Contents

• Intelligent Automation Overview
• Key Areas of Opportunity for Internal Audit
• Intelligent Automation Benefits for Internal Audit
• Sample Internal Audit Use Cases
• Considerations for Successful Execution of Intelligent Automation
Intelligent Automation
What is it?

- Business Process Automation?
- Robotic Process Automation?
- Natural Language Processing?
- Machine Learning?
- Artificial Intelligence?
- Cognitive?
- Digital Labor?
Digital labor is changing the way business is done

Digital labor as a label, refers to the broad continuum of technologies that augment human judgment and automate physical tasks.

In spite of enormous investments in business enabling technologies, significant manual effort remains in the workplace – so called “swivel chair” activities.

Additionally, knowledge workers in high-skill professions are being challenged to be able to fully access and take advantage of the vast, and expanding, amounts of information available to them.

Robotic Process Automation, Machine Learning and Cognitive technologies are increasingly taking over or complementing these roles.

Gartner, predicts that by 2025, one of every three US jobs will be in a category that has the potential for automation.
The intelligent automation marketplace is maturing rapidly

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

Cognitive technologies

60% Investment in cognitive technologies will be an area of focus for almost 60% of CEOs through 2020

Of CEOs are emphasizing trust, values and strong culture to sustain the organization’s future

81% 45%

Connecting with customers

45% say they are not effectively leveraging digital to connect with their customers

The concern for integration

61% are concerned about integrating cognitive processes and artificial intelligence in the workplace.

Active disruption to gain insight

72% said their organizations are actively disrupting their own sectors

Staying competitive means embracing digital

60% worry their organizations’ sensory capabilities and innovative processes will not stand up to rapid disruption

Source: 2017 CEO Outlook Survey, KPMG LLP (June 2017)
Transformation and innovation with 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 return: ~3x

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

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

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

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

**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.

**Auditability**
Software robots **keep the perfect audit trail** – a file built by the software that documents every action it took and the corresponding result.
The classes of intelligent 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**
- Processing of unstructured data and base knowledge
- 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 AI 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**
- Automation driven by self learning and adaptive technologies
- 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

**Key takeaways**

- **40% of business process** functions likely to be impacted in next year
- Model is scalable and largely **independent of labor growth**
- **40% – 75% cost take out potential** for in-scope functions
The classes of intelligent automation

Intelligent Automation Technology Spectrum

“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 transactional rules based tasks
Basic process automation

Rules engine + Screen scraping + Work flow + Processing of unstructured data and base knowledge +

Macro-based applets
Screen level data collection
Workflow automation
Visio®-type building blocks
Process mapping
Business process management

Built-in knowledge repository Learning capabilities
Ability to work with unstructured data
Pattern recognition Reading source data manuals Natural language processing

Artificial intelligence
Natural language recognition and processing
Self-optimization/self-learning
Digestion of super data sets Predictive analytics/hypothesis generation Evidence-based learning

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

Key takeaways

40% of business process functions likely to be impacted in next year
Model is scalable and largely independent of labor growth
40% – 75% cost take out potential for in-scope functions

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Three key areas 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 help capitalize on intelligent automation innovations to increase the efficiency and effectiveness of the internal audit department’s own activities.
Benefits of integrating automation within Internal Audit processes

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

**Increased Quality** – automations, once configured, execute consistently and without error

**Enable Continuous Risk Assessment, Auditing and Monitoring** – automation creates the potential for frequent, even 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 better insights
What are you seeing in your organization?

— Where and how is your organization considering or implementing digital labor?
  - First line activities?
  - Second line activities?

— Is your organization’s third party outsource providers considering or implementing digital labor?
Example areas of opportunity for automation in the 1st and 2nd Lines of Defense

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

**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

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

**Enterprise functions**
What about risk?

— What risks do you see with your organization’s digital labor initiatives?
  - What about your organization’s third party outsource providers?
— How is internal audit helping management assess these risks?
Emerging governance, risk and control considerations

What risks should you consider in your organization’s intelligent automation program?

Avoiding the common risk pitfalls – A few examples:

— Undefined ownership of DL program among business, IT, Center of Excellence, and/or Supplier

— General lack of oversight of risk mitigation and acceptance process

— General lack of program oversight including KRI and KPI reporting and risk acceptance.

— Lack of templates and enablers to help support consistent and secure development and management of bots.

— Varying skill levels and inconsistent developer training drives ineffective logging, monitoring, and analytics capabilities.

— Programs often lack automated alerting tools for error handling and resolution and lack trend analysis capabilities.

— General lack of controls around “is the bot doing what it is supposed to be doing” (completeness/accuracy/integrity of data).

— Programs lack controls for proper ownership of Bot ID and effective integration of the Bot IDs with applications.

— Programs often lack design and enforcement of Bot ID accountability relating to data elements the bot should have access to in light of security, privacy, and compliance requirements.

— Proper bot access provisioning and password management.

— There is often a lack of formal process for assessing how source application changes affect Bots that access them.

— Some RPA programs lack formal and consistent process for requesting and implementing changes to Bots.

— Segregation of RPA development and production environments is not consistently enforced.
ICFR automation is on the horizon

Controlling the cost of compliance
KPMG’s 2016 Controls Survey revealed that 83% of companies focused their 2016 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.

Cost of control components
- Testing and Audit Costs
- Management Review
- Errors/Corrections/Turnover
- Performance

Control cost drivers:
- Automation level
- Frequency of performance
- Duration of performance
- Level of staff performing the control
- Number of instances of control performance (number of locations and people that perform the control)
- Testing costs
### Example Areas of Automated Solutions for Control Testing


<table>
<thead>
<tr>
<th>Manual</th>
<th>Automated</th>
<th>Other Control Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reconciliations</td>
<td>Edit Checks</td>
<td>Compliance testing</td>
</tr>
<tr>
<td>A/R Aging</td>
<td>Validations</td>
<td>Cyber security testing</td>
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<tr>
<td>Cash Transfers</td>
<td>Calculations</td>
<td>P&amp;C Reserving</td>
</tr>
<tr>
<td>Journal Entry Analysis</td>
<td>Interfaces</td>
<td>Payments – OFAC compliance</td>
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<tr>
<td>Fee Audits</td>
<td>Reports</td>
<td>Payments reconciliations</td>
</tr>
<tr>
<td>Loan Review</td>
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<td>Positive pay validation</td>
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<tr>
<td>Nightly Settlement</td>
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<tr>
<td>Contract Compliance</td>
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</tbody>
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#### IT Controls Testing – Automated Testing of IT General Controls by Platform and/or ERP

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<thead>
<tr>
<th>Change Management</th>
<th>Logical Access</th>
<th>Computer Operations</th>
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</thead>
<tbody>
<tr>
<td>Changes are Authorized</td>
<td>Passwords</td>
<td>Incident Management</td>
</tr>
<tr>
<td>Changes are Tested</td>
<td>New Users</td>
<td>Backups</td>
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<tr>
<td>Changes are Approved</td>
<td>Periodic Review</td>
<td>Job Scheduling</td>
</tr>
<tr>
<td>Dev Access to Production</td>
<td>Terminations</td>
<td>Physical Security</td>
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<td>SOD</td>
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Example Areas of Scoping for Internal Audit

- Risk Assessment
- Planning and scoping
- Testing
- Reporting
- Remediation monitoring
- Audit management/PMO
- Department administration
# Automating the Internal Audit Methodology

## Example Areas for Automation Opportunity:

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

**Strategy and roadmap**
- Develop a strategy and align with enterprise initiatives including governance and risk management
- Develop a plan to manage change

**Identify Use Cases**
- Determine the “size of the prize”
- Assess technical and financial feasibility
- Consider all of the costs
- Compare the benefits to the cost?

**Implementation**
- Develop and deploy intelligent automation use cases

**Evaluation**
- Evaluate and improve as necessary

- Change Management
- Governance
- Risk Management – Security, Privacy, Vulnerability etc.
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
— Complexity and stability of business processes
— Number and complexity of IT systems
Identifying digital labor use cases

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

Class 1
Basic process automation

Class 2
Enhanced process automation

Class 3
Cognitive automation
Thank You!

To hear our latest thinking please visit
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