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TRANSFORMING...
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OUR WORKPLACE.
OUR PROFESSION.

INTELLIGENT AUTOMATION AND OTHER LEADING TECHNOLOGY CONSIDERATIONS FOR THE INTERNAL AUDITOR

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APRIL 9, 2018

WITH YOU TODAY

Clinton Peters, CPA, CIA, CFE

KPMG LLP, Director, Advisory Consulting, Internal Audit and Enterprise Risk

Clinton is a Director of KPMG's Chicago-based Internal Audit & Enterprise Risk (IA&ER) services practice with more than 14 years of public accounting and professional services experience. Clinton is adept at process reengineering and has gained extensive experience leading, managing and executing internal audit programs, internal control over financial reporting (ICOFR) programs, Sarbanes-Oxley 404 (SOX) programs, and risk assessment / risk management programs across a variety of industries. Clinton has also successfully developed and implemented internal audit functions and ICOFR functions for several leading global manufacturers.

As KPMG's designated Intelligent Automation Network Champion for the Midwest, Clinton is responsible for promoting awareness of intelligent automation and educating clients and KPMG professionals of the intelligent automation considerations for internal audit.

Kelly Combs

KPMG LLP, Manager, Advisory Consulting, Emerging Technology Risk Services

Kelly is a Manager in KPMG's Emerging Technology Risk practice with experience in Robotic Process Automation and Intelligent Automation Labor platforms. She has led and executed engagements across a range of industries and sectors including Technology, Media and Telecommunications, Manufacturing, Consumer Markets, and Healthcare. Kelly has also delivered a wide range of traditional and innovative solutions to her clients including emerging technologies (i.e., mobile, cloud, Intelligent Automation) risk assessments, technology enabled business process reviews and controls integration, IT audit support for Sarbanes Oxley and Financial Statement Audits, IT Internal Audit projects over emerging technologies, Service Organization Control (SOC) reporting, and various other risk and compliance related engagements. In addition, Kelly has experience with medium-large sized clients with complex IT environments (40+ systems).

AGENDA

Topic
1. Intelligent Automation Overview
2. Intelligent Automation and the Evolving Role of Internal Audit
3. Governance and Risk Management Considerations for the Intelligent Automation Lifecycle
4. Opportunities to Leverage Intelligent Automation in Internal Audit
5. Opportunities to Leverage Intelligent Automation in Internal Control Over Financial Reporting (ICFR)
6. Getting Started with Intelligent Automation

OBJECTIVES

- By the end of this course, you will be better prepared to add-value to your Internal Audit functions and/or organizations in the following ways:

  - Spreading awareness and advising key stakeholders of the important governance, risk and control considerations for implementing and maintaining automation technologies.

  - Identifying and realizing opportunities to leverage automation technologies across all three lines of defense, including Internal Audit.

  - Understanding and delivering Internal Audit's role in supporting your organization's intelligent automation vision, both as a consultant to the business and as an assurance provider to key stakeholders.

  - Strategically developing and positioning the internal audit function to evolve with the future needs of the business.

1. INTELLIGENT AUTOMATION OVERVIEW

INTRODUCTORY VIDEO

www.youtube.com/watch?v=amFe8WZP8DY

THE GROWING LANDSCAPE OF DIGITAL

Business process as a service

Blockchain and other distributive ledger/ database systems

Mobility solutions

Cloud services

Social media and collaborative technologies

Business intelligence/ analytical tools and advanced competencies in data science

Robotic process automation
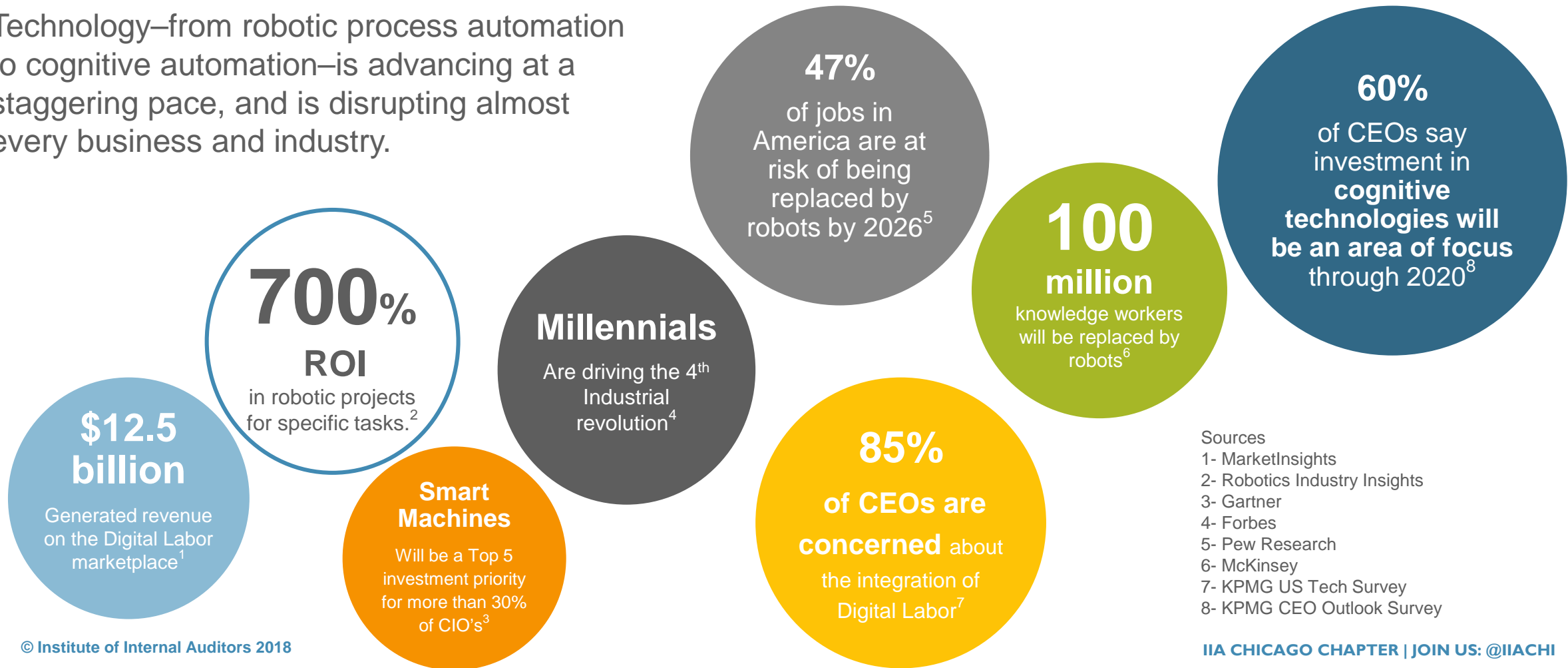- Basic
- Enhanced

Cognitive automation

Internet of things

Intelligent Automation

INTELLIGENT AUTOMATION IS HAPPENING NOW

Technology–from robotic process automation to cognitive automation–is advancing at a staggering pace, and is disrupting almost every business and industry.

47% of jobs in America are at risk of being replaced by robots by 2026[5]

60% of CEOs say investment in **cognitive technologies will be an area of focus** through 2020[8]

700% **ROI** in robotic projects for specific tasks.[2]

Millennials Are driving the 4th Industrial revolution[4]

100 million knowledge workers will be replaced by robots[6]

$12.5 billion Generated revenue on the Digital Labor marketplace[1]

Smart Machines Will be a Top 5 investment priority for more than 30% of CIO's[3]

85% **of CEOs are concerned** about the integration of Digital Labor[7]

Sources
1- MarketInsights
2- Robotics Industry Insights
3- Gartner
4- Forbes
5- Pew Research
6- McKinsey
7- KPMG US Tech Survey
8- KPMG CEO Outlook Survey

INTELLIGENT AUTOMATION, WHAT IS IT?

Business Process Automation?

Robotic Process Automation?

Natural Language Processing?

Machine Learning?

Artificial Intelligence?

Cognitive?

Digital Labor?

INTELLIGENT AUTOMATION, WHAT IS IT?

Often referred to as the "New Industrial Revolution," Intelligent Automation leverages data and analytics, robotic, cognitive, and artificial intelligence technologies to automate activities, from routine business process activities to complex knowledge work.

Common Benefits of Intelligent Automation:

Reduced Cost, Greater Cost-Effectiveness

Increased Speed and Capacity

Increased Quality and Accuracy

Skilled Human Professionals Empowered to Generate Impactful Insights and Smarter, Faster Decisions

Enable Continuous Monitoring

Improved Control

SOME OF THE DRIVING FORCES FOR INTELLIGENT AUTOMATION

Cost Efficiency
Estimated ROI:
40-80% cost take out for relevant functions
1 Automated FTE equivalent to 2-7 FTE
Onshore return: -10x Offshore rectum: -3x

Consistency & Predictability
Software robots do not make inconsistent decisions. They are configured to solve a problem the same way every time.

Quality & Reliability
Software robots do what you tell them to do. When property configured they do not make mistakes and thereby eliminate human error

Productivity & Performance
Software robots work 24/7,365. They do not take vacations, get sick, suffer from work/life balance, and perform tasks at digital speed,

Scalability
Cognitive systems can learn from top company performers and quickly transfer learnings other employees. This knowledge scaling is invaluable

Employee Satisfaction
Eliminating repetitive tasks allows employees to focus on more profound strategic initiatives, increasing job satisfaction

Auditability
Software robots keep the perfect audit trail a fie built by the software that documents every action it took and the corresponding result.

Transformation and Innovation

INTELLIGENT AUTOMATION SPECTRUM

A spectrum of technology that enables automation

Class 1
Basic Process Automation

Automation of entry-level, transactional, rule-based, & repeatable processes

Key Features	Macro-based	Unstructured Data	Natural Language Processing	Knowledge Base	Adaptive Alteration
	✓				
	Predictive Analytics	Machine Learning	Reasoning	Large-scale Processing	Big Data Analytics

Example: A US-based online bank has used RPA to automate tier 1 inquiries (i.e., address change)

Class 2
Enhanced Process Automation

Technology that enables use of structured and some unstructured data to support elements of self learning

Key Features	Macro-based	Unstructured Data	Natural Language Processing	Knowledge Base	Adaptive Alteration
		✓	✓	✓	
	Predictive Analytics	Machine Learning	Reasoning	Large-scale Processing	Big Data Analytics
		✓		✓	

Example: An energy company utilized all and advanced semantic reasoning to deploy a virtual service desk agent (click to chat) to rapidly understand questions, provide customers with answers, and escalate to humans if needed
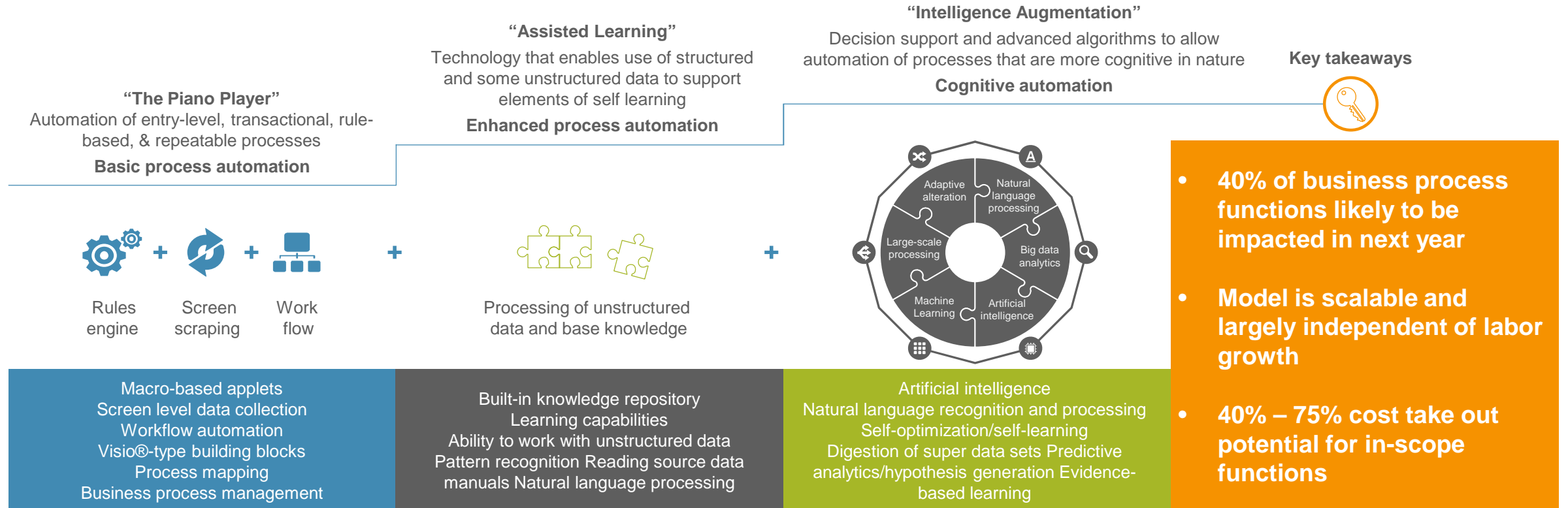
Class 3
Cognitive Automation

Decision support and advanced algorithms to allow automation of processes that are more cognitive in nature

Key Features	Macro-based	Unstructured Data	Natural Language Processing	Knowledge Base	Adaptive Alteration
		✓	✓	✓	✓
	Predictive Analytics	Machine Learning	Reasoning	Large-scale Processing	Big Data Analytics
	✓	✓	✓	✓	✓

Example: IBM Watson's natural language processing, machine learning, pattern recognition and probabilistic reasoning algorithms are aiding skilled employees with complex decisions

INTELLIGENT AUTOMATION SPECTRUM

A spectrum of technology that enables automation

"Intelligence Augmentation"
Decision support and advanced algorithms to allow automation of processes that are more cognitive in nature
Cognitive automation

"Assisted Learning"
Technology that enables use of structured and some unstructured data to support elements of self learning
Enhanced process automation

"The Piano Player"
Automation of entry-level, transactional, rule-based, & repeatable processes
Basic process automation

Key takeaways

Rules engine + Screen scraping + Work flow

+ Processing of unstructured data and base knowledge

+ Adaptive alteration / Natural language processing / Big data analytics / Artificial intelligence / Machine Learning / Large-scale processing

Macro-based applets	Built-in knowledge repository	Artificial intelligence	• **40% of business process functions likely to be impacted in next year**
Screen level data collection	Learning capabilities	Natural language recognition and processing	
Workflow automation	Ability to work with unstructured data	Self-optimization/self-learning	• **Model is scalable and largely independent of labor growth**
Visio®-type building blocks	Pattern recognition Reading source data	Digestion of super data sets Predictive analytics/hypothesis generation Evidence-based learning	
Process mapping	manuals Natural language processing		• **40% – 75% cost take out potential for in-scope functions**
Business process management			

2. INTELLIGENT AUTOMATION AND THE EVOLVING ROLE OF INTERNAL AUDIT

KEY OPPORTUNITIES FOR INTERNAL AUDIT

Governance Risk and Controls

Internal Audit can help to **integrate governance, risk, and controls considerations** throughout the automation program lifecycle as an organization establishes and implements its intelligent automation program.

Productivity / Performance

Internal Audit can help the organization **identify opportunities to embed automation-enabled control activities** within the impacted business processes.

Cost Efficiencies

Internal Audit can capitalize on intelligent automation labor innovations to increase the **efficiency and effectiveness of its own activities**.

THE INTERNAL AUDITOR'S ROLE IN SUPPORTING INTELLIGENT AUTOMATION ACROSS ALL THREE LINES OF DEFENSE
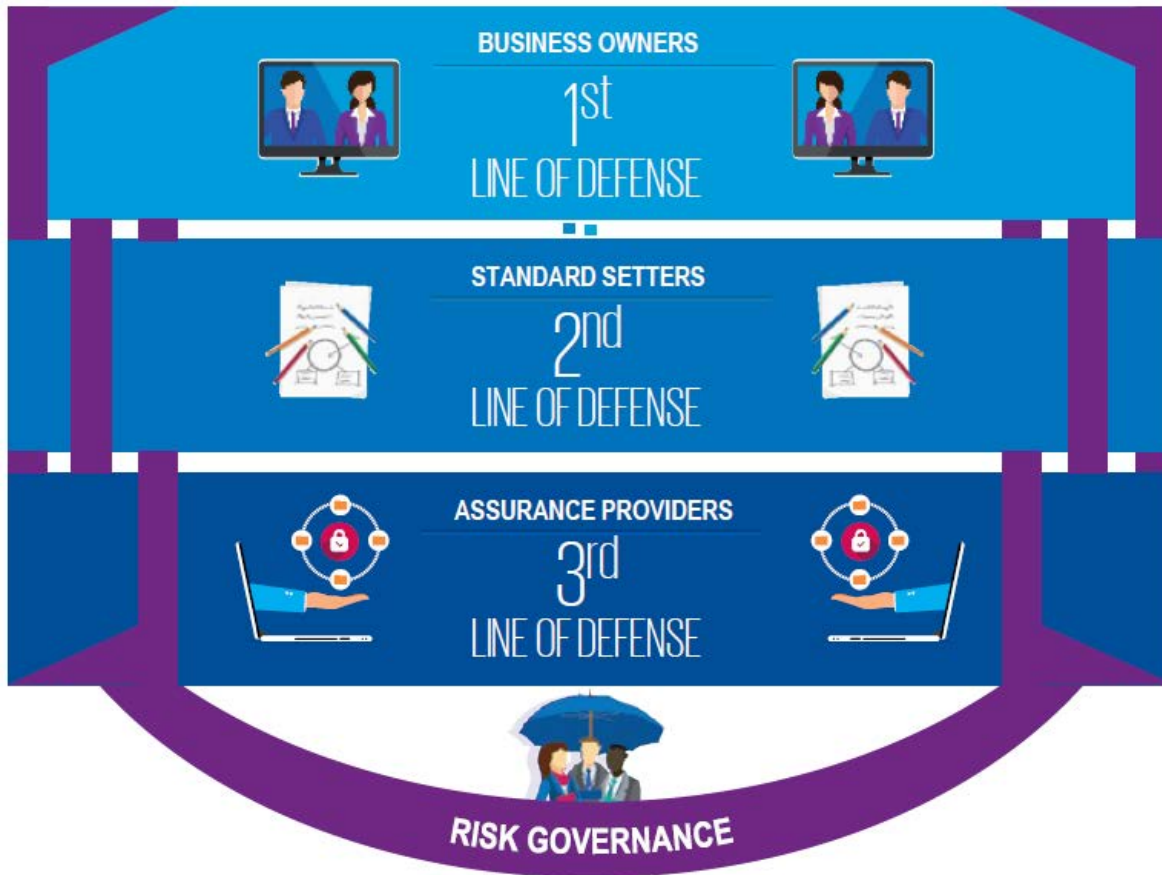
First Line of Defense – Consulting with Business owners:

- **Advise:** Act as a key "automation advisor" to the First Line
- **Assess Risk:** Help assess the impact that automation initiatives might have the organization's systems, controls and changing risk profile
- **Automate Control Activities:** Help identify opportunities to embed automation-enabled control activities into automation initiatives

Second Line of Defense – Consulting with Standard Setters:

- **Advise:** Act as a key "automation advisor" to the Second Line
- **Assess Risk:** Help identify risks associated with automation initiatives. Key areas for consideration include: (1) Authentication of bots, (2) Change management, (3) Program and bot monitoring ,and (4) Overall risk and governance.
- **Set Standards:** Advise on appropriate procedures and standards to address the governance, risk, and control considerations associated with an automation program.
- **Automate Control Activities:** Help identify opportunities to leverage automation within monitoring controls, regulatory compliance, regulatory policies, and reporting activities.

Third Line of Defense – As an Assurance Provider:

- **Advise:** Perform consultancy and/or assurance services to assess the governance, risk and control procedures and standards that are established and executed by the First Line and Second Line.
- **Automate the Third Line:** Seize automation opportunities to help Internal Audit reduce its costs, improve outcome quality, and drive additional value within the Internal Audit organization.

WHAT ARE YOU SEEING IN YOUR ORGANIZATION?

- Where and how is your organization considering or implementing intelligent automation?

  - First line activities?

  - Second line activities?

- Is your organization's third party outsource providers considering or implementing intelligent automation?

- Is there an opportunity to leverage an existing platform within the organization for Internal Audit's cost benefit?

INTELLIGENT AUTOMATION OPPORTUNITIES FOR THE 1ST AND 2ND LINES OF DEFENSE

Enterprise functions
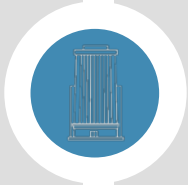
Human resources
- Employee on-boarding and off-boarding
- Payroll
- Time recording and compliance
- Repeatable tasks in ERP
- Email notifications
- Populating/aggregating employee information

Sales and marketing
- NLP enabled analytics
- Social media mining/ monitoring
- Predicting high value sales leads
- Manual CRM updates
- Virtual sales agents

Customer support
- Virtual agents (chat bots)
- Call center "agent assist"
- Task execution

Finance and accounting
- Month-End reporting
- Invoice processing/ exceptions
- AP/AR actions
- Close and reconcile sub-ledgers
- Asset depreciation and impairment
- Fixed asset reporting
- Financial forecasting
- Invoice validation and processing
- Tax filings

Legal/compliance
- Research/document review
- Document preparation
- Controls automation

Supply chain
- Order flow through
- Inventory Mgmt.
- Exceptions/fallout

Procurement
- Process Purchase Order
- Spend Analysis & Report.
- SLA Reporting
- Employee T&E Setup

WHAT ABOUT RISK?

- What risks do you see with your organization's intelligent automation initiatives?

  - What about your organization's third party outsource providers?

- How is Internal Audit helping management to assess these risks?
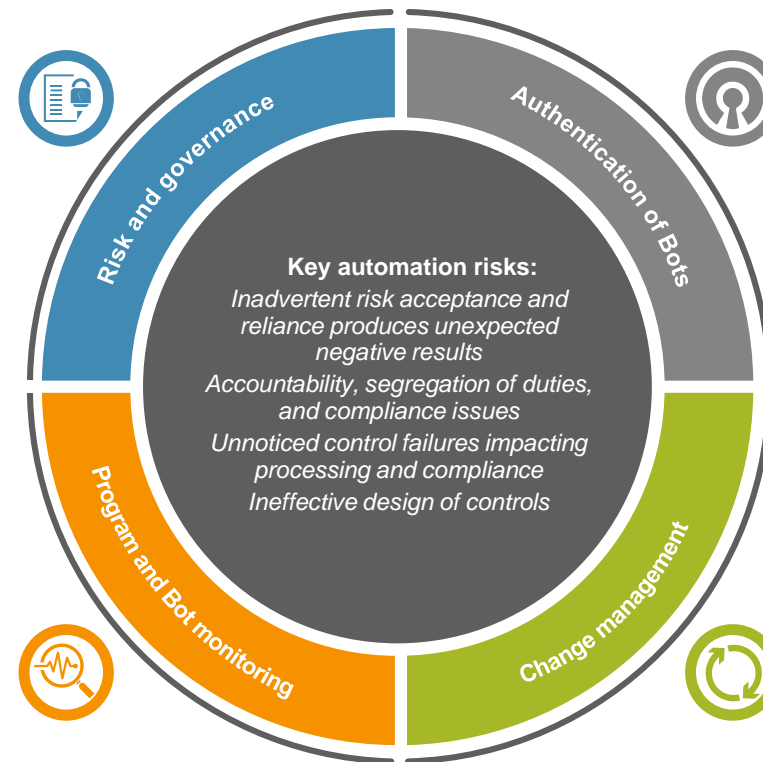
COMMON RISK PITFALLS OF INTELLIGENT AUTOMATION PROGRAMS

As organizations implement intelligent automation programs, there are common pitfalls related to the emerging governance, risk, and control considerations related to such programs.

Understanding these potential pitfalls—and why they matter to the success of the program and organization—can help the organization develop a plan to mitigate, or even prevent, such issues.

- Undefined ownership of intelligent automation program
- General lack of oversight of risk
- General lack of program oversight
- Lack of consistent and secure development and management of bots.

- Varying skill levels and inconsistent developer training
- Lack automated alerting tools for error handling and resolution
- General lack of controls around "is the bot doing what it is supposed to be doing"

Risk and governance

Authentication of Bots

Program and Bot monitoring

Change management

Key automation risks:
Inadvertent risk acceptance and reliance produces unexpected negative results
Accountability, segregation of duties, and compliance issues
Unnoticed control failures impacting processing and compliance
Ineffective design of controls

- Lack controls for proper ownership of Bot ID and effective integration of the Bot IDs with applications.
- Lack of bot accountability relating to security, privacy, and compliance requirements.
- Improper bot access provisioning and password management.

- Lack of formal process for assessing how source application changes affect Bots that access them.
- Lack formal and consistent process for requesting and implementing changes to Bots.
- Lack of segregation of RPA development and production.

3. GOVERNANCE AND RISK MANAGEMENT CONSIDERATIONS FOR THE INTELLIGENT AUTOMATION LIFECYCLE

GOVERNANCE AND RISK MANAGEMENT CONSIDERATIONS FOR THE INTELLIGENT AUTOMATION LIFECYCLE

1 — **PLAN**

2 — **BUILD**
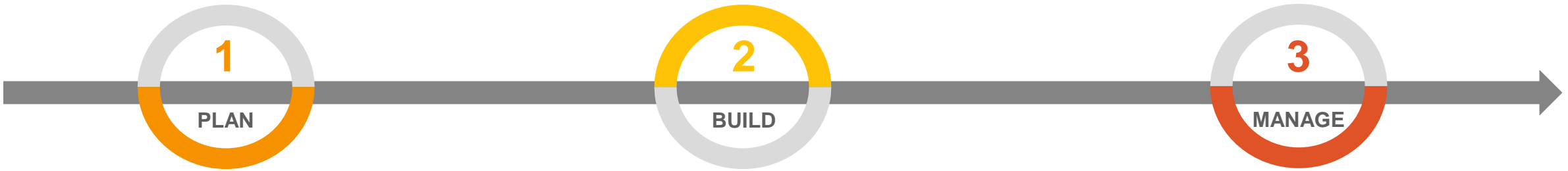
3 — **MANAGE**

RPA PROGRAM MANAGEMENT CONSIDERATIONS

Assess strategy and both business and operating model impacts	Identify, prioritize and build automation solutions	Drive continuous improvement, technology governance, and program management

Establish Program Management: Infrastructure Management, 3rd Party Management, RPA Support Functions, Strategy & Advisory, Benefits Realization, & Knowledge Management

RPA RISK MANAGEMENT CONSIDERATIONS

Understand risk profile and appetite including business and compliance requirements	Deploy training, templates, and toolkits enabling effective and timely identification, mitigation, and monitoring of risk	Continuously audit and manage risks

Establish Risk Management: Access and Change Management, Availability and Business Continuity, Secure Development, Auditing and Traceability, Data Integrity, Security, Privacy, and Compliance.

GOVERNANCE AND RISK MANAGEMENT CONSIDERATIONS FOR THE INTELLIGENT AUTOMATION LIFECYCLE

PLAN THE BOT – CONSIDERATIONS

- Ownership and accountability of bots
- Identification of impacted regulatory requirements and privacy considerations
- Risk and governance committees
- Organizational and people change management
- Program management

BUILD THE BOT – CONSIDERATIONS

- Understanding the nature of the data the bots access and their interaction with applications
- Helping ensure bots are developed to specified requirements and secure coding practices and tested
- Principles of "least privilege" for logical access/layered security model
- Secured authentication and encrypted communication channels
- Skills, capabilities, and training

MANAGE THE BOT – CONSIDERATIONS

- Business continuity and disaster recovery
- Monitoring and error handling
- Auditing, logging, and traceability
- Processing integrity
- Skills, capabilities, and training
- Vendor risk management

4. OPPORTUNITIES TO LEVERAGE INTELLIGENT AUTOMATION IN INTERNAL AUDIT

EXAMPLES OF SCOPING AREAS FOR INTERNAL AUDIT

Risk Assessment

Planning and scoping

Testing

Reporting

Remediation monitoring

Audit management/PMO

Engagement administration

AUTOMATING THE INTERNAL AUDIT METHODOLOGY

Example Areas for Automation Opportunity:

Strategic Analysis	■ Automated strategic analysis reports ■ Monitoring of strategic KPIs
Risk Assessment	■ Continuous Risk Assessment ■ Control Self-Assessment
Planning	■ SOX Scoping ■ Lead sheet generation ■ Process flowchart and narrative creation and updates ■ PBC management & reporting
Execution	■ A/R Aging ■ Records management audits ■ Borrowing reconciliations ■ Bank reconciliations ■ Data analytics-enabled applications ■ Loan reviews (Banking) ■ Account reconciliations ■ Sales and use tax processing ■ SOC1 report evaluation ■ Credit card account reconciliations (Banking) ■ Officer expense reviews ■ Multi-location audits ■ Nightly settlement reports (Banking) ■ Cash transfers ■ Automation monitoring ■ Financial and disclosure statement tie-out ■ IPE / spreadsheet testing ■ Contract compliance ■ Monthly consolidation and elimination entries ■ Lease to rent rolls & percent rent re-calculation (Real Estate) ■ Vendor audits ■ Franchise and management fee audits
Reporting and Continuous Improvement	■ Visual-based audit report and findings generator ■ Status reporting ■ GRC tool integration

BENEFITS OF INTEGRATING AUTOMATION WITHIN INTERNAL AUDIT PROCESSES

Reduced Cost – automation replaces high-touch, repetitive, manual activities

Increased Quality – automation, once configured, execute consistently and without error

Enable Continuous Risk Assessment, Auditing, and Monitoring – automation creates the potential for frequent or continuous risk assessment, auditing, and business-focused monitoring

Increased Capacity – automation allows more to be done across a broader range of audit activities with the same number of people

Increased Sample Rate – automation permits evaluation of larger numbers of transactions, even up to one-hundred percent sample size

Improved Reporting – automation allows for efficient analysis of large data sets, with conditional analysis, to create betters insights

5. OPPORTUNITIES TO LEVERAGE INTELLIGENT AUTOMATION IN INTERNAL CONTROL OVER FINANCIAL REPORTING (ICFR)
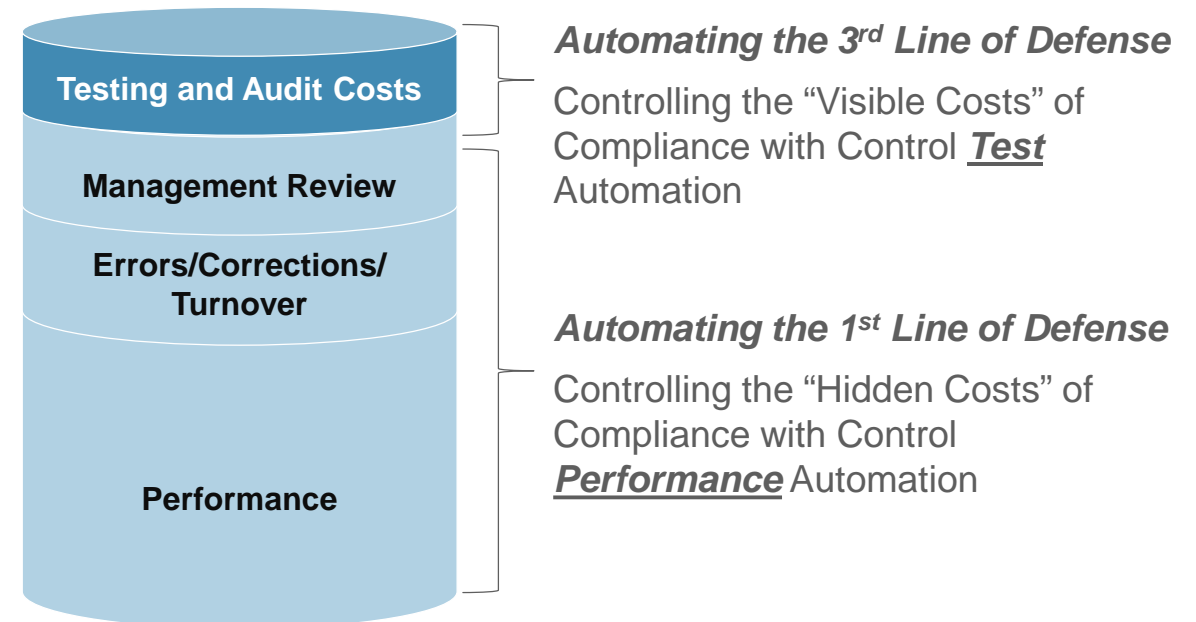
ICFR AUTOMATION IS ON THE HORIZON

Controls Survey[1] revealed that 83% of companies focused their 2016 Internal Controls over Financial Reporting (ICFR) strategy on minimizing costs related to documentation and testing of processes. However, the reality is that Auditing costs are only a small percentage of the total cost of controls.

Typically organizations don't consider "Hidden Costs" associated with control operation when calculating their cost of control. This represents an area with great potential for efficiencies by optimizing processes with automation.

Lack of focus on process improvement and "value add" continues to undermine the effectiveness of many programs in reducing risk, reducing cost, and driving value.

Cost of control components

Testing and Audit Costs

Management Review

Errors/Corrections/Turnover

Performance

Automating the 3rd Line of Defense
Controlling the "Visible Costs" of Compliance with Control **Test** Automation

Automating the 1st Line of Defense
Controlling the "Hidden Costs" of Compliance with Control **Performance** Automation

Sources
1- KPMG 2016 Controls Survey

EXAMPLE AREAS OF AUTOMATED SOLUTIONS FOR CONTROL TESTING

Business Process Testing - Automated Testing of Manual and Automated Controls

Manual	Automated	Other Control Testing
▪ Reconciliations	▪ Edit Checks	▪ Compliance testing
▪ A/R Aging	▪ Validations	▪ Cyber security testing
▪ Cash Transfers	▪ Calculations	▪ P&C Reserving
▪ Journal Entry Analysis	▪ Interfaces	▪ Payments – OFAC compliance
▪ Fee Audits	▪ Reports	▪ Payments reconciliations
▪ Loan Review		▪ Positive pay validation
▪ Nightly Settlement		
▪ Contract Compliance		

IT Controls Testing – Automated Testing of IT General Controls by Platform and/or ERP

Change Management	Logical Access	Computer Operations
▪ Changes are Authorized	▪ Passwords	▪ Incident Management
▪ Changes are Tested	▪ New Users	▪ Backups
▪ Changes are Approved	▪ Periodic Review	▪ Job Scheduling
▪ Dev Access to Production	▪ Terminations	▪ Physical Security
	▪ SOD	

INTELLIGENT AUTOMATION IMPACT TO SOX

Understanding intelligent automation in SOX

Increased focus on internal controls over financial reporting is intersecting with the increase of automation. Companies are continually looking for ways to automate formally manual, time intensive, arduous processes tasks or controls. As automation increases, companies need to think through:

1 Does my scoping of key financial systems include tools/transformation technologies ?

2 How are underlying, general IT controls changing to address new technology platforms ?

3 How is automation impacting business process controls and reports relied upon by management ?

4 If new automated controls are identified has the company identified the appropriate test procedures to address and understand the system complexity and logic?

6. GETTING STARTED WITH INTELLIGENT AUTOMATION

HOW SHOULD A LEADER BEGIN THE AUTOMATION JOURNEY?

Outlined below is a high level guide a leader can utilize to begin the automation journey.

→ **Identify and prioritize the potential use cases for automation**

→ **Develop a multifaceted strategy and roadmap for implementing automation in the organization**

→ **Select the right providers and partners to assist with the automation journey and roadmap**

→ **Establish a governance strategy (risk security and compliance) to help oversee the automation program and ensure benefits expected are realized**

→ **Establish a change management strategy to ensure effectiveness of adoption of automation throughout functions**

POSSIBLE FACTORS TO CONSIDER FOR USE CASE IDENTIFICATION

- Maturity level and complexity of existing Risk Assessment, Planning, Testing, Reporting and Project Management processes
  - Existing audit tools in use
- Types (structured, unstructured, semi-structured), quality (paper, electronic, digital) and access to data to be used by Internal Audit?
- Maturity and complexity of the control environment
  - Total number of controls
  - Entity level versus process level
  - IT versus Business Process controls
  - Number of manual, semi-automated, automated
  - Controls stability level
  - Languages used in documentation / evidence
- Complexity and stability of business processes
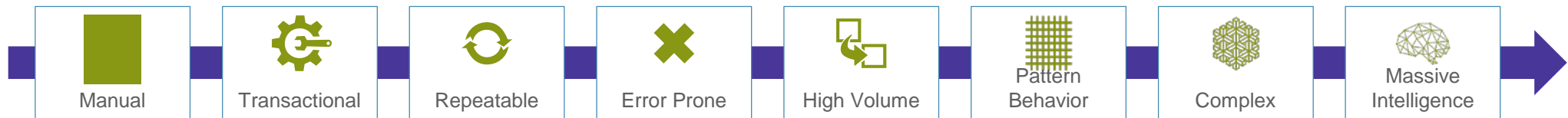- Number and complexity of IT systems

IDENTIFYING INTELLIGENT AUTOMATION USE CASES

Class 1
Basic process automation

Class 2
Enhanced process automation

Class 3
Cognitive automation

Types of Tasks

Manual	Transactional	Repeatable	Error Prone	High Volume	Pattern Behavior	Complex	Massive Intelligence

Complexity of task or job function?
Low ————————————————————— High

Level of **Judgment required?**
Limited/Explicit ————————————— Complex Decisions

How extensive is the **data**?
Minimal ————————————————— Extensive Knowledge Base

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QUESTIONS AND ANSWERS?

END OF PRESENTATION

THANK YOU FOR YOUR TIME AND ATTENTION!

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