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Face the Future with Confidence

NEXT GENERATION INTERNAL AUDIT – PROCESS MINING

SEPTEMBER 13, 2019

TODAY'S PRESENTERS

Connect with our presenters on LinkedIn

Gregg Wishna is an Associate Director in Protiviti's Internal Audit and Financial Advisory group. Gregg has over 13 years consulting and audit experience with Protiviti; leading projects and working closely with Senior Management on Internal Audit and Data Analytics initiatives.

In addition to Internal Audit, Gregg has led several Data Management consulting projects, with a focus on Data Governance and Business Intelligence. In this capacity, Gregg has helped to develop strategy and new programs to enhance the overall use of organization data through new technologies and processes to produce impactful reporting and analytics capabilities for the business and internal audit.

gregg.wishna@protiviti.com

Justin Shirley is a Manager in the Atlanta Protiviti office. Justin has over 9 years of consulting and audit experience across various industries. His audit experiences include overall project management, annual risk assessment/internal audit planning, pre/post implementation reviews and performing application assessments.

In addition to his audit work at Protiviti, he currently assists within process mining informational sessions and aids clients in identifying process mining opportunities to leverage their data to make better audit and business decisions.

justin.shirley@protiviti.com

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TODAY'S TOPICS

Innovation

Next Generation Internal Audit

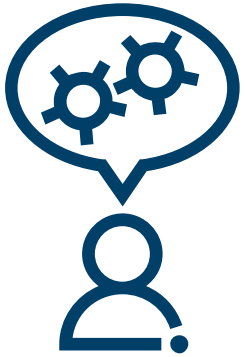
Process Mining

INNOVATION

WHAT IS INNOVATION?

Definition:

"The introduction of something new; a new idea, method or device." - Webster's Dictionary



Innovation it is creating novel solutions with measurable value for ourselves and existing or potential clients (internal or external); experimenting with new ways to solve problems and seize opportunities that result in unique and differentiated solution.

"Innovation distinguishes between a leader and a follower."

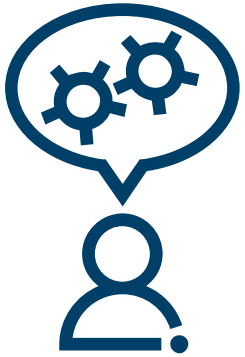
~ Steve Jobs

Why is it Important

To embrace tomorrow's changes, we need novel solutions to solve problems, reduce risk and improve efficiency.

WHAT IS INTELLIGENCE?

Definition:



"The ability to learn or understand or to deal with new or trying situations; the ability to apply knowledge to manipulate one's environment or to think abstractly as measured by objective criteria (such as tests)" – Webster's Dictionary

The ability to acquire and apply knowledge and skills

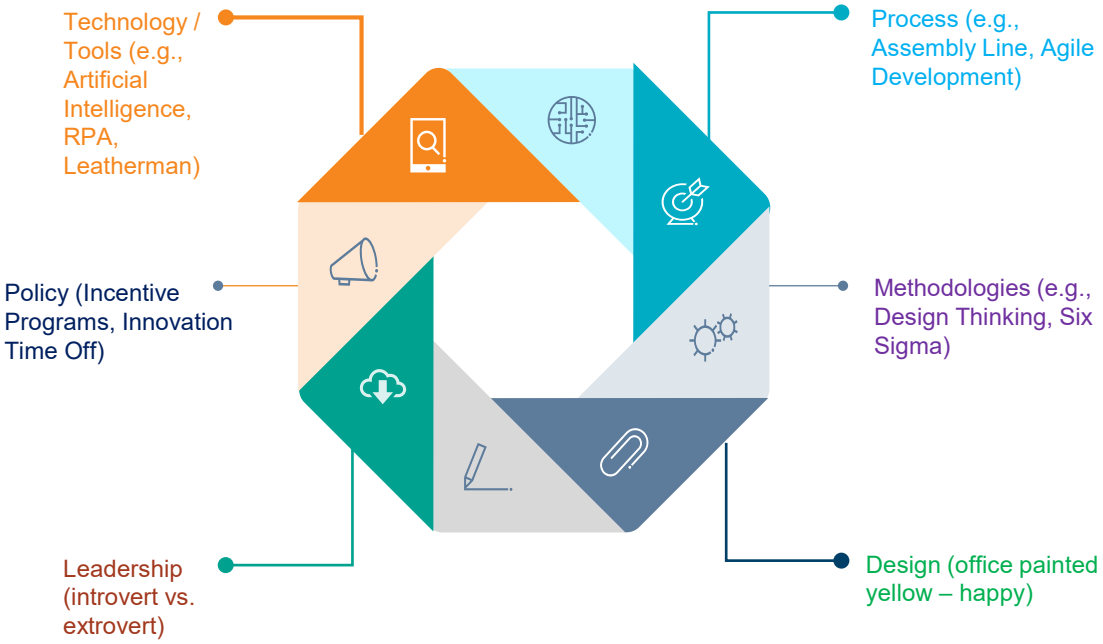
"Intelligence is the ability to adapt to change" ~ *Stephen Hawking*

Why is it Important

To embrace tomorrow's changes, we need novel solutions to solve problems, reduce risk and improve efficiency.

INNOVATION TODAY

We all have an opportunity to be innovative – we can do this through technology, processes, methodologies, design, leadership, policy, etc.



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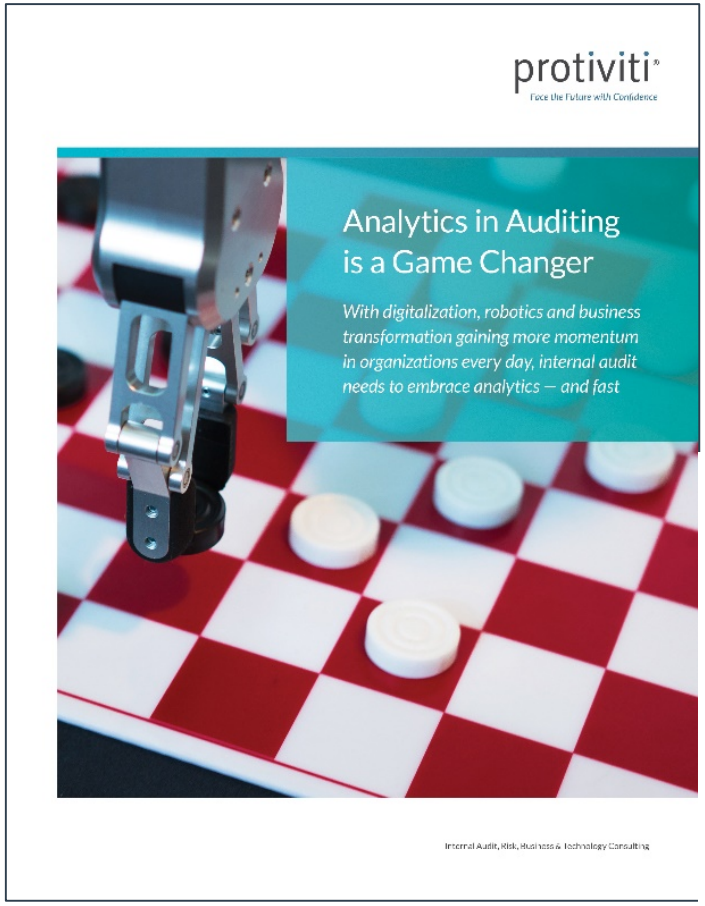
NEXT GEN INTERNAL AUDIT

INTERNAL AUDIT NEEDS TO EMBRACE ANALYTICS…FAST

2018 Internal Audit Capabilities and Needs Survey



- Data analytics will be a game changer for the internal audit profession.
- Not surprisingly, the ability to utilize data analytics and "big data" to achieve competitive advantage and manage operations and strategic plans ranks among the top risk issues for board members and C-suite executives worldwide.
- Key Findings:

01 The overall maturity levels of analytics activities within internal audit groups remain relatively low.

02 Based on the survey results, many audit functions are likely using analytics tools as point solutions as opposed to part of a broader initiative to leverage analytics throughout the audit process.

03 Internal audit functions in Europe and the Asia-Pacific region appear to be more mature in their use of data analytics than internal audit groups in North America.

04 There is a correlation between the level of audit committee interest in the use of analytics and the amount/level of information shared with the committee about the use of analytics to support the lifecycle of audit activities.

IMPERATIVES FOR INTERNAL AUDIT

The following imperatives are based on feedback from members of audit committees regarding expectations of the chief audit executive (CAE) and the internal audit function.

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ARE YOU THE RISK ORACLE FOR THE ORGANIZATION?

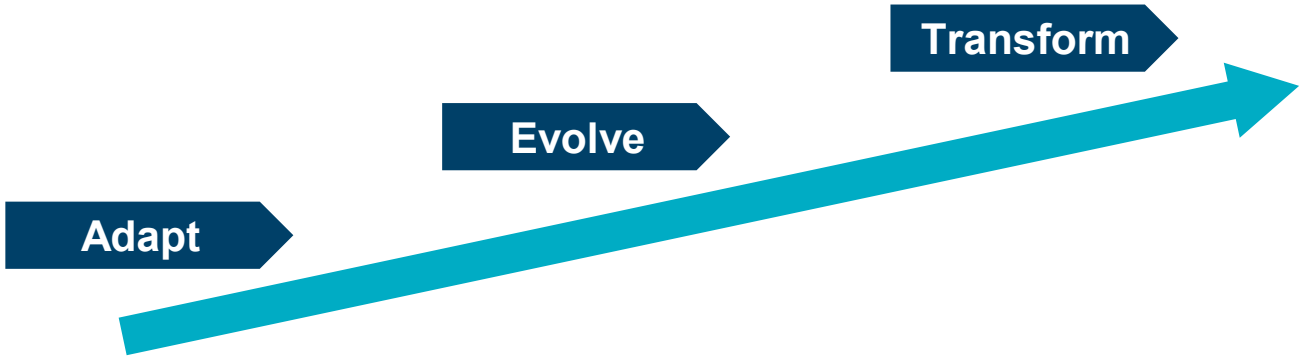
1. Internal audit's role in identifying and analyzing risk has become a corporate imperative, even at companies with a separate risk management infrastructure, such as a chief risk officer or chief privacy officer.

2. Internal audit, especially CAEs, are often perceived as a reservoir of knowledge and insight to be tapped and deployed to improve risk culture and risk management capabilities to inform senior management and the board of upcoming risks.

3. The difference between other "chiefs" in the organization and the CAE is that, in most organizations, he/she not only reports to the board, but also has frequent face time with directors.

4. This underscores how critical it is for the internal audit function to demonstrate an understanding of strategic risk and be an engaged, familiar face around the company, particularly with its leaders.

THE WAY FORWARD FOR INTERNAL AUDITORS

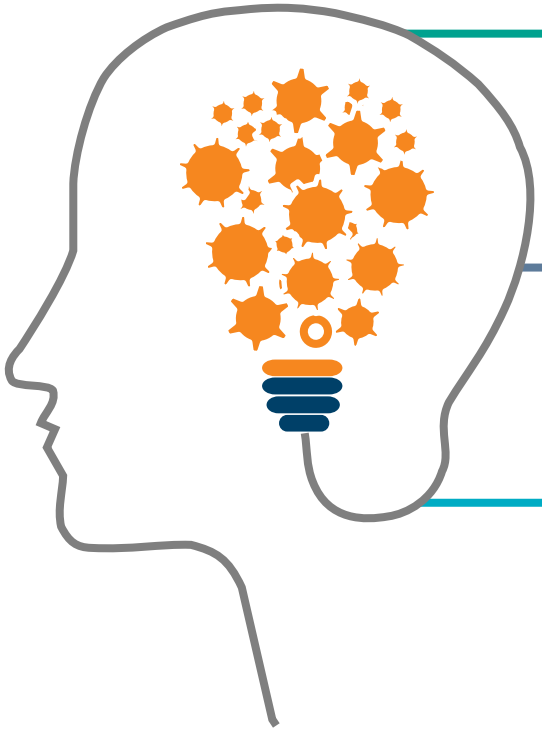


Key Questions to Consider:

- Are you positioned to respond to changing key business risks associated with digital transformation initiatives?
- Are you able to leverage enterprise data efficiently to conduct risk assessments and continuous monitoring?
- Have you added resources and skill sets to address increased expectations from internal and external stakeholders?
- Have you started to use technology to enhance the internal audit function along with relying on existing methodologies?
- Are you still relying primarily on point-in-time risk assessments?
- Are you still performing audits and reviews in the same way as in years past?

THREE ESSENTIAL OBJECTIVES FOR THE NEXT-GENERATION INTERNAL AUDIT MODEL

The objectives of next-generation internal audit functions may be straightforward, but the means by which they achieve these objectives include a range of innovative approaches, tools and governance enablers, including a culture of innovation, that must be tailored to specific organizations and their needs.



Improve assurance by increasing the focus on key risks

1

Make internal audit more efficient

2

Provide deeper and more valuable insights from internal audit's activities and processes

3

ANALYSIS PERFORMED BY DATA ANALYTICS FUNCTION

Where are we seeing this integrated?

Source: Protiviti 2018 survey

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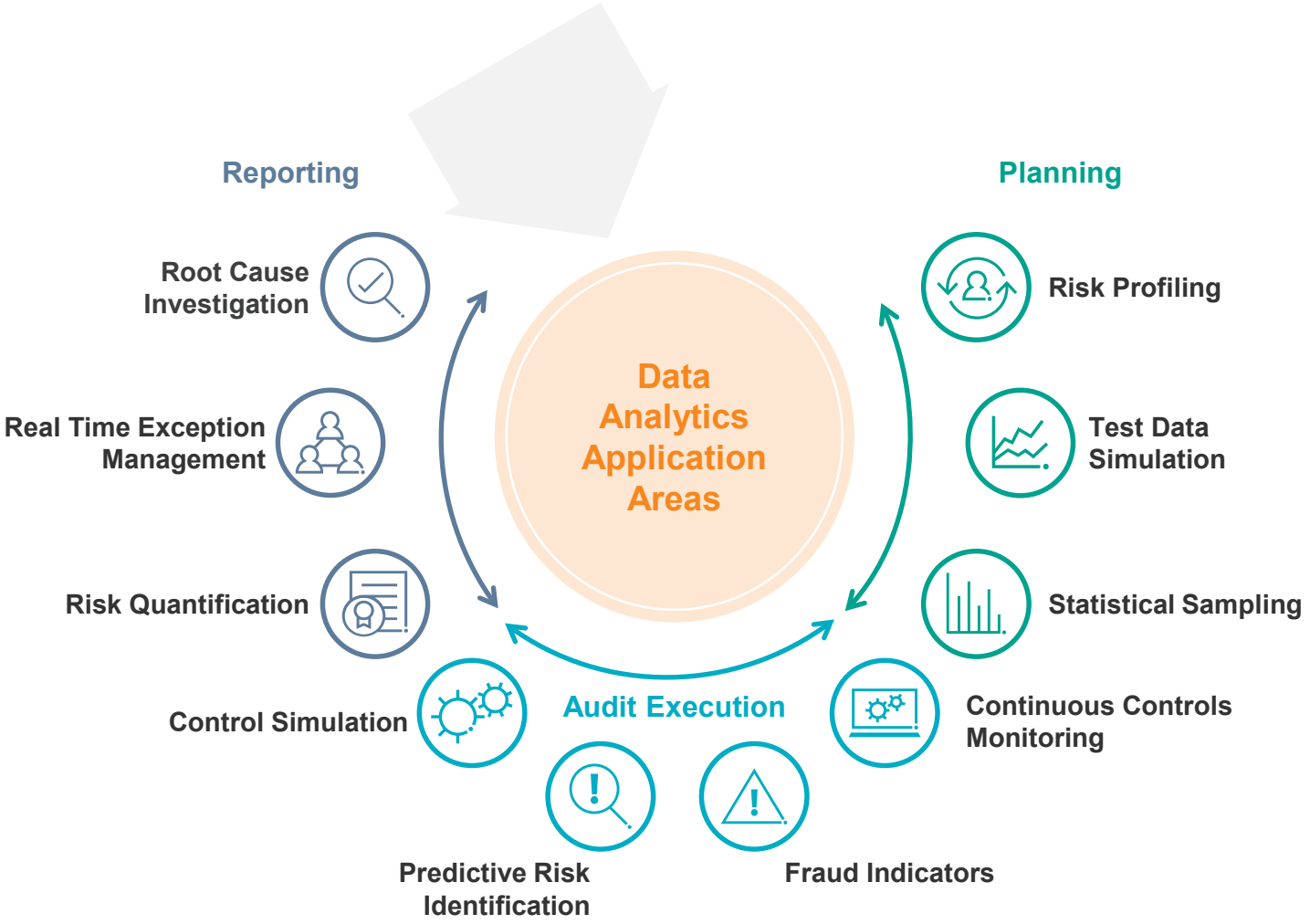
WHY USE DATA ANALYTICS?

1	Transform a flood of data into meaningful information
2	Facilitate risk identification, measurement and profiling – answer important business questions
3	Increase testing quality and insight: • **Test 100% of populations** instead of sampling • **Provide true error rates** rather than error estimates • **Highlight trends** and factors that may not be noticed through conventional audit techniques • **Identify** interesting subsets of the population for testing and **new unseen relationships**
4	Increase productivity and efficiency
5	Deliver value-added suggestions and/or provide ongoing analytics tools to management

THE ANALYTICS ADVANTAGE IN INTERNAL AUDIT



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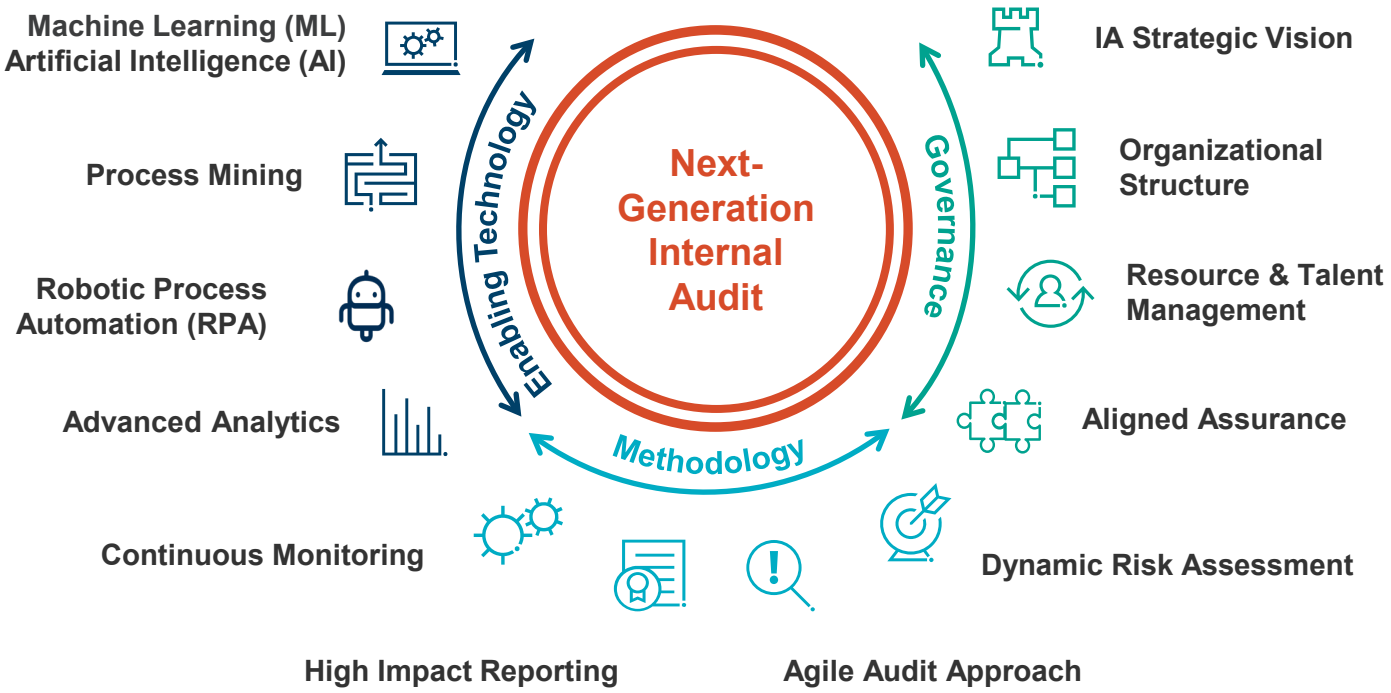
OUR VISION FOR NEXT-GENERATION INTERNAL AUDITING

The specific governance structures, methodologies and enabling technologies that next-generation internal audit groups introduce vary. However, nearly all of the transformations Protiviti has supported have addressed most, if not all, of the following competencies, qualities and components in three broad categories:



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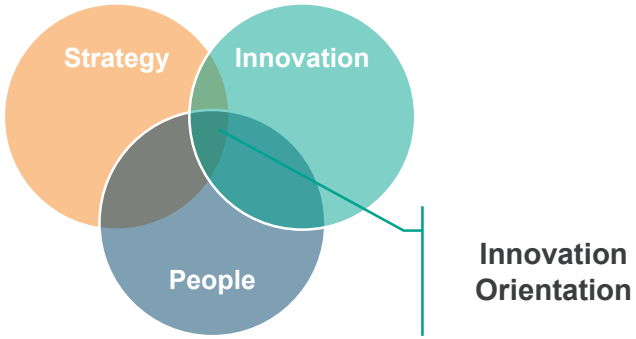
NEXT-GENERATION – GOVERNANCE

Achieving Synergy Between Strategy and Innovation

- Define an innovation orientation
- Thoughtful alignment of strategy and innovation/transformation
- Establish an innovation mindset, capability and culture
- Empower and align resources to deliver

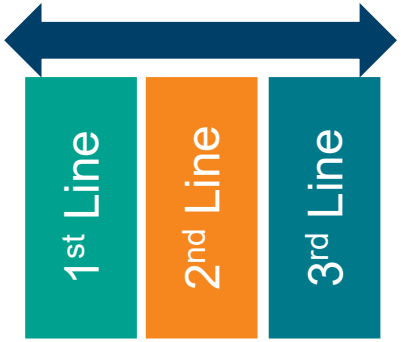


Requires New (and Evolving) Skills and Capabilities

- Auditor skillsets are already evolving and the auditor of the "function of the future" will need to evolve further
- Capabilities once considered "technical" will soon become core
- New approaches to talent and resource management will be required

Aligned Assurance and Agile Risk Management

- Effective risk management comes from the collective view of multiple risk, control, compliance, assurance functions – each providing a unique perspective
- Maximum value depends upon alignment, consistency, and coordination (coverage, terminology, ratings, taxonomy etc.)



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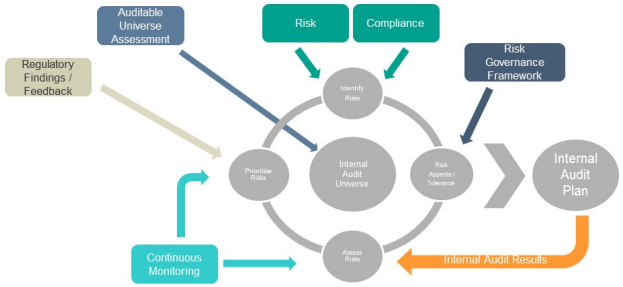
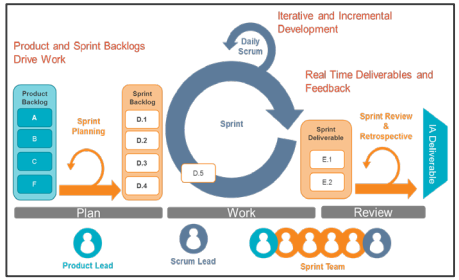
NEXT-GENERATION – METHODOLOGY

Dynamic Risk Assessment and Continuous Monitoring

- Dynamic risk assessment provides a closer to real-time risk view, often making use of internal and external data sources
- Integrated with a mature continuous monitoring program to allow the internal audit function to respond to changes in the business in near real-time





Agile Methodology

- Agile in internal audit is the application of modern SDLC approaches to drive efficiency and effectiveness driving internal audit to follow-the-risk and reduce time-to-value
- Innovative internal audit functions are adopting (and adapting) concepts of agile to drive additional value while exploring new delivery models

High Impact Reporting

- In today's fast moving environment, timely communication of quality, actionable information is key
- Long, narrative based reporting formats need to be re-examined
- Innovative internal audit functions are delivering reports in more interactive, graphic-rich formats to deliver maximum impact

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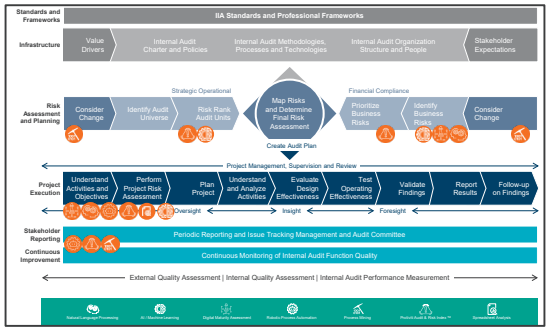
NEXT-GENERATION – DATA AND TECHNOLOGY

Data and Technology Enablement

- Data and technology embedded throughout the internal audit lifecycle and a core competency
- In today's data rich environments, data should inform everything that is done and be core to reporting
- Explore existing and emerging technologies (RPA, AI/ML, process mining, etc.)



Embrace Emerging Technologies

- Extensive reliance on automation, data analysis and a variety of advanced technology applications is a defining feature of next-generation internal audit functions
- New technologies should not just be "dropped into" the old ways of doing things

RPA, Machine Learning/AI, Process Mining…

- Automate highly manual tasks within the internal audit function
- Leverage data to understand processes at a deeper level and "automate" walkthroughs
- Explore AI and algorithmic methods to increase the effectiveness and efficiency of complex testing and pattern recognition

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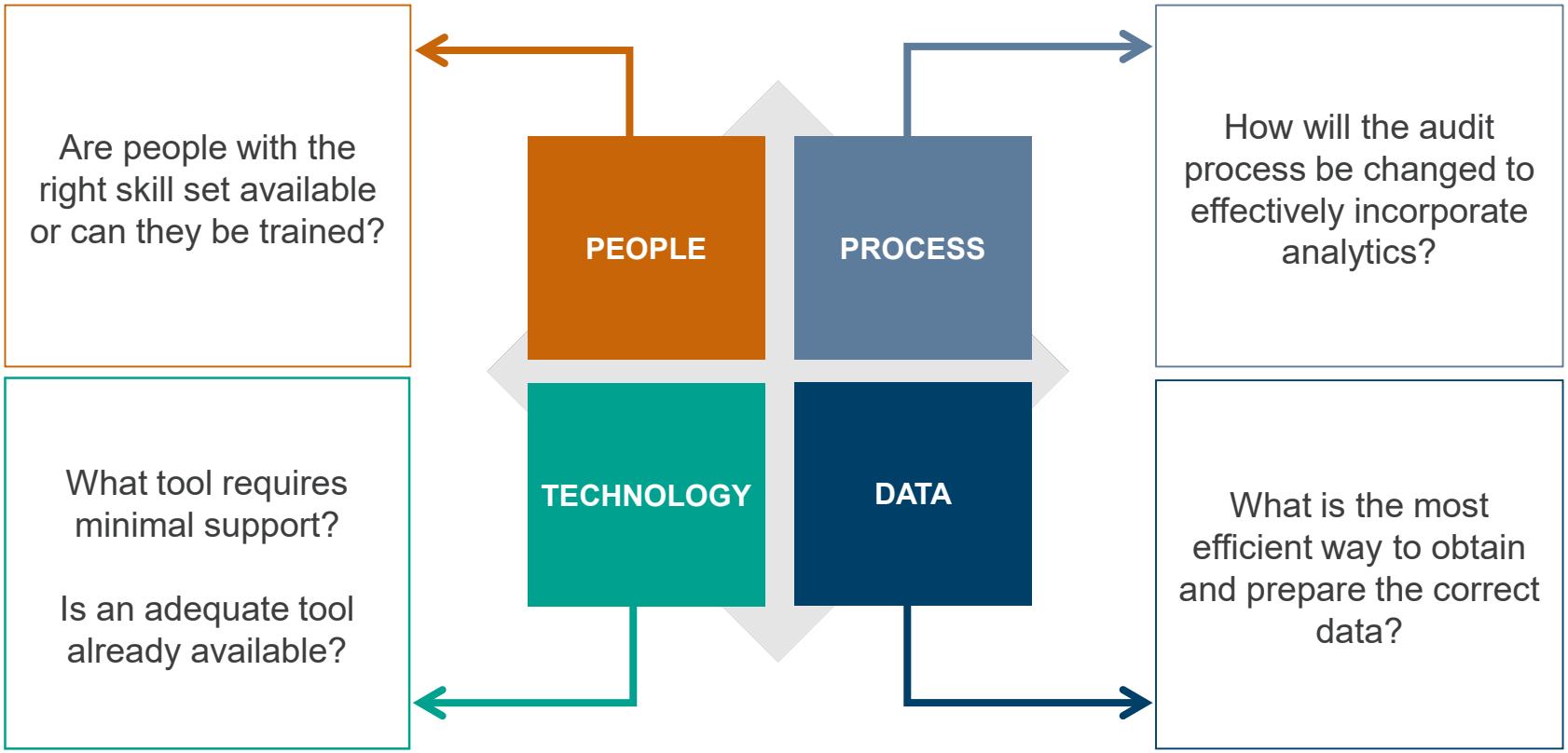
SUCCESSFUL DATA ANALYTICS

For success, factor in process changes, have the right resources, and obtain the right data

Building Blocks of Data Analysis



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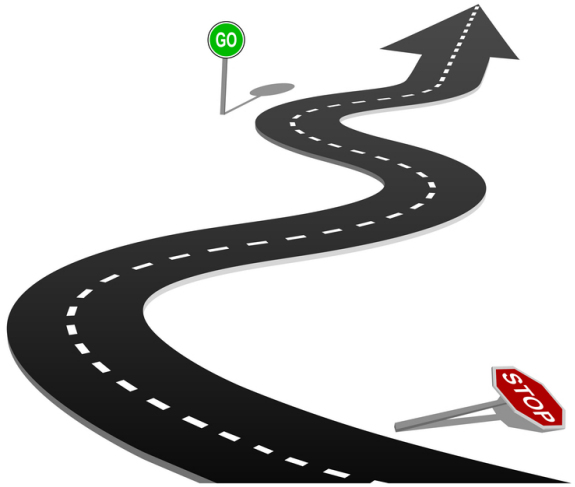
STARTING THE JOURNEY

To get started on the journey to become a next-generation internal audit function, you will need a clear roadmap. The very first step, in our view, is establishing the mindset and commitment to:

- Transform your internal audit group's governance, methodologies and enabling technology capabilities needed to address emerging business risks.
- Increase internal audit's effectiveness and efficiency while fulfilling the function's core mission to protect organizational value.
- Start thinking differently.
- Reassess the design and capabilities of internal audit, striving to become an agile next-generation internal audit function that embraces the benefits of technology and transformation.



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WHAT IS DESIGN THINKING?

Design thinking is a **human-centered** approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success.

- Tim Brown,
President and CEO. IDEO

Most people make the mistake of thinking design is what it looks like. People think it's this veneer — that the designers are handed this box and told, 'Make it look good!' That's not what we think design is. It's not just what it looks like and feels like.. **Design is how it works**

- Steve Jobs,
Co-founder, Chairman, and CEO of Apple

Design thinking refers to design-specific cognitive activities that designers apply during the process of designing.

- Wikipedia

Design Thinking is a process that is **iterative** and expansive, which resists the temptation to jump immediately to a solution for the stated problem. Designers should first spend time determining what basic, fundamental (root) issue needs to be addressed. Then, once the real problem is identified, the designer considers a wide range of potential solutions before converging to the right solution.

- Don Norman, Professor,
Co-Founder of the Nielsen Norman Group and Author

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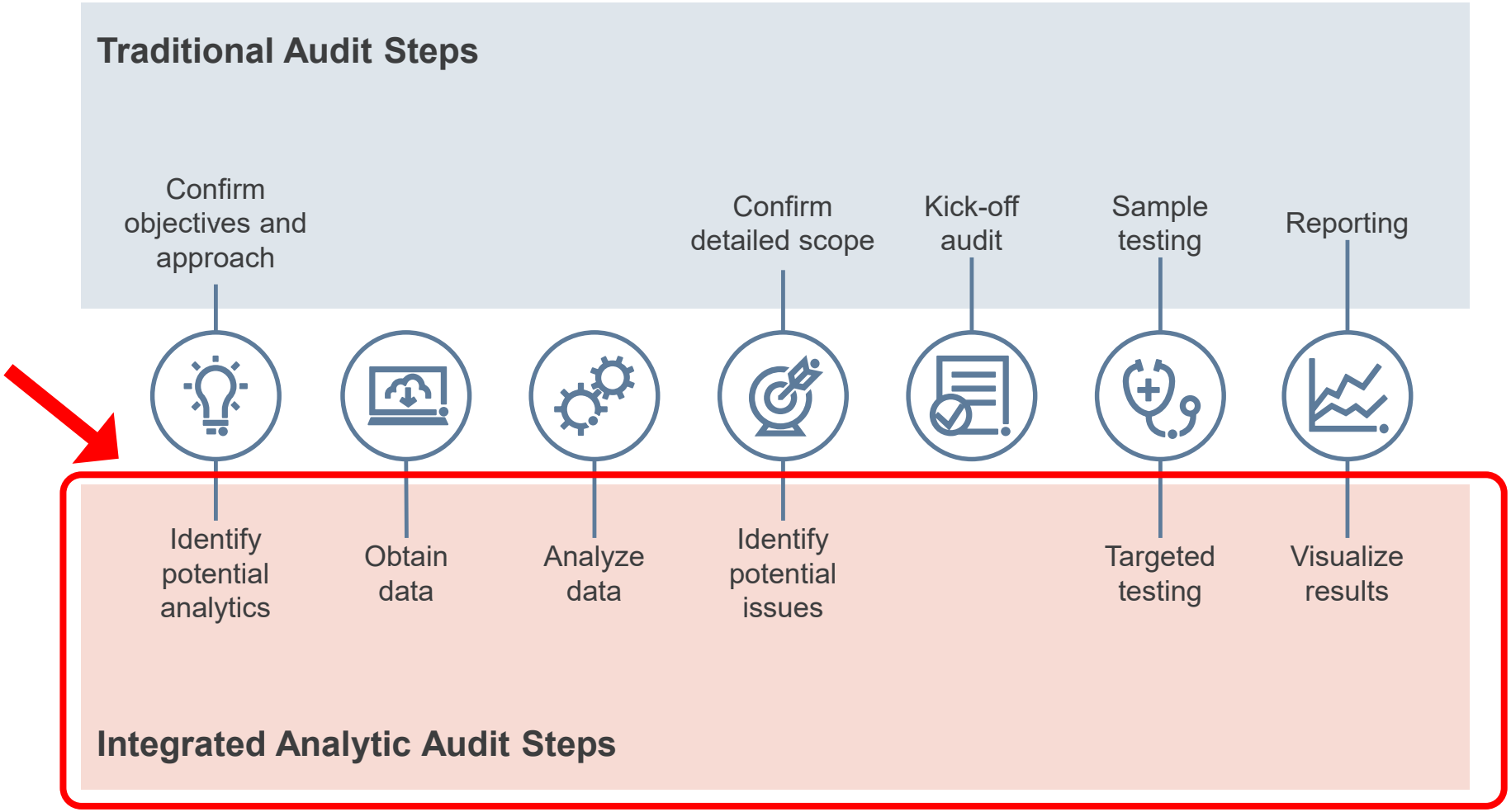
INTEGRATING ANALYTICS INTO THE AUDIT PROCESS

The entire audit process from scoping to reporting is affected by integrating analytics



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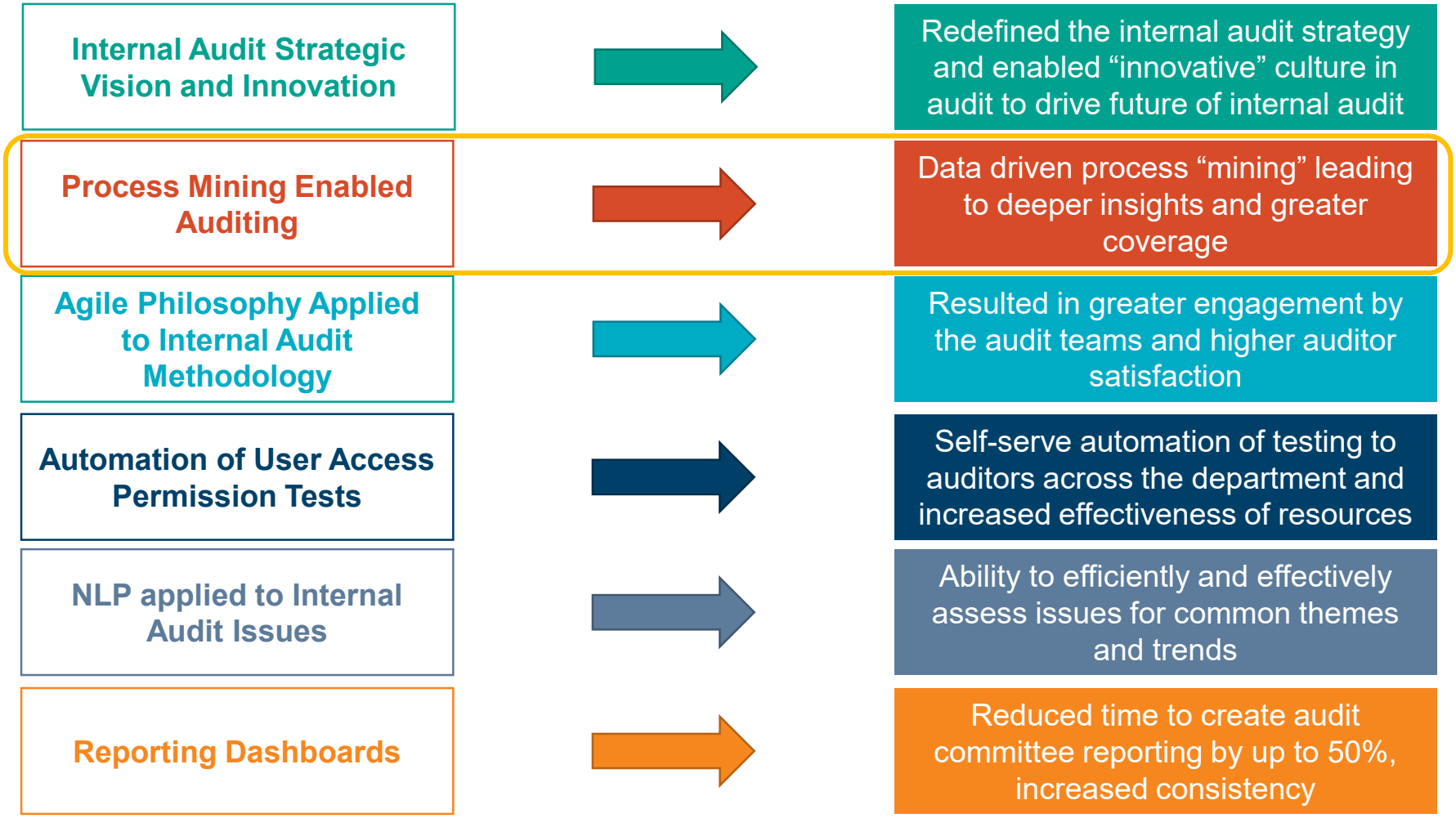
EXAMPLES OF NEXT GEN



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WHAT IS PROCESS MINING?

PROCESS MINING

Where did this come from anyway?

2008!

Gartner

Automated Business Process Discovery Improves BPM Outcomes

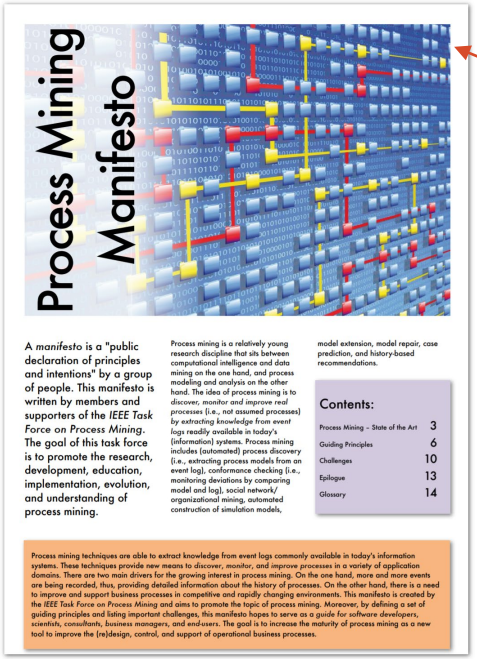
ARCHIVED Published: 23 December 2008 ID: G00164422

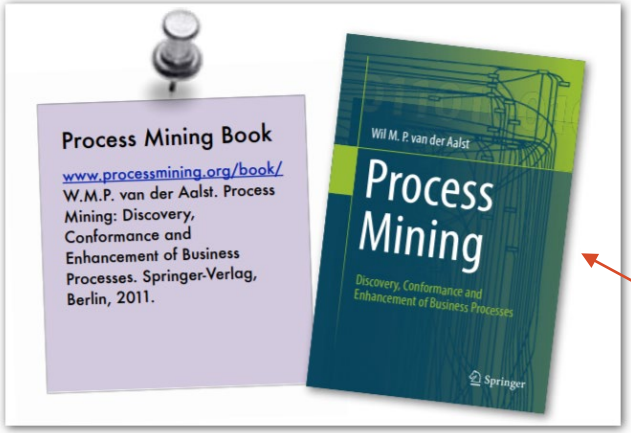
Analyst(s): Marc Kerremans

Institute of Electrical and Electronic Engineers (IEEE) Task Force on Process Mining in 2009

To promote the research, development, education and understanding of process mining

2009





2011

WHAT IS PROCESS MINING?

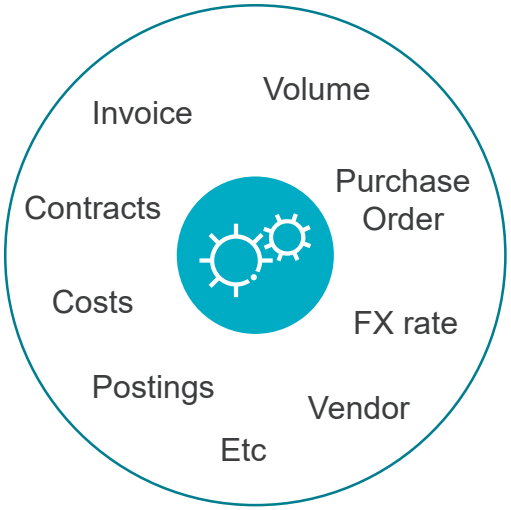
Process Mining uses AI and machine learning to extract existing data from an organization's IT systems to visually reconstruct how processes actually perform. The data shows what is **actually** happening and creates a **complete** process map.

- Process mining takes individual process steps (think of these as "**digital footprints**" stored by operational systems), pulls them together and organizes them visually to show each step of the journey to complete the process.
- In this way, process mining identifies areas of inefficiency, non-compliance, or candidates for process improvement, often **in places we might not even think to look**.
- Process mining then allows us to focus efforts in the right areas (**efficiency**) and provides data-driven substance behind recommendations to drive a better business outcome (**effectiveness**).

HOW DOES PROCESS MINING WORK?

Think of process mining as an x-ray machine for your processes, using the data captured by systems to show you what is actually happening, how transactions are actually being processed.

Business Activity



Transactional Activity
Captured in enterprise systems (SAP, Oracle, Microsoft AX etc.)

Key Data Elements

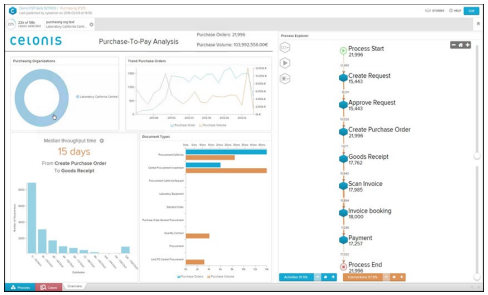
Activity

Case ID

Time Stamp

Digital Footprints
Process Mining constructs process views using data

Process Map



Full Transparency
Actual activity are visualized in interactive process flows

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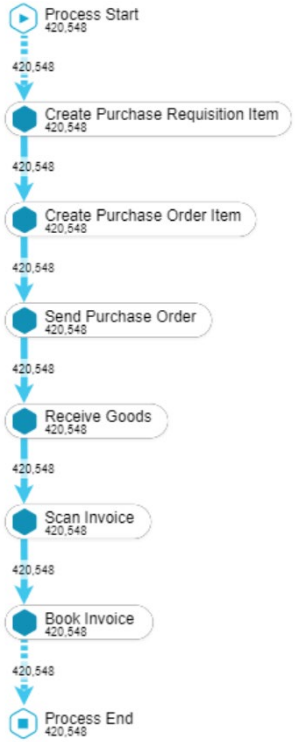
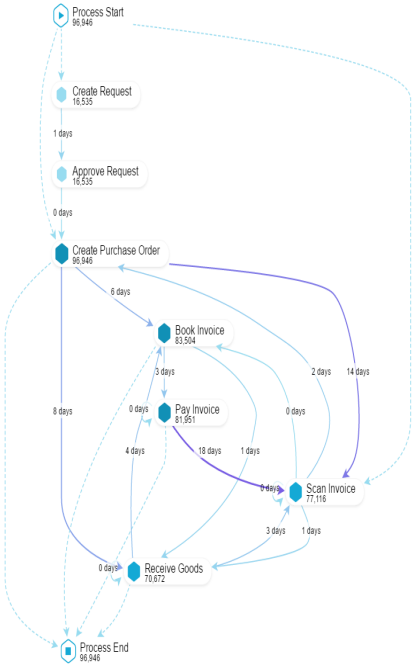
THE REAL PROCESS…

See the happy paths



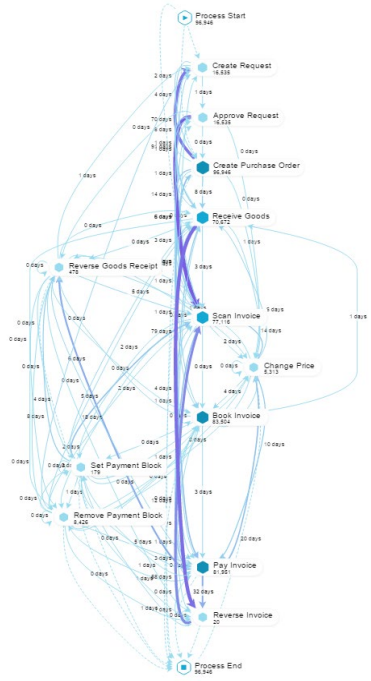
See the core process flow.

Explore deviations



Reveal less common paths and activities. ID non-compliance, and inefficiency

Get the full picture



Data coverage of 100%. Full process transparency.

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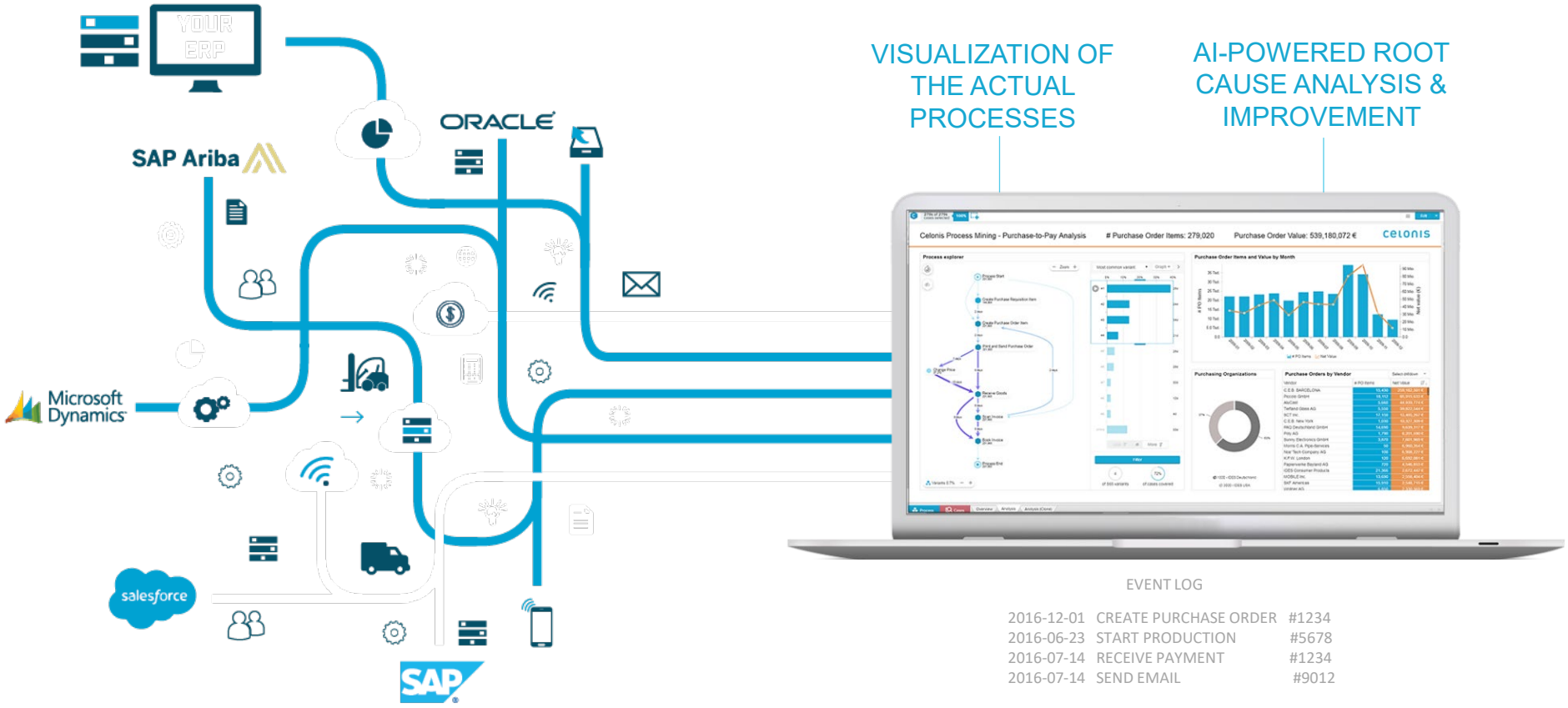
PROCESS MINING BY CELONIS



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INTUITIVE DASHBOARDS

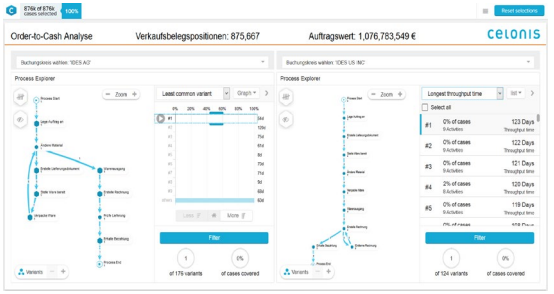
Modern dashboards allow their end-users in the decision making process and review performance in near real-time

Process map animation

You can create breathtaking animations, visualizing your process as it happened, right on your process map. Animation can help you to instantly spot bottlenecks where work is piling up.

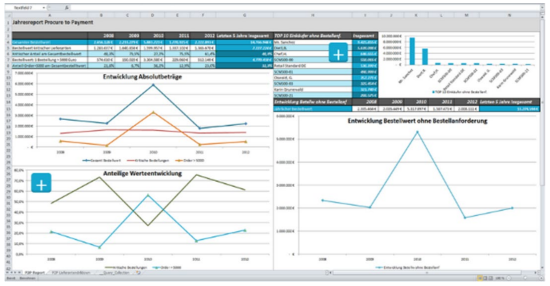
Benchmarking and Details

Get an overview about your data from sleek, interactive charts, and drill down into detailed information about each activity, resource, and attribute value. The (benchmark) statistics view can answer a lot of questions.



Import and Export

Sorting your data is magnitudes faster than with any other solution. Data set export in CSV format for multiple cases, custom chart and report generation with MS Excel. CSV export of statistics tables for further analysis with statistics tools or for reporting purposes.



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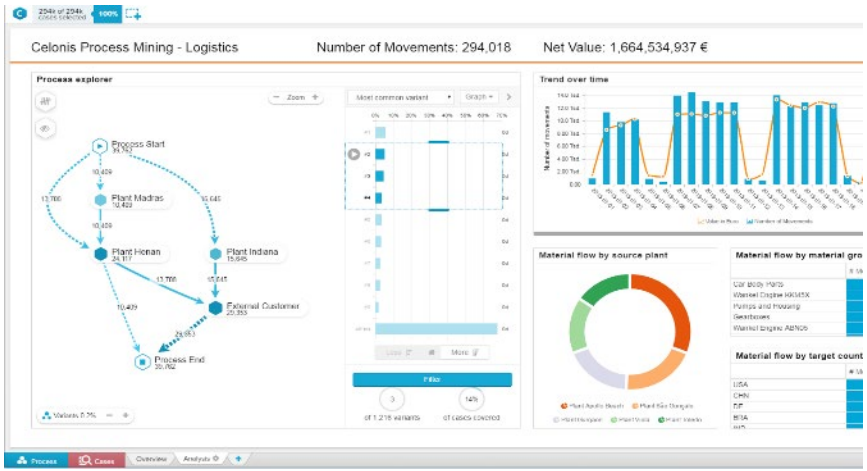
WHY PROCESS MINING FOR INTERNAL AUDIT?

Process mining tools can fundamentally change the way that we analyze processes and perform audits.



- **Automate the walkthrough process** – replace interviews with advanced analytics and review process based on 100% populations.
- **Data tells us what is *actually happening*** – automatically identify process variants and complexities, identifying areas that do not comply with intended process design.
- **Support risk assessment** activities – identify “hot spot” areas, drive audit focus
- **Make findings more impactful** by quantifying the impact of non-conformance and benefits of adherence to consistent process.

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CLIENT CREDENTIAL – LARGE ENERGY UTILITY

Background & Objectives

- The internal audit department of a large energy utility providing electrical power and natural gas to over 1.8 million customers in the US was performing an audit the organization's Accounts Payable (AP) process and wanted to incorporate analytical procedures to provide data-driven results. Protiviti was engaged to use Celonis process mining to analyze SAP data to support the audit.
- The objectives of the analysis were to identify process deviations, inefficiencies, and areas of risk as well as to benchmark the organization's AP processes against both the utility industry as well a cross-industry sample of similarly sized organizations.

Solution

- Collaborated with key stakeholders to define the data scope, understand known pain points in the process and determine evaluation criteria.
- Performed data provisioning activities to transfer data into the Celonis process mining environment.
- Analyzed SAP data for an 18-month period that included over 144,000 invoices totaling approximately $5B.
- Benchmarked AP data against both the utility industry and similarly sized organizations across industries
- Demonstrated results via Celonis dashboard to management and delivered report highlighting key findings.

Deliverables

- Identified over 330 variations of the AP process based on actual invoice transactions
- Determined key themes of the analysis and developed observations related to patterns within the organization's achievement of cash discounts, payment behavior and cycle time
- Provided benchmarks highlighting areas of strength and opportunities for improvement when compared to the utility industry and peers across industries

Benefits to Client

- Quantified the total amount saved through the use of cash discounts and made recommendations to increase savings going forward
- Enhanced visibility into process deviations to better enable process standardization and efficiency
- Identified population of late payments and made recommendations to address root causes

INTERNAL AUDIT REPORT – SAMPLE EXCERPTS

SCOPE OF THE ANALYSIS

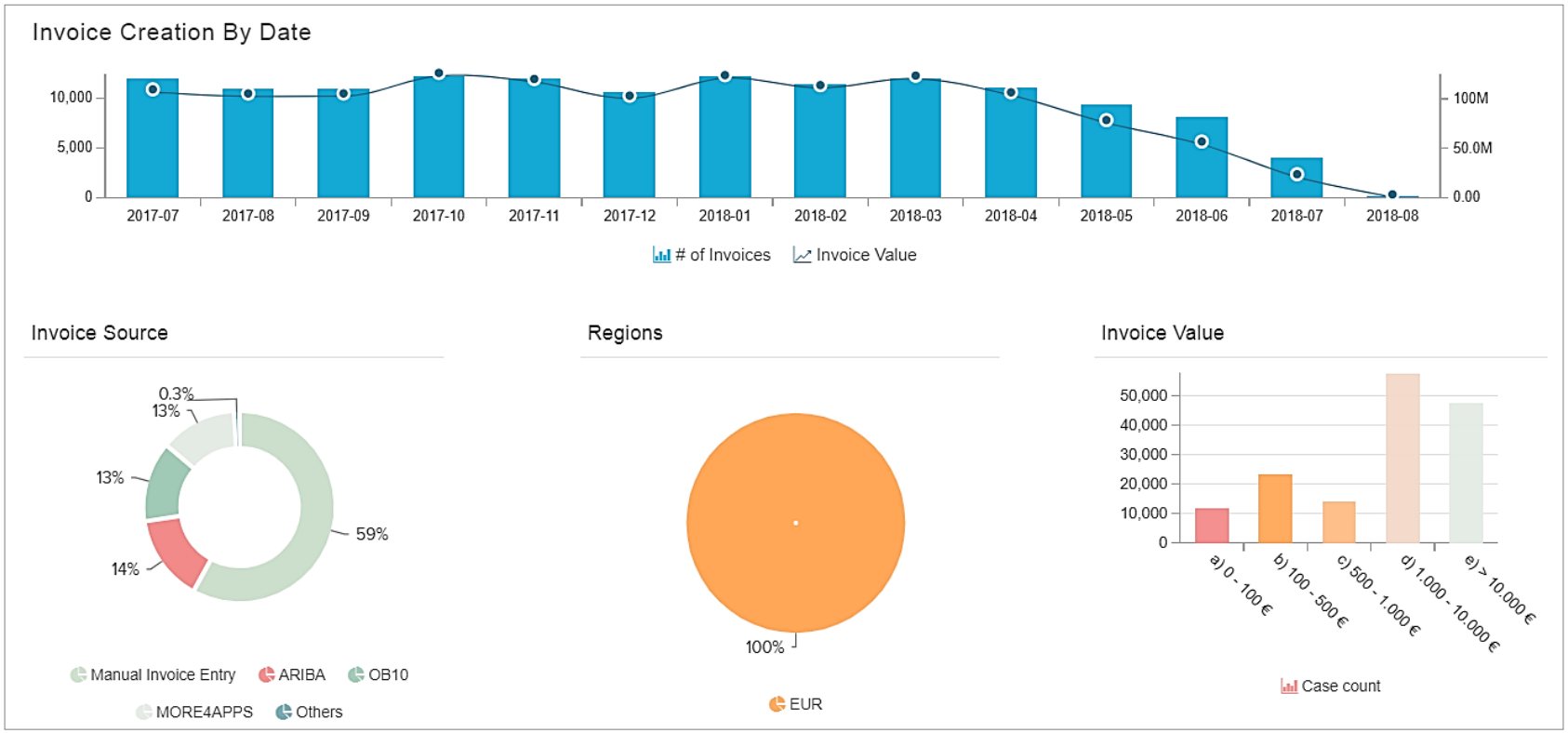
- **Process**: Accounts Payable (Invoice to Pay)

  Note: As the analysis is based on data only from Oracle, the payment data relates to the preparation of the payment batch to the bank, not the actual payment executed from the bank account.
- **System**: Oracle
- **Time period**: 12 months (1July 2017 – 5 August 2018)
- **Geography**: EU region (trade only)
- **Scope Exclusions**: Excluding inter company and employee expenses
- Full population of data provided also included other regions (US, MX, CN), intercompany and employee expenses.

DATA IN SCOPE OF THE ANALYSIS

Scope of Analysis

#Invoice Lines	#Invoices	Net Value	Variants
304k	154.9k	1.5b €	13.9k



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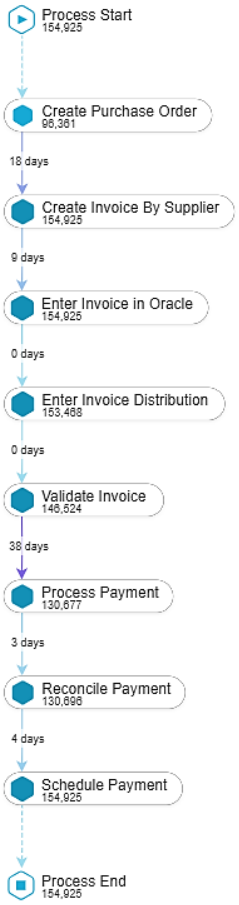
PROCESS OVERVIEW

The Happy Path



Deviations

Total **13,913 variants** in the process.

Percentage of invoices covered by the variants (cumulative):

# of Invoices	Value	% of invoices	Variants
18,920	165 m€	12%	1 (happy path)
40,712	324 m€	26%	1-4
77,481	645 m€	50%	1-17
115,427	1,02 b€	75%	1-90
154,923	1,50 b€	100%	>90

SUMMARY OBSERVATIONS

Average time to validate invoice	**ARIBA** invoices reach 'Invoice Validation' around **4 times faster** than the Manual Invoices from the point the invoice was created by supplier.
PO created after invoice date	**5%** of total invoices in scope had a PO created after the invoice date.
Late payments	**19%** of in scope invoices (by value) were paid after the invoice due date.
Rework (excluding OB10)	**28% of Rework** in total. Manual invoices and **More4Apps** have a significantly higher Rework Rate (**33% and 38%**) compared to Ariba (**4%**).
One or two time vendors	**34% of suppliers (1,809)** had 1 or 2 invoices over the period in scope (i.e. 13 months).

AVERAGE TIME TO VALIDATE INVOICE

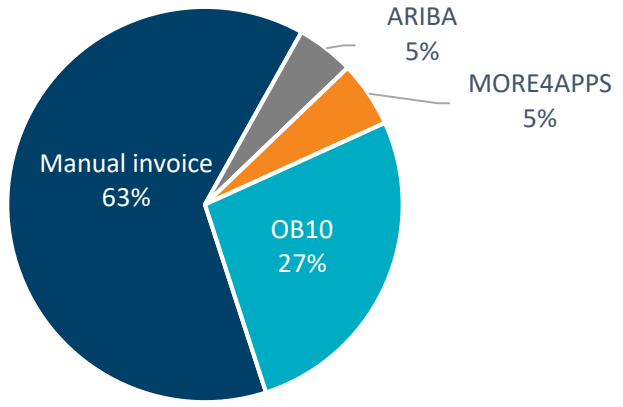
Average time to validate invoice

ARIBA invoices reach from 'Create invoice by supplier' to the 'Invoice Validation' activity (i.e. GL entry) around **4 times** faster than the Manual Invoices from the point the invoice was created by supplier.

By Invoice Source	#of Invoices	Invoice Value	Av. days
Manual invoice	82,851	946,700,255 €	20
ARIBA	21,908	70,725,560 €	5
OB10	19,754	401,639,562 €	10
MORE4APPS	17,534	80,737,808 €	15
RECURRING	39	50,296 €	5
Grand Total	**142,086**	**1,499,853,481 €**	**15**

By Supplier Type	# of Invoices	Invoice Value	Av. days
Direct PO	54,699	990,980,933 €	14
Indirect PO	52,304	257,700,795 €	16
Direct non-PO	66	3,165,584 €	38
Indirect non-PO	21,838	149,015,708 €	23
Freight, Other	13,179	98,990,461 €	8
Grand Total	**142,086**	**1,499,853,481 €**	**15**

% from Total Invoice Value Going Through Validate Invoice Activity



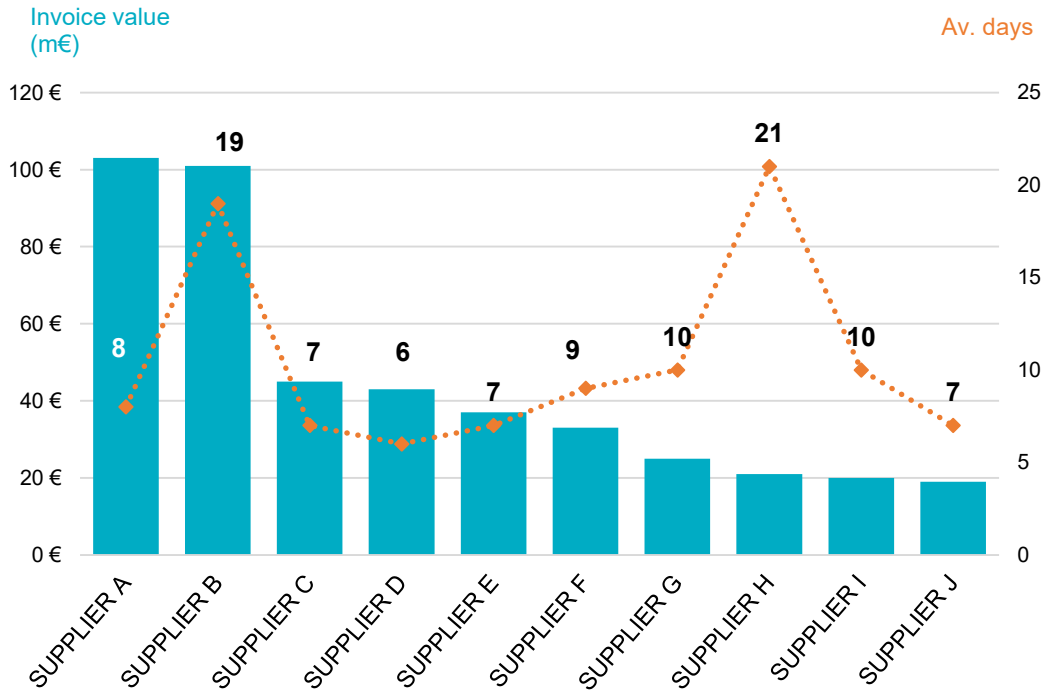
Notes:

- Total 142k invoices go through 'Create invoice by supplier' followed anytime by 'Validate Invoice' activity, this excludes invoices that went through these activities within the same day or were cancelled (which is 6,008)
- 5% of invoices do not go through the 'Validate Invoice' activity, of which majority are credit invoices

AVERAGE TIME TO VALIDATE INVOICE

By Top 10 Direct PO Suppliers (by value)

Supplier **H** has the highest number of average days to validate invoice **(21 days).**



Direct PO supplier	# of Invoices
SUPPLIER A	3,769
SUPPLIER B	5,073
SUPPLIER C	1,988
SUPPLIER D	2,304
SUPPLIER E	801
SUPPLIER F	2,034
SUPPLIER G	1,194
SUPPLIER H	53
SUPPLIER I	819
SUPPLIER J	1,096

LATE PAYMENTS

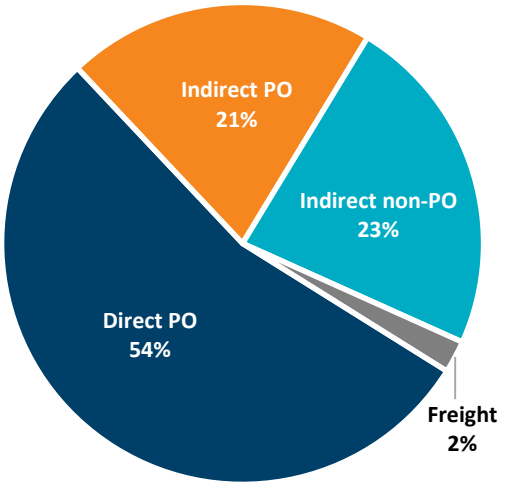
Late payments

- **19%** of invoices (by value) out of the total in scope invoices were paid after the invoice due date.
- **Indirect PO** invoices have the highest average number of days **(49)** the payments are paid late.

Supplier Type	# of Invoices	Invoice Value	% of total Supplier type Invoice Value	Av. days late
Direct PO	9,032	150,328,326 €	15%	27
Indirect PO	11,384	57,552,700 €	22%	49
Direct non-PO	33	1,310,938 €	42%	37
Indirect non-PO	9,107	63,118,707 €	42%	36
Freight, Other	3,441	6,033,544 €	6%	17
Grand Total	**32,997**	**278,344,215 €**	**19%**	**36**

Invoice Source	#of Invoices	Invoice Value	% of total Invoice Source Invoice Value	Av. days late
Manual Invoice	22,036	208,121,286 €	22%	40
OB10	2,482	47,943,269 €	12%	14
MORE4APPS	5,741	12,508,275 €	15%	28
ARIBA	2,603	9,584,980 €	14%	20
Recurring	135	186,405 €	19%	9
Grand Total	**32,997**	**278,344,215 €**	**19%**	**36**

% from Total Paid Late Invoice Value



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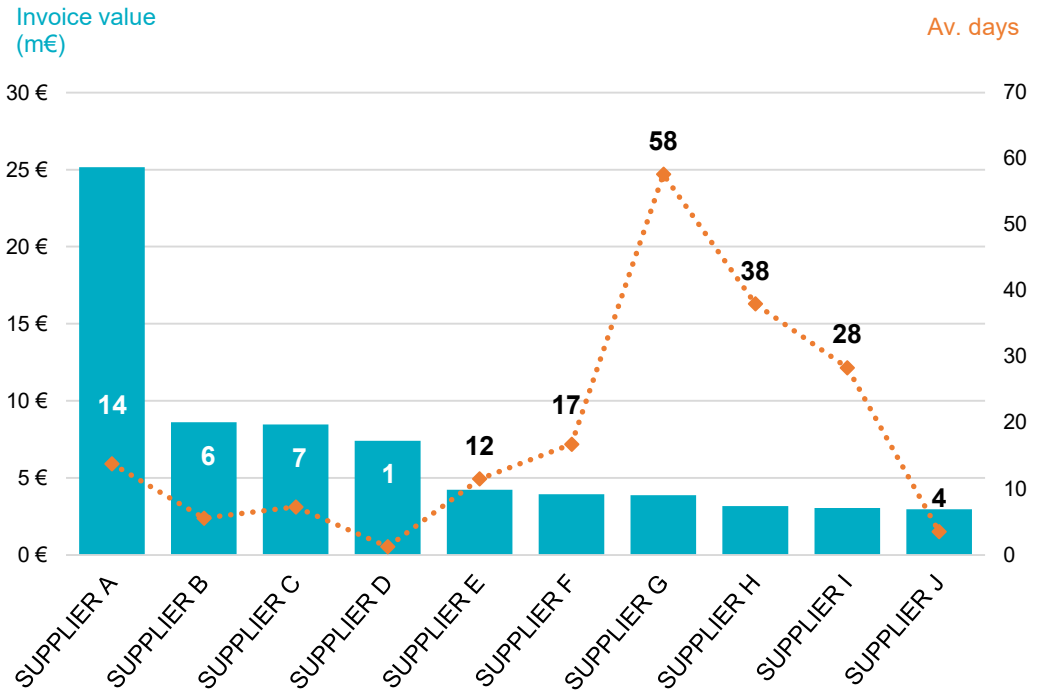
AVERAGE TIME TO VALIDATE INVOICE

By Top 10 Direct PO Suppliers (by value)

Supplier **G** has the highest number of average days invoice was paid late **(58 days).**



Direct PO supplier	# of Invoices
SUPPLIER A	1,288
SUPPLIER B	418
SUPPLIER C	391
SUPPLIER D	156
SUPPLIER E	184
SUPPLIER F	12
SUPPLIER G	145
SUPPLIER H	183
SUPPLIER I	143
SUPPLIER J	82

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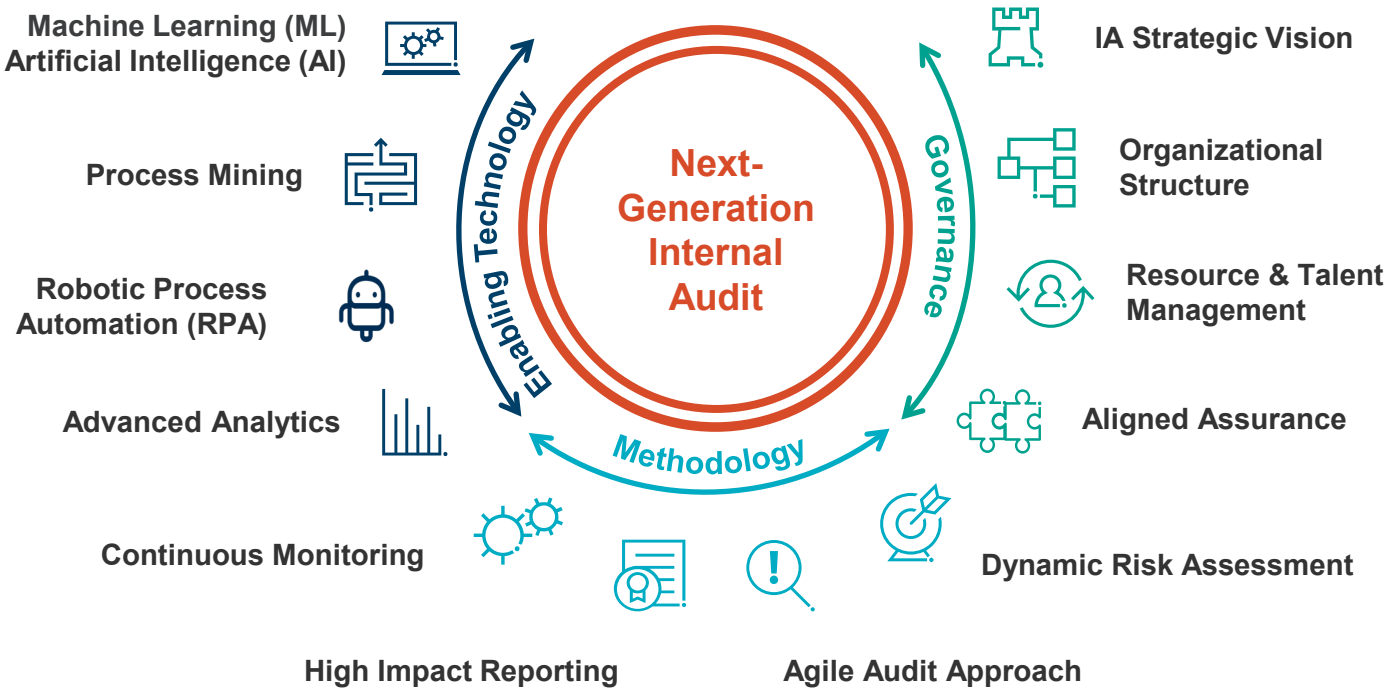
RECAP

RECAP - OUR VISION FOR NEXT-GENERATION INTERNAL AUDITING

The specific governance structures, methodologies and enabling technologies that next-generation internal audit groups introduce vary. However, nearly all of the transformations Protiviti has supported have addressed most, if not all, of the following competencies, qualities and components in three broad categories:



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THE GAME PLAN

It's time to start thinking differently. Internal audit…are you ready?

Key Success Factors

- Establish an agile mindset
- See the forest
- Empower your people to innovate
- Seek quick wins
- Recognize two sets of ripple effects
- Integrate adaptability into the design

Internal audit functions will soon look and operate very differently than they do today. As the current pace of innovation accelerates, the current challenges internal audit functions confront while delivering on their core mission will only intensify.

By choosing to disrupt their functions proactively rather than waiting passively to be disrupted, future-minded CAEs will boldly take their functions to new frontiers of performance.

Q&A

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Thank You

Face the Future with Confidence

Gregg A. Wishna
Associate Director
gregg.wishna@protiviti.com

1180 W. Peachtree Street, Suite 400
Atlanta, GA 30309

Office: 404.240.8373
Cell: 404.324.7518

protiviti®
Face the Future with Confidence

Justin Shirley
Manager
justin.shirley@protiviti.com

1180 W. Peachtree Street, Suite 400
Atlanta, GA 30309

Office: 404.240.8362
Cell: 404.775.5119

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