



*Enhancing the
Audit of the Future*

Robotic Process Automation - Innovation in Internal Audit

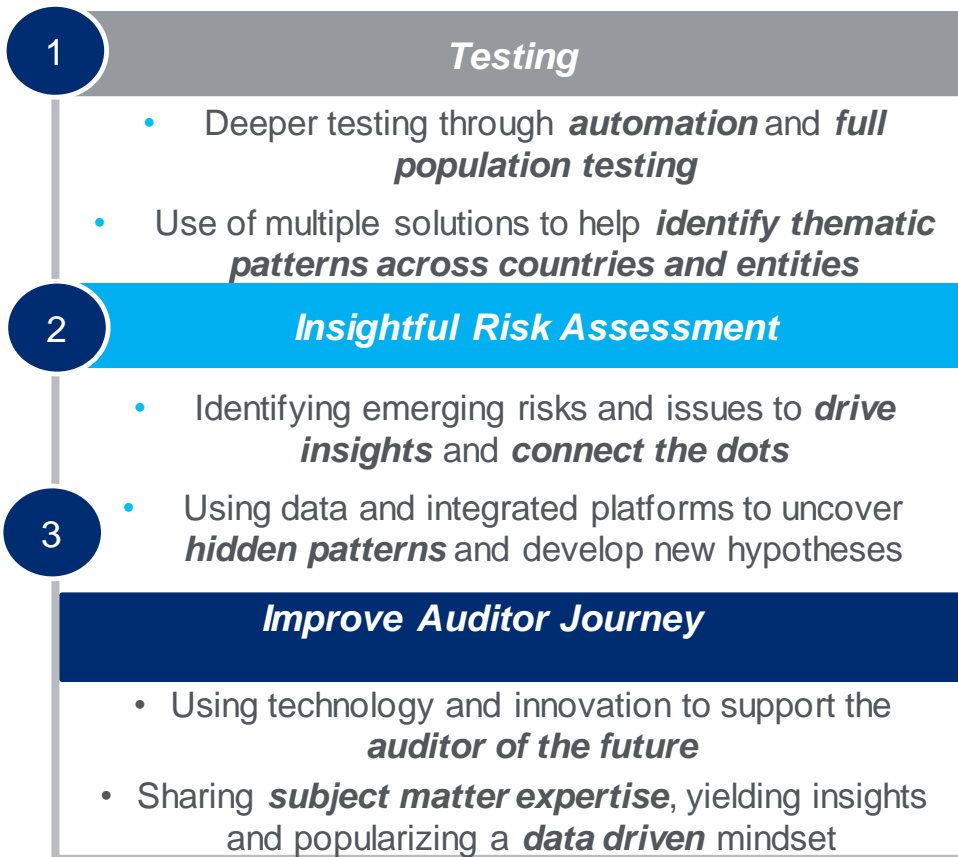
Chris Long, Head of Audit – Hong Kong - Citibank

June 3, 2019



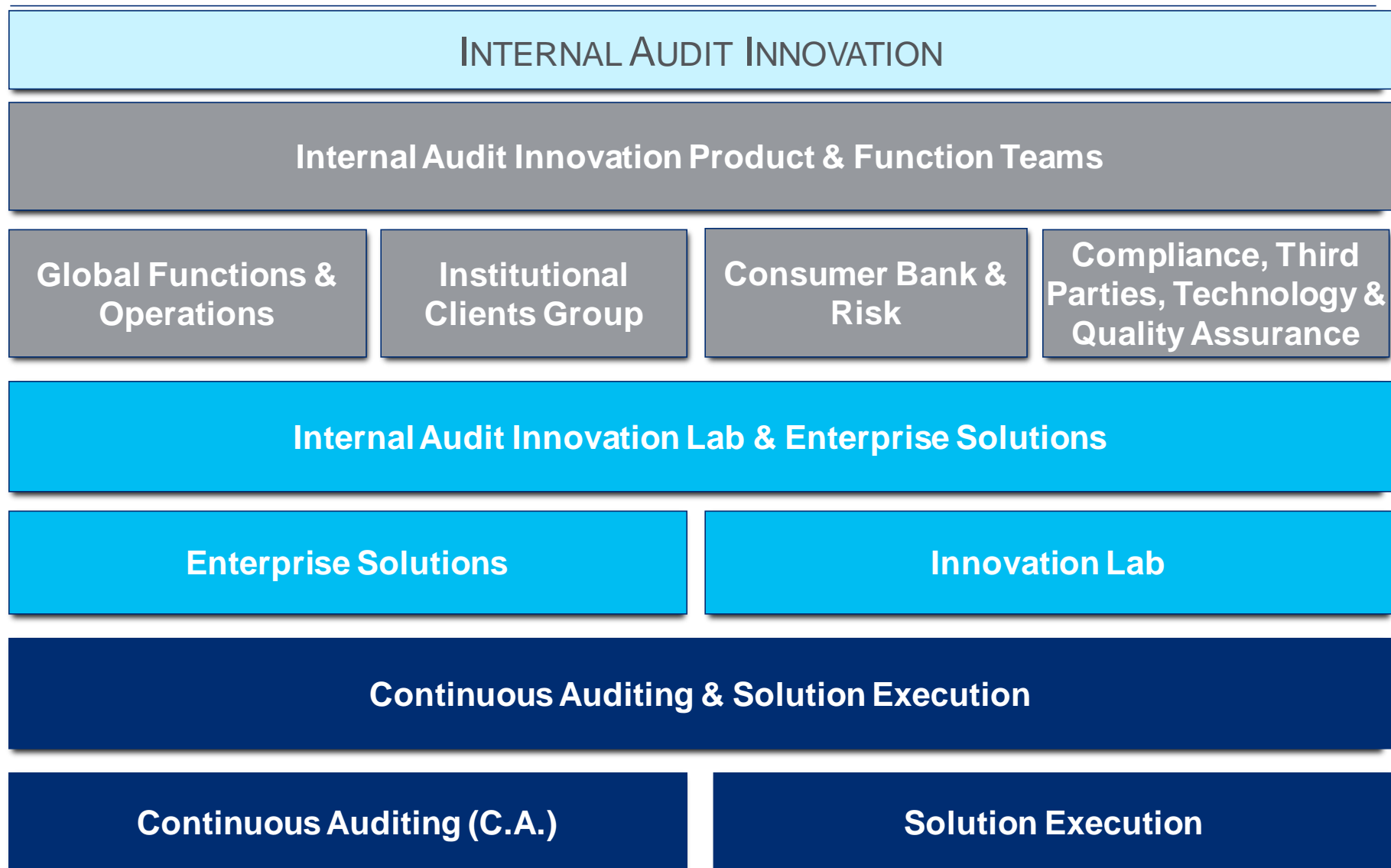
Introduction to Audit Innovation – The Mission

SMARTER AUDITING – SIGNIFICANTLY IMPROVE THE CONTROL ENVIRONMENT AND ASSURANCE THROUGH LARGE POPULATION TESTING, ANOMALY DETECTION, AND NEW TECHNIQUES



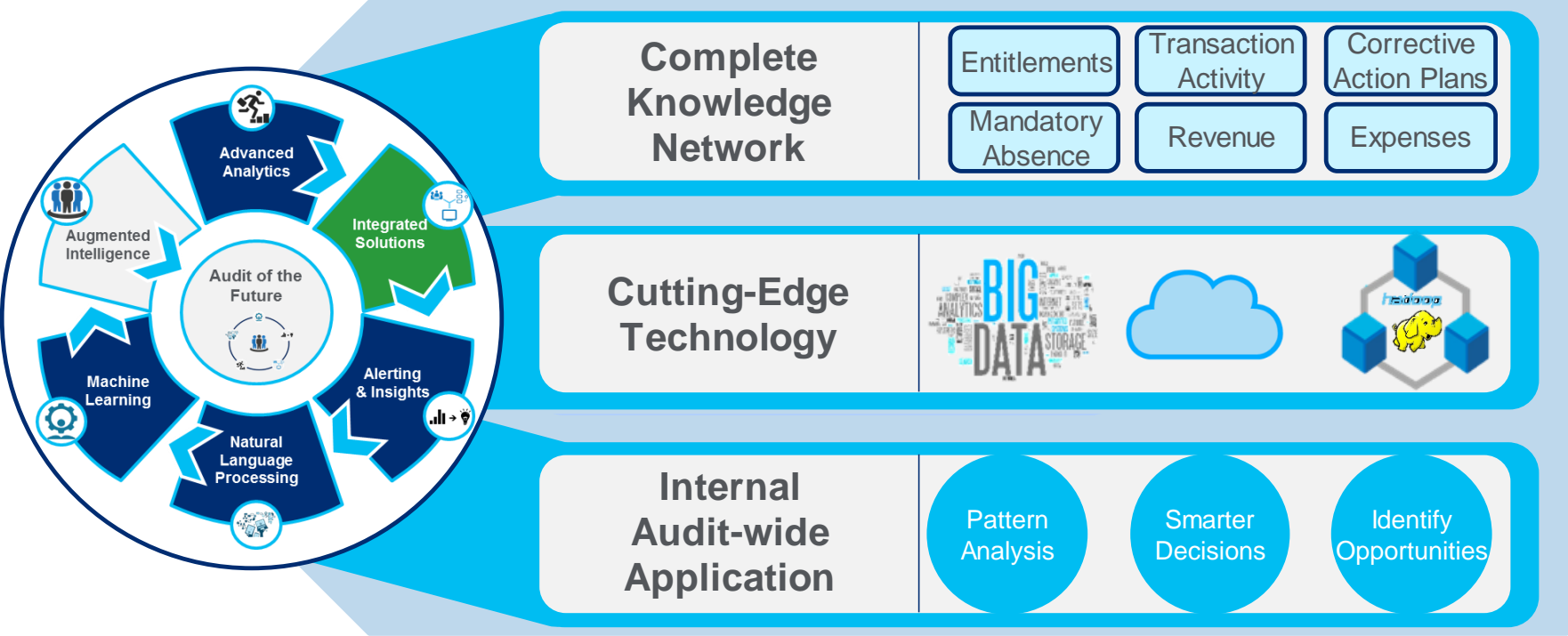
IMPROVE ASSURANCE, DRIVE POSITIVE CHANGE, AND BE THE BEST FOR OUR CLIENTS

Internal Audit Innovation – The Team



Integrated Solutions

MOVING FROM SOLUTIONS AND DATA IN SILOS TO AN INTEGRATED PLATFORM

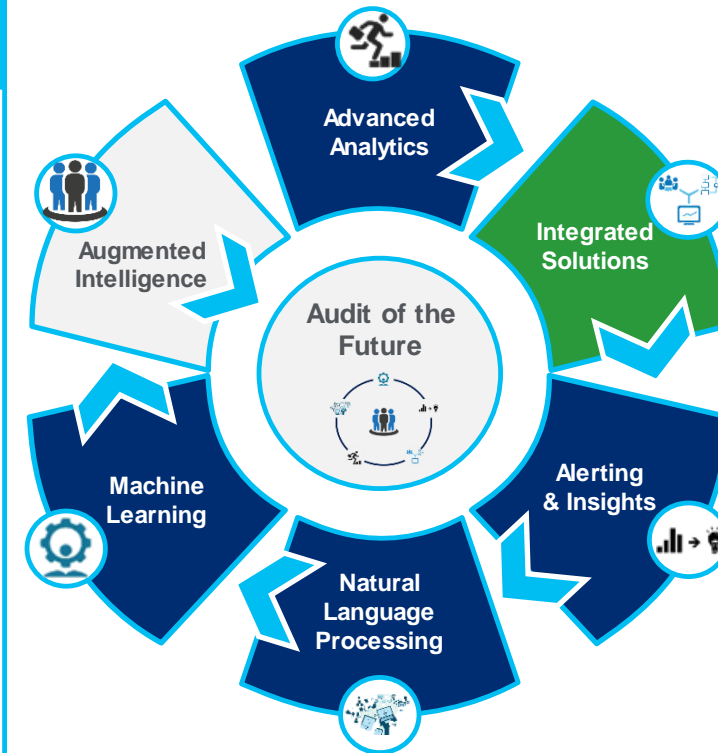


ALLOWS FOR ABILITY TO MINE FOR HIDDEN PATTERNS AND DEVELOP A COMPLEX KNOWLEDGE FRAMEWORK

Integrated Solutions

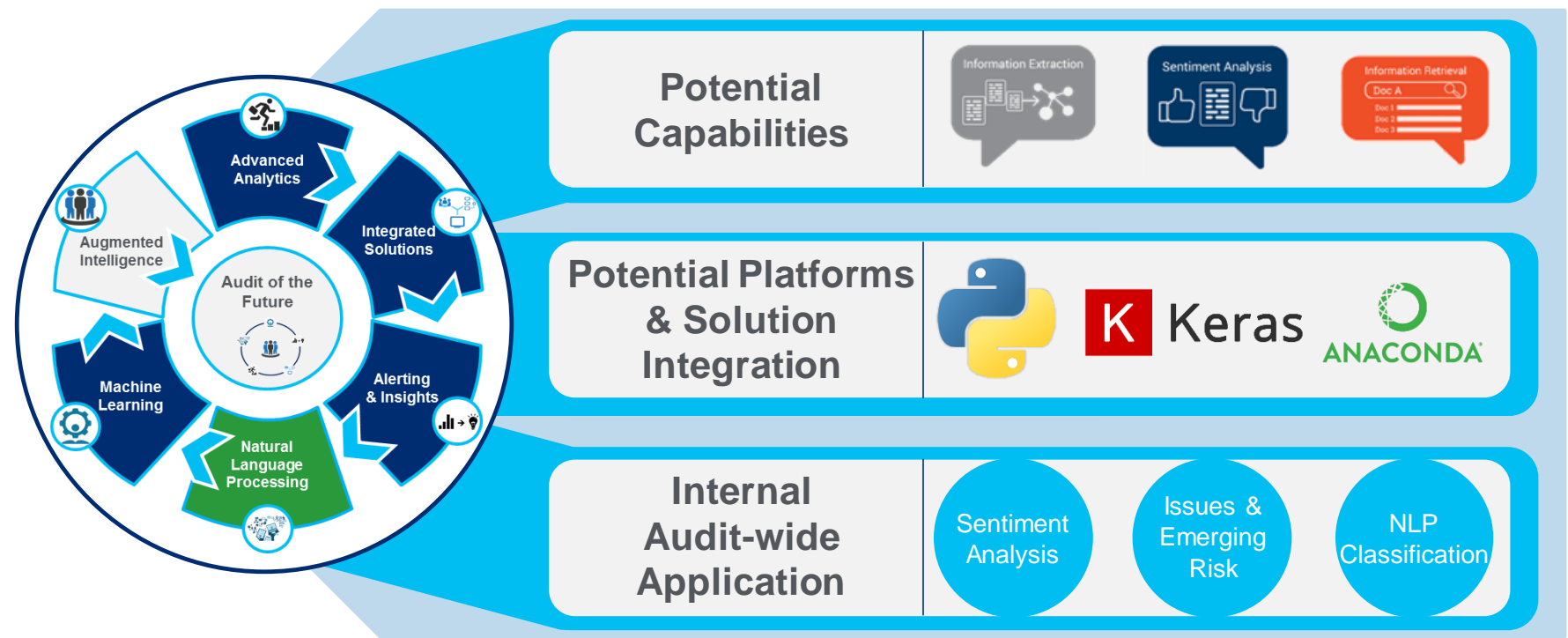
EXAMPLE – USER ACCESS

Problem Statement	Solution	Benefits
Pain Points <ul style="list-style-type: none">• Incorrect systems access, jeopardizes control• Manual testing limited in scale / time consuming to execute• Testing as part of cycled audits, may not identify errors timely• Inconsistent testing approach	<u>Online Entitlement Solution</u> <ul style="list-style-type: none">❖ Solution available on web platform❖ Live Data feed from systems❖ Population based on person / team❖ Testing can be scheduled to run automatically (results sent to email address of requestor)❖ Toxic entitlements / unapproved access	Features <ul style="list-style-type: none">❖ Issues reported and corrected between audits❖ Tools can be used by all teams❖ Millions of user entitlements tested annually❖ Web-enabled reports - create & share anytime❖ Clearer understanding between auditor and auditee.



Natural Language Processing

USING THEMATIC ANALYSIS TO IDENTIFY EMERGING RISKS AND REGULATORY POLICY MATCHING



IMPROVING THE AUDITOR JOURNEY AND PROVIDING INSIGHTFUL RISK ASSESSMENT

Natural Language Processing

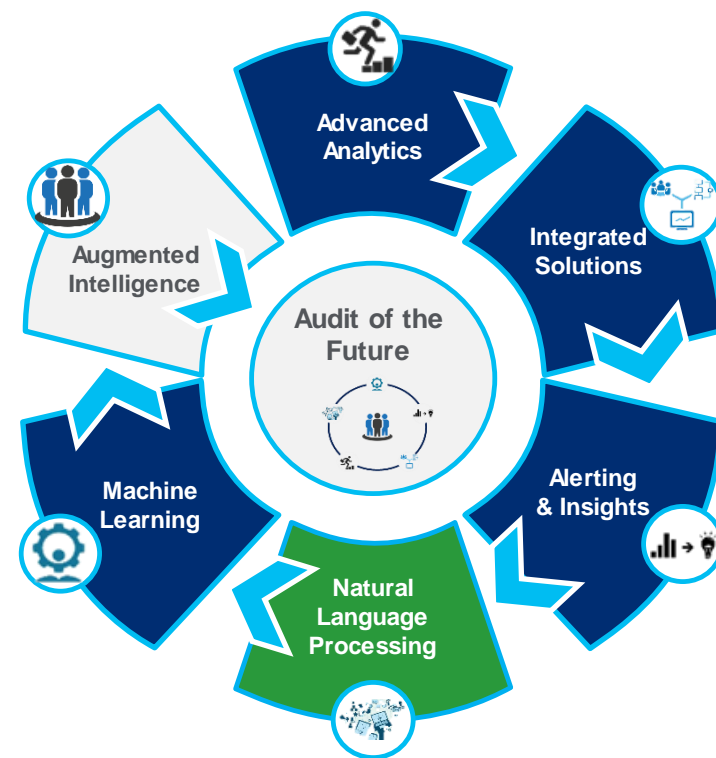
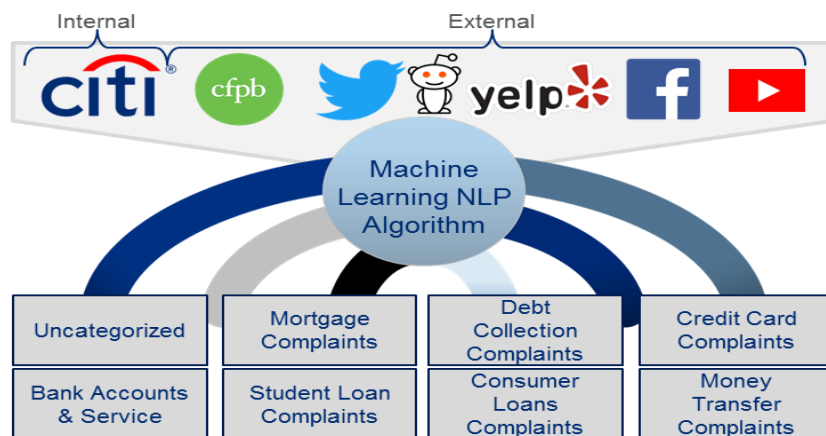
EXAMPLE - COMPLAINTS

Consumer Complaints Overview

Utilizing advanced analytics **algorithms** (e.g., Machine Learning & Natural Language Processing) to create a **regulatory lens** for our review of **emerging risks** based on various channels of complaints information

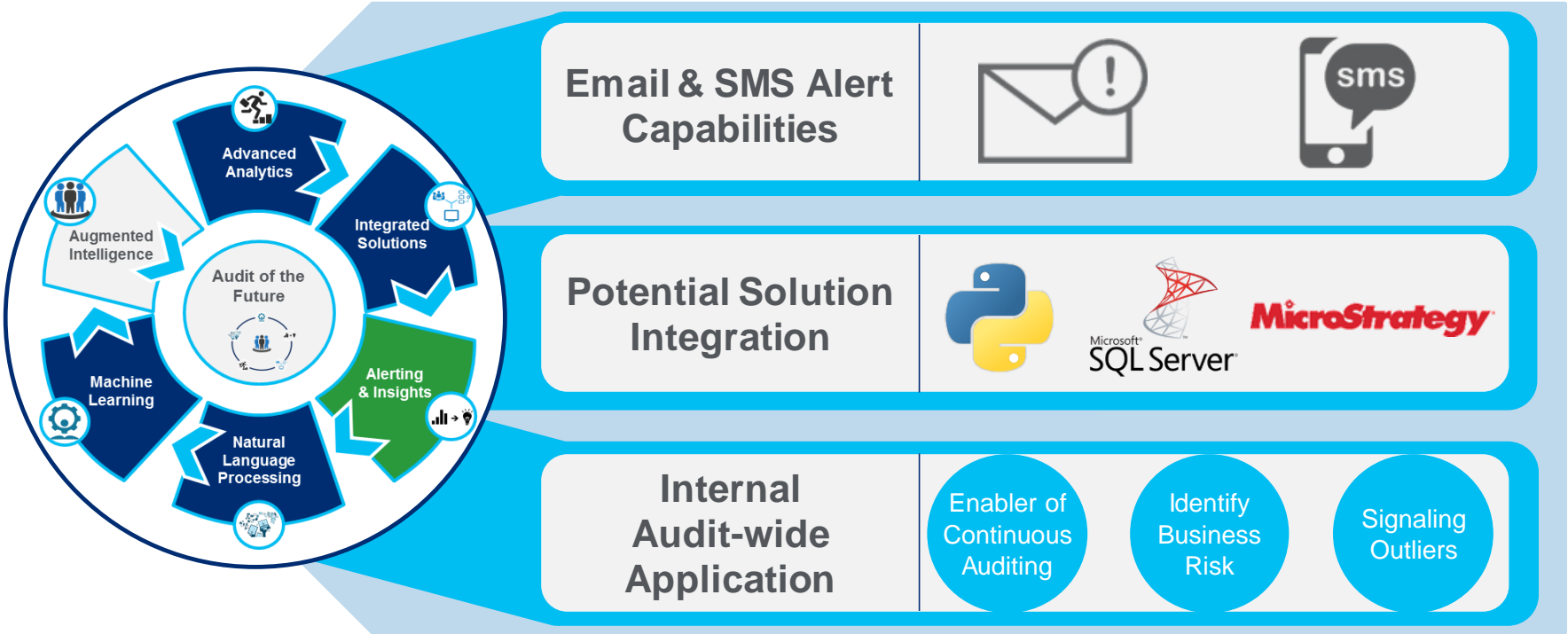
Benefits

- | | |
|--|---|
| <ul style="list-style-type: none">• Time save from automated classification• Textual Data Visualization• Identify Emerging Risks<ul style="list-style-type: none">• Reputational Risk Management | <ul style="list-style-type: none">• Trigger Auditor Reviews• Improve Stakeholders / Customer satisfaction• Insights brought back to the Product Teams |
|--|---|



Alerting and Insights

KNOWLEDGE AT A MOMENT'S NOTICE

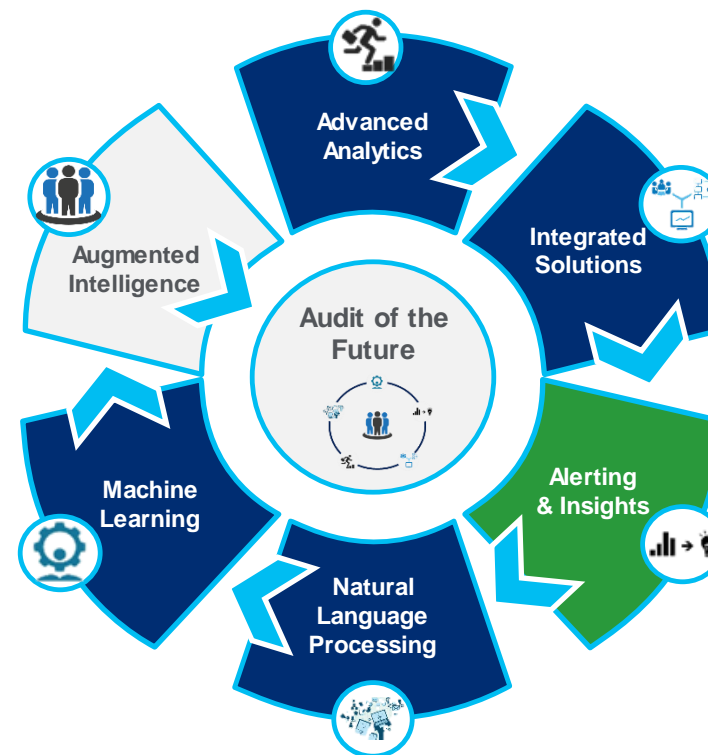


FASTER ACTION DRIVEN SOLUTIONS

Alerting and Insights

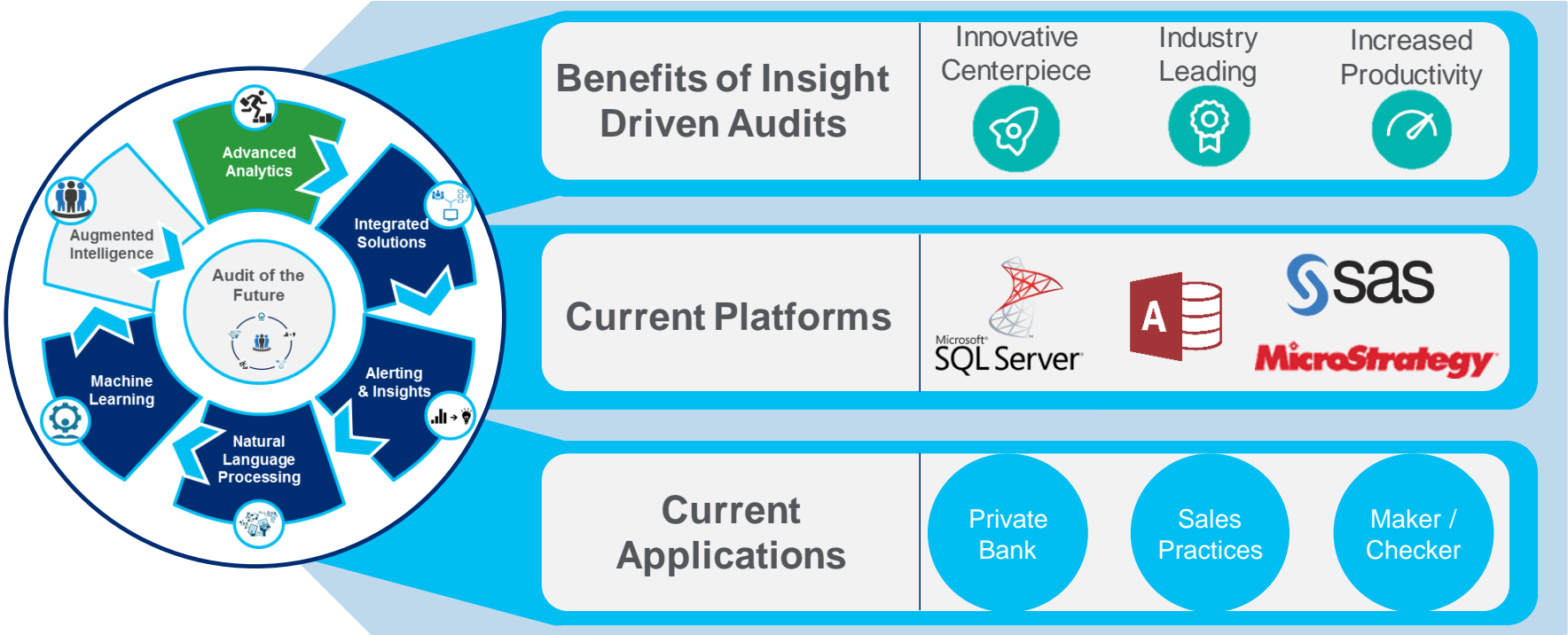
EXAMPLE – AUDIT 360 (ONLINE PLATFORM)

Problem Statement	Solution	Benefits
Pain Points <ul style="list-style-type: none">• Lack of centralized brand• Analytics performed in siloes• Availability of solutions• No single aggregation platform for solutions• Lack of customization	Audit 360 <ul style="list-style-type: none">❖ A one stop shop for Innovation and Insights❖ Initially launched on February 12th, 2018❖ Additional updates to be rolled out on a consistent basis	Features <ul style="list-style-type: none">❖ Google-esque search❖ Personalized dashboard settings❖ Customized threshold monitoring & alerting❖ On-Demand & Continuous Auditing scheduling



Continuous Auditing – Advanced Analytics

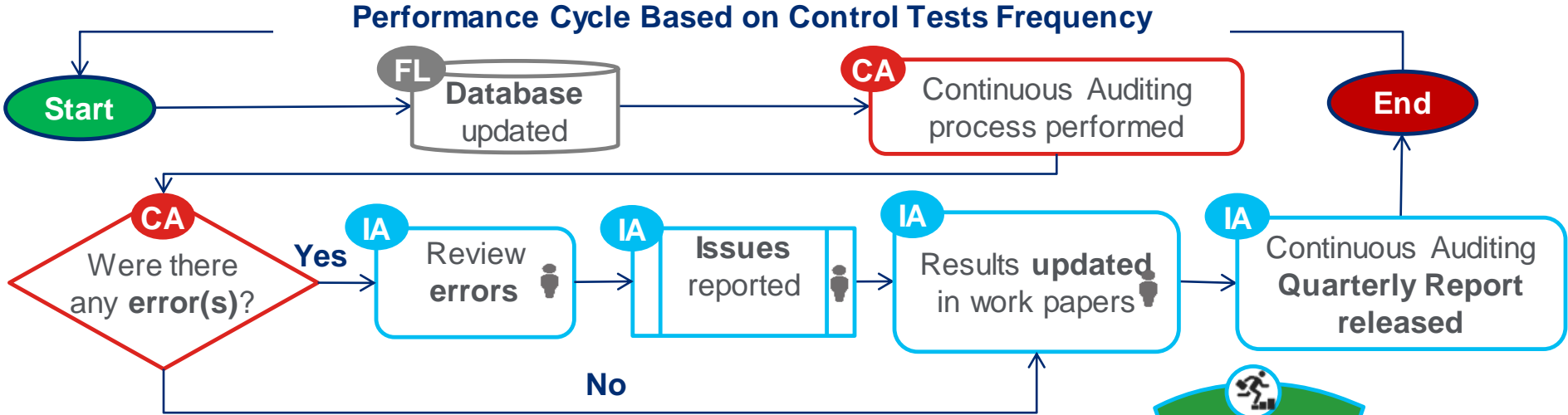
AUDIT FUELED BY INNOVATION



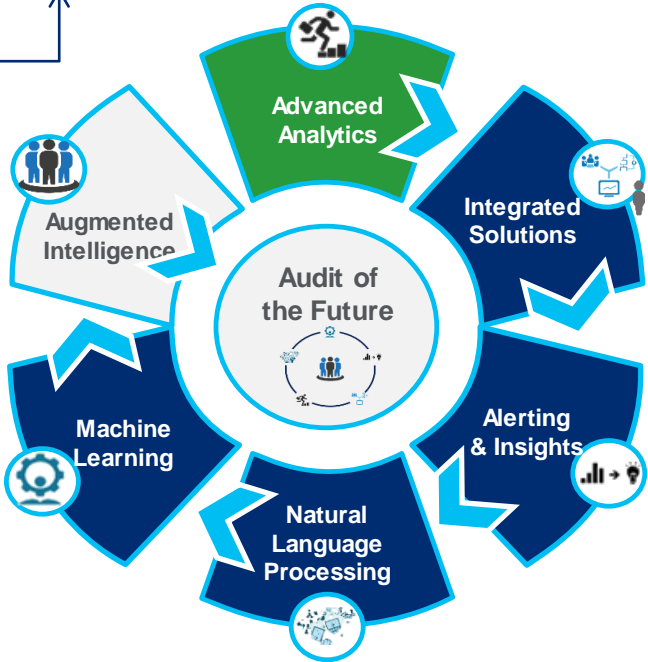
GENERATING NEW INSIGHTS, GREATER ASSURANCE AND DISRUPTING TRADITIONAL AUDIT TECHNIQUES

Continuous Auditing - Advanced Analytics

EXAMPLE – CONTINUOUS AUDITING

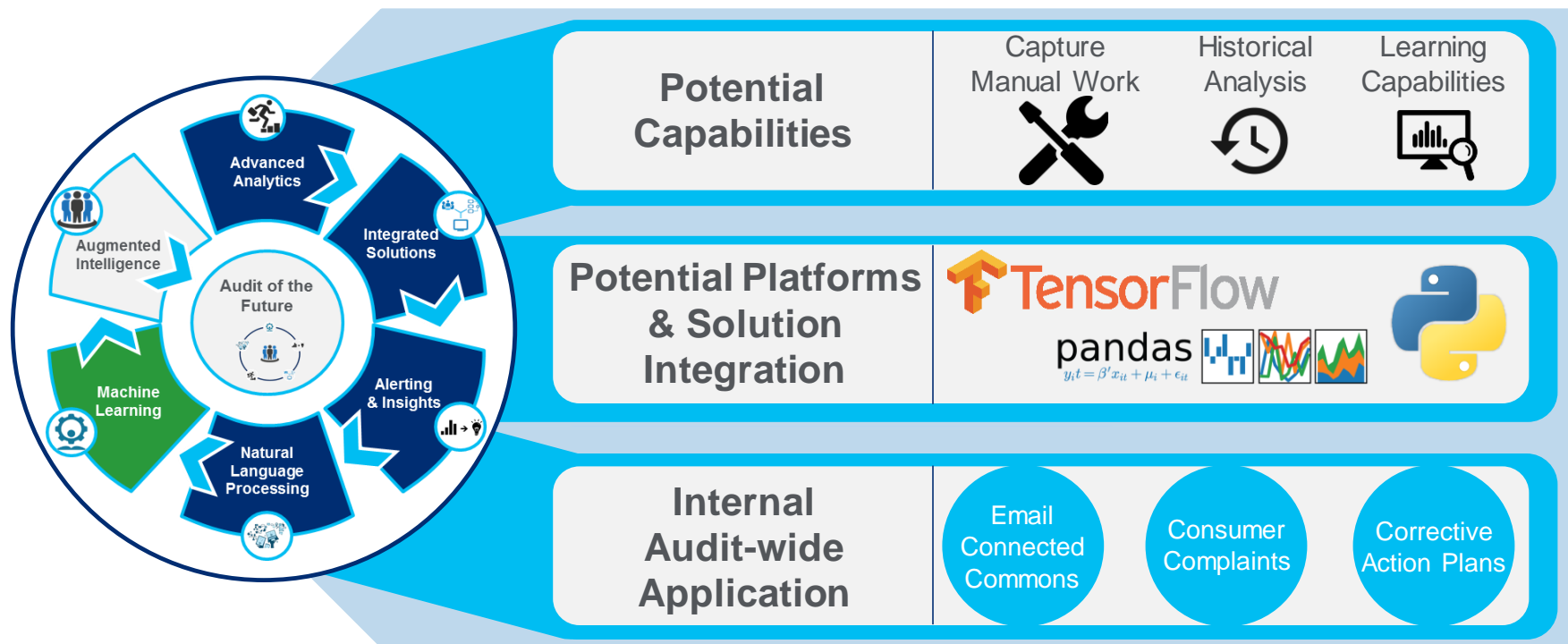


Continuous Auditing Maker / Checker Example	
Risk Based	Continuous Auditing
<ul style="list-style-type: none">• 40 samples tested per Audit• ~20 Audits per year• ~60 min per record• 4,680 years for full population• 0 Exceptions Identified• 1 Entity Impacted	<ul style="list-style-type: none">• 40 MM records per year• 1 test monthly• 15 ms per record• 20 Exceptions identified• 20 Entities impacted



Machine Learning

SYSTEMIC DECISION-MAKING BASED ON TRAINED ALGORITHMS



ANALYZING HUNDREDS OF THOUSANDS OF DATA POINTS IN A MOMENT'S NOTICE THROUGH AUTOMATION

Machine Learning

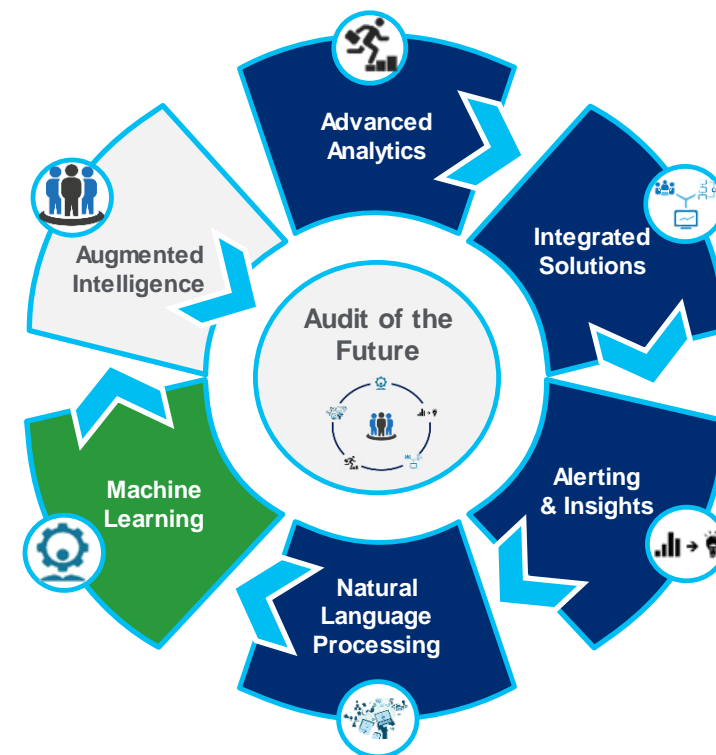
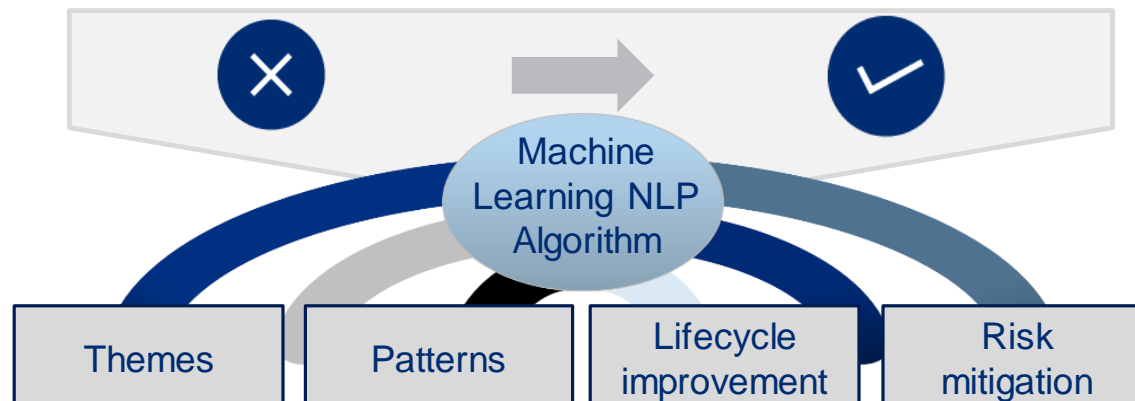
EXAMPLE – CORRECTIVE ACTIONS

Corrective Action Plans Overview

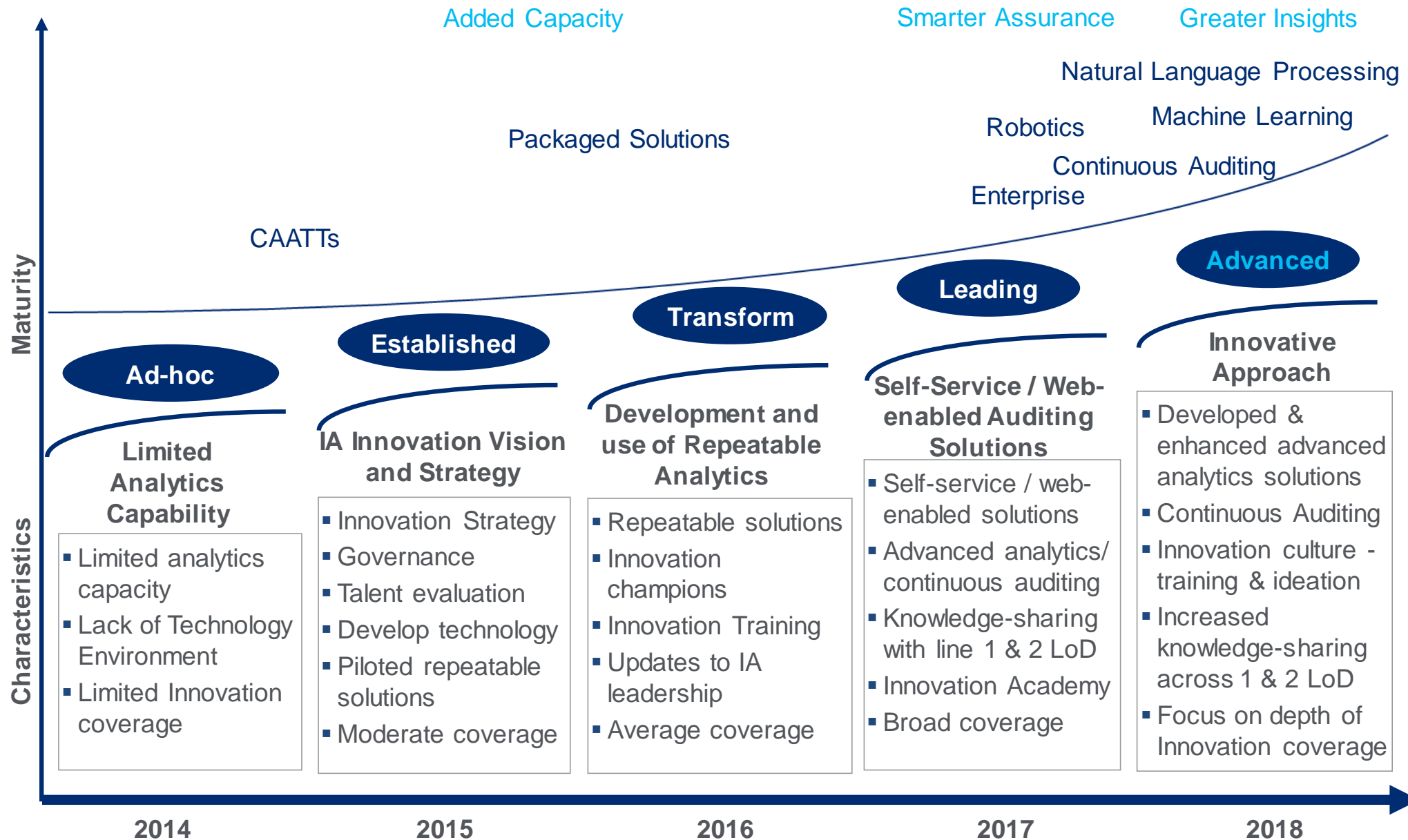
Application of advanced analytics **algorithms** to issues & corrective action plan data in order to attain **thematic insights** leading to better, deeper understanding of issues, opportunities to **improve issues lifecycle**, **prevention of recurring issues**, and improvement in the **stakeholder experience**

Benefits

- | | |
|--|--|
| <ul style="list-style-type: none">• Understand linkage among issues across businesses• Textual data visualization• Identification of emerging risks• Improvement in quality of issue narratives | <ul style="list-style-type: none">• Increased efficiency of issue lifecycle• Improve stakeholder satisfaction• Insights brought back to the Products |
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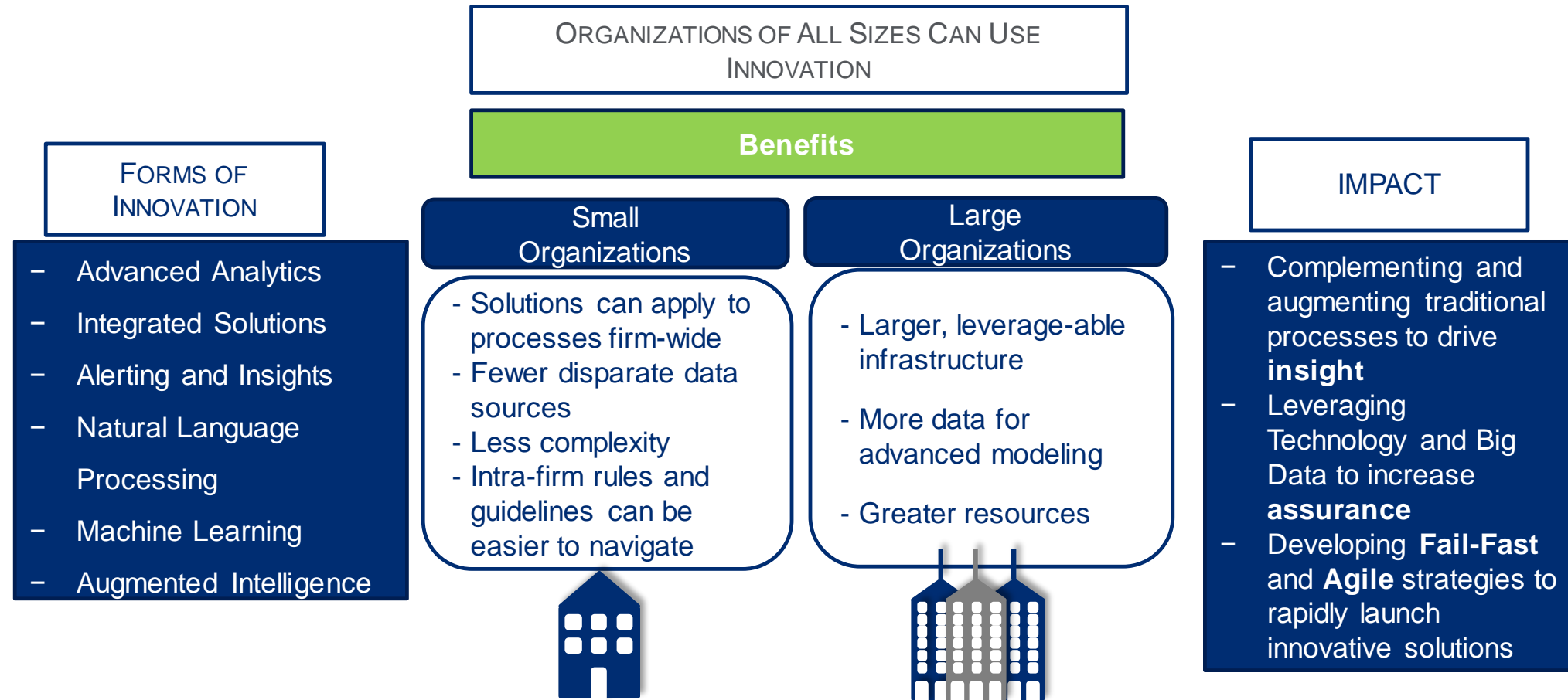
The Journey from Audit Analytics to Advanced Innovation



#DrivePositiveChange

Conclusion

AUDIT INNOVATION CAN TAKE MANY FORMS



INVEST IN THE POWER OF INNOVATION TO DRIVE EFFICIENCY AND EFFECTIVENESS THROUGHOUT YOUR AUDIT PROCESS



Thank You!