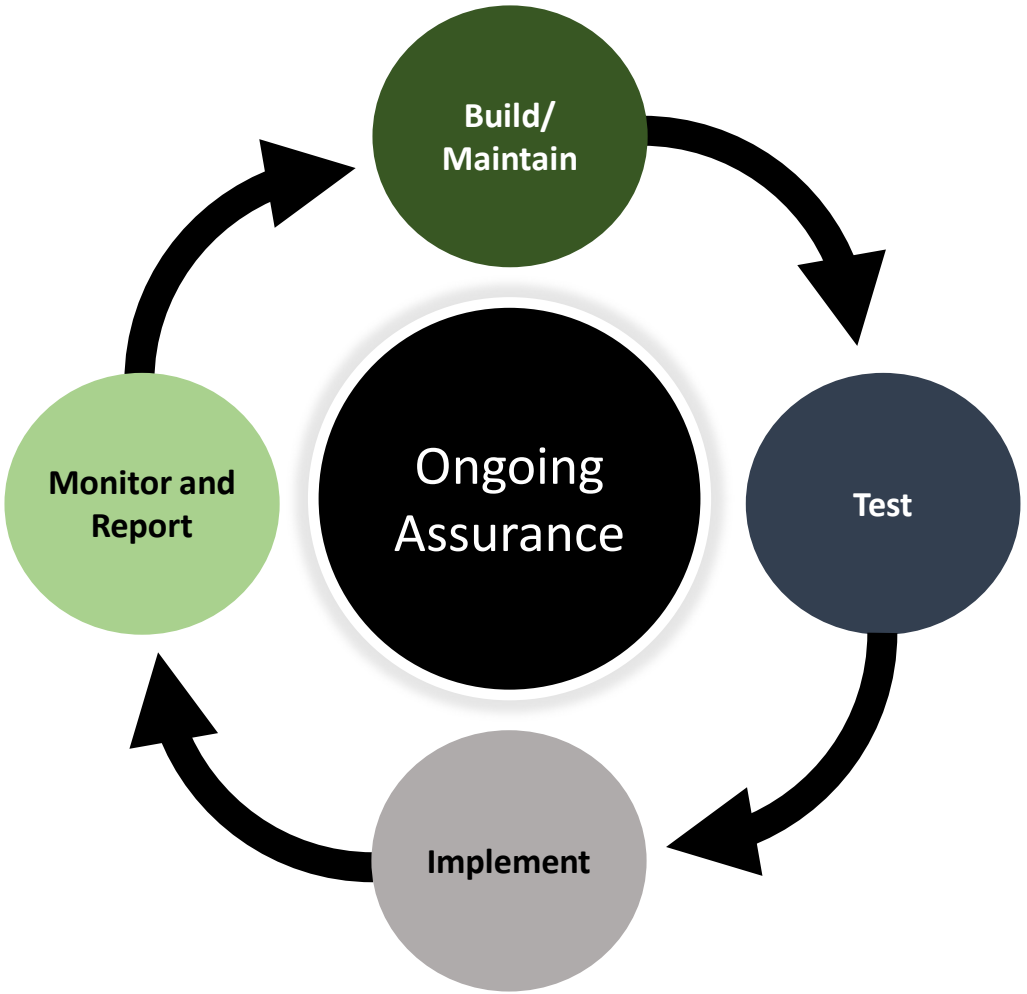
- Program Strengths: Tuition/Fee validation check for each billing period
- Immaterial error in fee table set-up for board designated tuition for intercollege elective courses with different start dates/timing, outside a student's career program
- Refunds/Credits were issued for errors and students were made whole
- Fee tables have been corrected

HSC College	Records	Gross Tuition/Fees[1]	Errors	Errors % of T&F
Texas College of Osteopathic Medicine	935	$6,830,928	0	0.000%
College of Pharmacy	349	$2,785,211	$5,078	0.182%
School of Biomedical Sciences	498	$1,887,304	$4,140[2]	0.219%
School of Public Health	254	$691,392	0	0.000%
School of Health Professions	404	$2,118,264	$120	0.006%
Total	**2440**	**$14,313,098**	**$9,338**	**0.065%**

[1] Unaudited financial information from internal systems
[2] Undercharge (negative value) shown in absolute value

Common Challenges

The audit team experienced challenges in all phases of ongoing assurance



- **Data quality**
- **Decentralized environments**
- **Excessive volumes of data need to reperform calculation**

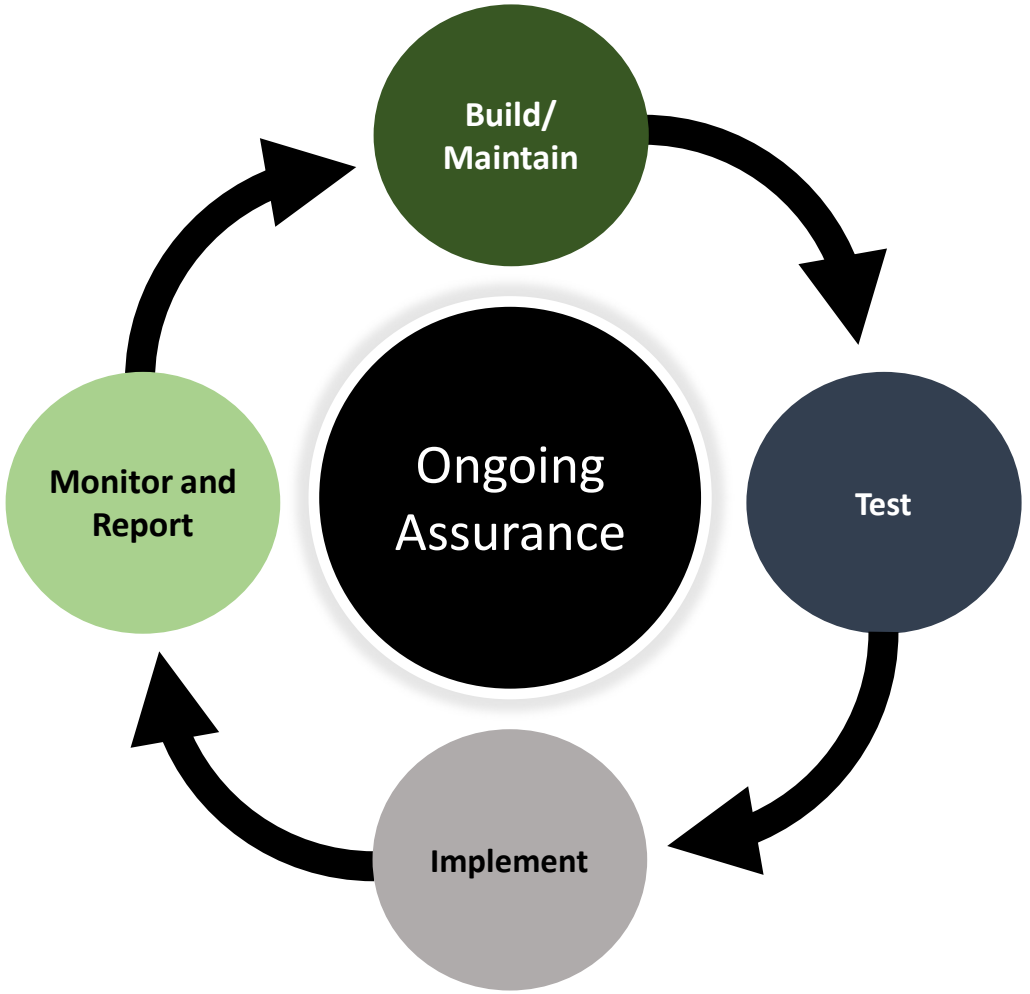
- **False positives**
- **Auditees are busy and may have limited time to pull data or meet to discuss anomalies (i.e., blackout periods)**

- **Difficulty accessing data**
- **Lengthy process to approve use of audit analytics tools in database**

- **Determining which issues met materiality and warrant reporting**

Reporting : Common Errors

Over the years, Internal Audit has routinely identified errors in billing. The magnitude and frequency of errors have declined since the start of the program.



- Unusual enrollment scenarios / enrollment errors
- Rates not up-to-date on tuition and fees website
- Change in differential tuition charges between colleges causing overcharges
- Student enrolled in two college degree programs resulting in duplicate charges
- Billing logic conflict due to student taking course outside of official academic year

ROOT CAUSE:

- ✓ ERROR IN FEE SET-UP
- ✓ NO CONTROL TO VALIDATE CHANGES TO TUITION AND FEE STRUCTURE

Why Audit Tuition & Fees?

Tuition and fees are a significant revenue source. Additionally, billing errors can lead to reputational damage.

FY23 - Revenues, Expenses, and Transfers - Current Funds

Consolidated Q4 Report

All $ presented as thousands

UNT SYSTEM™

	FY22 Actuals	FY23 Budget	FY23 Actuals	Budget vs. Actuals Variance ($000's)	Budget vs. Actuals Variance (%)	Ref. No.
REVENUES						
Net Tuition and Fees	451,754	487,720	509,423	21,702	4%	3
Sales of Goods and Services	158,322	150,698	159,287	8,588	6%	
Grants and Contracts	275,072	262,867	280,389	17,522	7%	4
State Appropriations	304,560	303,849	305,049	1,200	0%	
All Other Revenue	126,486	99,506	133,231	33,725	34%	5
Total Revenues	**1,316,194**	**1,304,641**	**1,387,379**	**82,738**	**6%**	2
EXPENSES						
Personnel Costs	658,715	711,801	707,101	(4,699)	-1%	
Maintenance & Operation Costs	277,472	262,004	326,167	64,163	24%	8
Scholarships, Exemptions and Financial Aid	137,313	115,213	139,071	23,858	21%	
All Other Expenses	25,763	115,620	29,183	(86,437)	-75%	7
Total Expenses	**1,099,263**	**1,204,638**	**1,201,522**	**(3,116)**	**0%**	6
TRANSFERS						
Total Net Transfers	**(133,623)**	**(98,906)**	**(120,042)**	**(21,136)**	**21%**	9
Total Expenses and Net Transfers	**1,232,886**	**1,303,544**	**1,321,564**	**18,020**	**1%**	
Estimated Budgeted Impact on Fund Balances	**83,308**	**1,097**	**65,815**	**64,718**	**5901%**	1

Source: UNT System November 2023 Quarterly Operations Report

UW-OSHKOSH | UNPAID TUITION

UW-Oshkosh MBA students thought their tuition was paid in full. Then new bills came for $8,000

Source: Wisconsin State Journal (madison.com/news/local/education/university/uw-oshkosh-mba/article_9ca5971e-3c5e-11ee-8b7a-6f03ca521e3c.html)

UW-OSHKOSH | BILLING ERROR

UW-Oshkosh denies students' requests to forgive surprise, post-graduation tuition

Source: Wisconsin State Journal (madison.com/news/local/education/university/uw-oshkosh-tuition-forgiveness/article_82ec3fe4-4c1c-11ee-99e3-c3e07acfc72e.html)

Internal Audit & Data Analytics Strategy

Advanced Analytics

ENABLING TECHNOLOGY

Advanced Analytics Technology Considerations

Analytics and Data Management Tools

- Data discovery and data ingestion
- Data preparation, digestion, data quality profiling and analytics
- Execution analytics / analytics process automation
- Data visualization and reporting, deploy at scale
- Self-service analytics enablement with built-in algorithms and functions

Environment and Data Accessibility Requirements

- Native connectors, direct access (pull) or reliance on others to push a report or extract
- Establish IA environment (sandbox) for working with large datasets and running continuous / reusable automation
- Build or access other data lakes or existing data warehouse environments

Key Questions for Internal Audit

Consider the following questions within your overall strategy:

- What are our overall objectives for data analytics?
- What are the IA team's skills and capabilities (and knowledge gaps) related to analytics?
- What other skills and capabilities (and tools) exist in the business?
- Which systems and data best suited for an analytics pilot (quick-win)?
- Which parts of the audit lifecycle are the best candidates for analytics (risk assessment & planning, project scoping, fieldwork, reporting, follow-up)?

Audit Analytics Use Case Overview

Below is a sample of Internal Audit Analytics use cases we have helped identify, design and build, using a combination of technologies including but not limited to analytic automation and data visualization tools.

Stand-up or Accelerate Data Analytics Program

- DA Program Assessment
- Strategy and Roadmap
- Data Literacy Training
- DA Program Accelerators
- CM/CA Stand-Up

Business Process Controls Analytics

Both core & support processes

- FSI Analytics
- AML/BSA Analytics
- Process: AR/Receivables
- AP/Payments
- Payroll Analytics
- Month-end close
- User / Admin Access Reviews
- Two- or Three-Way Match

Other Internal Audit Use Cases and Accelerators

- Risk Assessment & Dynamic Planning
- Audit Management Dashboard
- Smart Sampling
- Tracking and Monitoring KPIs/KRIs

ANALYTICS INTEGRATED INTO EACH AUDIT STEP

Next Gen IA Analytics should go beyond a discrete step during the audit fieldwork phase…

Prep	Fieldwork			Reporting		
1. Project Resource Assignment and Planning	**2. Fieldwork Kickoff**	**3. Execute and Oversee Fieldwork**	**4. Validate and Communicate Findings**	**5. Draft Report**	**6. Audit Closing and Reporting**	**7. Track and Communicate Value**
Understand relevant data (including external data) Mine for risk insights Establish data capture approach Develop analytics concept	Acquire and prepare data for analysis Finalize analytics plan	Execute analytics plan Be flexible… follow the data	Conduct thorough QA Create/Share visualizations and reports Prepare for handoff to management	Data analytics finalized Determine continuous monitoring options	Handoff to management	Track, and communicate value delivered by analytics (efficiency, effectiveness, and business insights)

…it should be embedded into every step.

Data Visualization and Dashboarding

Situation:

An organization faces challenges in efficiently accessing, interpreting, and communicating complex financial data, necessitating user-friendly, real-time visualization tools

Solution:

Approach

- Design and develop tailored interactive dashboards that provide a comprehensive, real-time view of critical financial metrics and indicators
- Focus on user experience and accessibility in dashboard design, ensuring ease of use for a range of stakeholders
- Ensure seamless integration of dashboards with client's various data sources for real-time data retrieval and display
- Provide comprehensive training to employees on how to use the dashboards effectively, along with ongoing technical support

Deliverables

- A set of customizable, interactive dashboards that visually represent key business metrics in real-time
- Detailed user guides and documentation to assist stakeholders in navigating and utilizing the dashboards
- A framework for integrating the dashboards with existing data management systems and workflows

Value Delivered:

- Improved visibility into key metrics, facilitating quick identification of areas needing attention
- Enhanced capability for data-driven decision-making based on real-time insights
- Streamlined communication of complex data findings to stakeholders, aiding in strategic planning and operational management

Regulatory Compliance Monitoring

Situation:

An organization faces difficulties in staying abreast of and complying with the ever-changing regulatory landscape across different regions, necessitating an automated and comprehensive compliance monitoring system

Solution:

Approach

- Implement an automated system to continuously track and update changes in global regulatory requirements
- Develop algorithms and tools to automatically assess the bank's compliance status against these regulations
- Ensure seamless integration of the compliance monitoring tools with the bank's existing risk management and reporting systems
- Provide training to the compliance team on utilizing and maintaining the new system, along with regular updates on regulatory changes

Deliverables

- A sophisticated software solution capable of real-time tracking of regulatory changes and assessing compliance status
- Regular, automated reports highlighting compliance status, potential risks, and areas needing attention
- A detailed plan for integrating the compliance monitoring tool with existing systems and workflows

Value Delivered:

- Improved ability to adhere to various regulatory requirements, reducing the risk of non-compliance penalties
- Streamlined and more efficient compliance monitoring processes, saving time and resources
- Enhanced capability to proactively manage compliance, adapting quickly to regulatory changes and maintaining operational integrity

IADA Department – Application & Project Examples

Value: Full population testing, fast access to information through keyword search, money saved through process automation, and streamlined reporting.

Project Examples

1. **Automation of control testing and monitoring** of move money transactions and customer account updates to ensure accuracy, completeness, and timeliness.
2. **Development of a text mining application for keyword matches** within consumer complaint reports to identify improper documentation, mishandling, and/or inability to resolve client complaints leading to increased compliance, legal, reputational, and financial risk.
3. **Development of an Object/Optical Character Recognition/ Natural Language Processing application** to identify external adverse events (consent orders, regulatory fines, lawsuits, complaints, etc.) to determine and respond to potentially relevant exposures and issue action plans.

Methodology:

Our Approach:

- Meet with the audit team, business stakeholders to understand data and controls
- Determine how to obtain data (i.e., via tabular files, via direct connection to databases, data lakes, data warehouses, etc.)
- Deliver a Data Request List tailored to the project
- Determine which technologies/ tools could be leveraged for that specific project. (SQL, Python, Tableau, etc.)
- Develop scripts, data workflows, and/or dashboards that fulfill the project objectives
- Discuss outliers and potential findings with the audit team

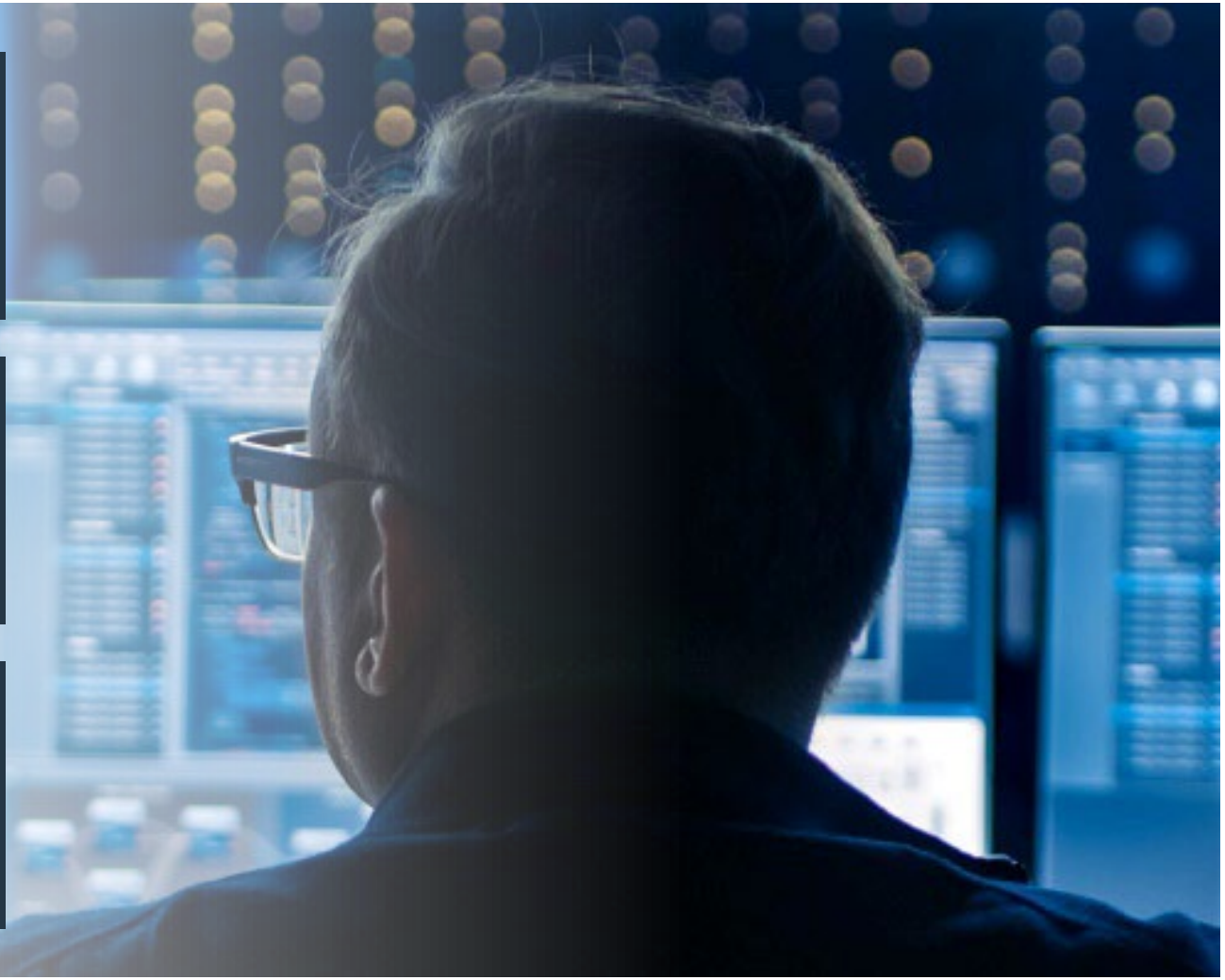
Value Delivered:

Benefits Achieved:

1. **Automation of control testing and monitoring**
   - Tested full populations to mitigate risks associated with a sampling approach
   - Identified transaction outliers, monthly average transaction volumes, tested transaction authorization limits
   - Data analytics documentation provided to audit team as supporting documentation and additional details of workflows
2. **Text mining application**
   - Delivered a keyword match search GUI
   - Identified complaint case resolution lengths, overall case monthly volumes, categorized complaint cases, employee listings associated with keywords matched
3. **OCR/NLP Application**
   - Deliver periodic external adverse event reports with relevant extracts from FinCEN, SEC, FINRA, OCC, amongst others

Skill Sets of the “Auditor of Tomorrow”

- Core Internal Audit Practices
- Data Analytics & Visualization
- Evolving Risk Areas (e.g., cyber, cloud, ESG)
- Process Decomposition and Analysis
- Soft Skills & Continuous Learning Mindset
- Emerging Technologies (AI/ML, Automation, Quantum)



Questions?

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