

# Guidance on unlocking the value of Internal Audit functions by implementing Data Analytics / Science

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## About ECIIA

The European Confederation of Institutes of Internal Auditing (ECIIA) is the professional representative body of 34 national institutes of internal audit in the wider geographic area of Europe and the Mediterranean basin.

The mission of ECIIA is to be the consolidated voice for the profession of internal auditing in Europe by dealing with the European Union, its Parliament and Commission and any other appropriate institutions of influence. The primary objective is to further the development of corporate governance and internal audit through knowledge sharing, key relationships and regulatory environment oversight.

## About ECIIA Insurance Committee

ECIIA set up an Insurance Committee<sup>1</sup> in 2012 with Chief Audit Executives of the largest European Insurance companies. The mission of the ECIIA Insurance Committee is: “To be the consolidated voice for the profession of Internal Audit in the Insurance sector in Europe by dealing with the Regulators and any other appropriate institutions of influence at European level and to represent and develop the Internal Audit profession as part of good corporate governance across the Insurance Sector in Europe ». ECIIA represents around 47.000 internal auditors and around 12.000 are active in the insurance sector. The

paper describes the results of discussions amongst the Committee members and we want to thank the Committee members for their input and Peter Jones, Head of Data: Internal Audit, Legal and General; Sophie Krynauw, Functional Audit Director, Zurich; Robert Stephan Zergenyi, Head of Data Science & Data Analytics, Internal Audit Director, Zurich; and Chiara Ziliani, Head of Group Audit Analytics, Generali; for their collaboration.

<sup>1</sup> **Stephen Licence (Legal & General) and Committee Chair, Amaury De Warengien (Axa), Nora Guertler (Generali), Ann-Marie Andtback Beckman (Sampo Group), Martin Studer (Zurich), María Luisa Gordillo Gutierrez (MAPFRE), Andrea Joham (Uniqa Group), Dr Jeannine Bartmann (Allianz Group), Astrid Langeveld-Vos (Achmea).**

The current risk and control environment has caused a shift in the Internal Audit (IA) profession. The events of 2020 have been a catalyst for widespread digital transformation and change, creating a rapidly evolving risk landscape, centred around an increased availability of data and growing automation of processes. This has fundamentally changed the demands from IA key stakeholders, which requires internal auditors to make a choice about what the future of assurance looks like.

Whilst the mandate of IA functions has not changed, auditors need to continue to provide assurance, audit teams should consider the

need to make data a key part of how the function operates. IA functions can transform to giving rapid, fact-based assurance, supporting organisations to achieve their strategic goals more effectively, whilst operating within the parameters of the mandate.

To become a data-led IA function, Chief Audit Executive's (CAE's) must first acknowledge that the demand for data analytics and data science (DA/DS) in IA is growing across all industries, with increasing calls from regulators to incorporate DA/DS into IA methodology.

Undertaking this journey is essential for IA functions to remain effective and continue to add value to their stakeholders.

It should be noted that adopting a data-led approach doesn't replace the need for the auditors to apply professional judgement and abandon other auditing techniques. Data is a powerful, complementary asset that all auditors should systematically consider in the audit approach as a factual basis which should factor into professional judgements needed to reach an opinion.

This document will guide through the practical considerations of how and where to invest in order to transform IA into a data-led function. It identifies five areas within the audit process where a data-led approach can add value, insight and assurance. This is built upon the lessons

learnt from IA functions which have already progressed on the DA journey and are in various stages of maturity.

## Changing nature of insurance and the implications for IA functions

The market context in which insurance companies are operating in is fundamentally changing, with data widely acknowledged to be the key currency of future success. Insurance companies are creating and using huge quantities of data across the value chain, investing in new products and offerings leading to increasingly complex processes and related risks.

While data is recognised to be the key to unlocking huge value in insurance undertakings, its quality, structure and meaning can often be affected by legacy systems, acquisitions and new technologies which have required rapid development at the expense of good data management and related

disciplines. This usually results in a poor understanding of data lineage (where and how data is created within a given process, captured and stored within an operational or downstream platform). Consequently, differences arise in definitions of the data, with varied aggregations and groupings, as well as a lack of transparency, having a meaningful, but often unseen, impact on the data itself. New tools and workarounds result in compounding layers of abstraction from the original data context and, if this is not addressed, the situation will worsen over time.

As the returns from using data in the first line become more rewarding and empowering from both the availability of data and

the new tooling, more analysis is possible. Although this is a great opportunity, it also brings risk: data becomes harder to control, de-risk and subsequently audit. Consequently, the expectations on IA are changing rapidly with stakeholders demanding assurance that risks are being adequately controlled in this frequently changing risk landscape.

**This leads to a key question:**

***“In an increasingly data-driven environment, how does an IA function provide value, assurance and insight to match the speed of risk?”***

There are many possible answers to this question, and the right one

will depend on the specific needs of the insurance undertaking. Furthermore, CAE's must get a more comprehensive and precise understanding of what is possible by using analytics, looking at what similar insurance undertakings are doing, discovering what is needed to advance those capabilities, and learning how to spread this knowledge within the IA function.

On the journey to becoming data-led, the audit function will need to be 'agile' and prepared to change as the insurance undertaking transforms. Make small steps, try new ideas, iterate, and fail fast to identify what is possible and which of the analyses bring the IA function the most benefits. There are a great variety of questions that a data-led IA Team can address, especially as Internal Audit teams typically cover

## Changing nature of insurance and the implications for IA functions

the full breadth of an organization's value chain.

Whatever the IA function decides to focus on first, it is important to recognise that it is often not possible to instantly jump to having full access to every data set or system. Therefore, it is important to understand that the journey to becoming a data-led IA function is a long one and to set short- and medium-term goals. It is not too late to start on this journey but the longer CAE's delay, the greater the gap between assurance techniques and the actual control environment.

As IA functions advance on the journey, remember the benefits are not necessarily realised in year one and activities might slow down as effort is invested in upskilling the IA functions. Over time, a new

way of auditing (blending data methodologies with more traditional techniques) will mature and will realise significant benefits for all stakeholders.

## Outcome – What is the benefit for IA functions' stakeholders?

So, why should the IA function start this journey if it is going to take a long time and pay back on investment can be slow?

The benefits of data-led auditing are manifold, with the major benefit at its core, and the main objective of any IA function, of providing high quality assurance to its key stakeholders: Audit Committees, Board, Shareholders, Management and IA professionals. When successfully executed, it leads to enhanced trust which is the true currency of our profession. These benefits are true for any organization type and size of IA function.

### 3.1 Insightful Audit Committee Risk Reporting

Audit Committees benefit greatly from the communication of outcomes of analytical procedures conveyed in Audit Committee reporting, providing additional insight into the context of the control environment and its resilience to risk. Visualisation of data can enhance storytelling in audit reports and be used for any part of audit reports, in contextualisation, risk view, result presentations. Today's tools allow the production of powerful graphics and dashboards, while advanced tools also enable data visualisation in 3D, virtual reality and hologram as

alternative ways to story tell to the audience. Clear communication provides additional benefits to engaging with first and second lines.

### 3.2 Risk, Outcome based and forward-looking assurance

Data procedures allow IA functions to take a more forward-looking view on providing assurance over business outcomes. DA/DS is of great benefit in risk identification, planning and scoping, allowing resources to be deployed where they matter most for the insurance

undertaking, and areas of highest risk. DA/DS support outcome-based auditing based on the vast amount of available data sets, with data science even allowing prediction of where risks could impact business outcomes.

### 3.3 Efficiency, timeliness and automation

The use of DA/DS within IA methodology allows, with some initial investment, the production of audit results more efficiently, in an agile way, with more timely reporting through utilising the most recent information available. The benefits include:



# Outcome – What is the benefit for IA functions' stakeholders?

- Consistency, repeatability and quality of audit products from standardization of analytical tests.

- Data analytics software supporting data extraction from any source.

- Data compilation, extracting datasets of different sources and gaining strong insights when data is spread across multiple files, systems, and solutions.

- For repeatable tasks, automated data analytics can be developed, such as tests that can be easily reused and re-deployed, or constantly available dashboards showing key metrics.

- Automatic connectors can analyse data sets in real time, or at any given interval tests can be re-run.

- Trends and risk patterns can be

identified over several cycles/over a long timeframe by using metadata information such as timestamps, access (transactional data sets).

## 3.4 Advanced analytics

Firstly, advanced analytics can augment standard analytical procedures. For example:

- Artificial Intelligence (AI) based natural language processing can work like human auditors and identify patterns in structured or unstructured data for risks, fraud or control issues.

- Machine Learning (ML) can learn from past events to identify potential fraud.

- Network analysis can help identify relationships of risks and transactions and visualize these. This enables analysis

of end-to-end processes and customer experiences, rather than reports being constrained to single systems or business units.

- Advanced process mining can support to identify a process flow based on transaction records, identify control gaps and exception from policies and process standards and prepare data for graphical process visualisation and further analysis.

- Advanced analytics can be used to then efficiently and independently test business processes for controls and outcomes. Analytical procedures can be used to test for more standard processes such as claims, underwriting, but also for new products, parametric insurance, risk and price models, claims prediction.

## Outcome – What is the benefit for IA functions' stakeholders?

### Case study

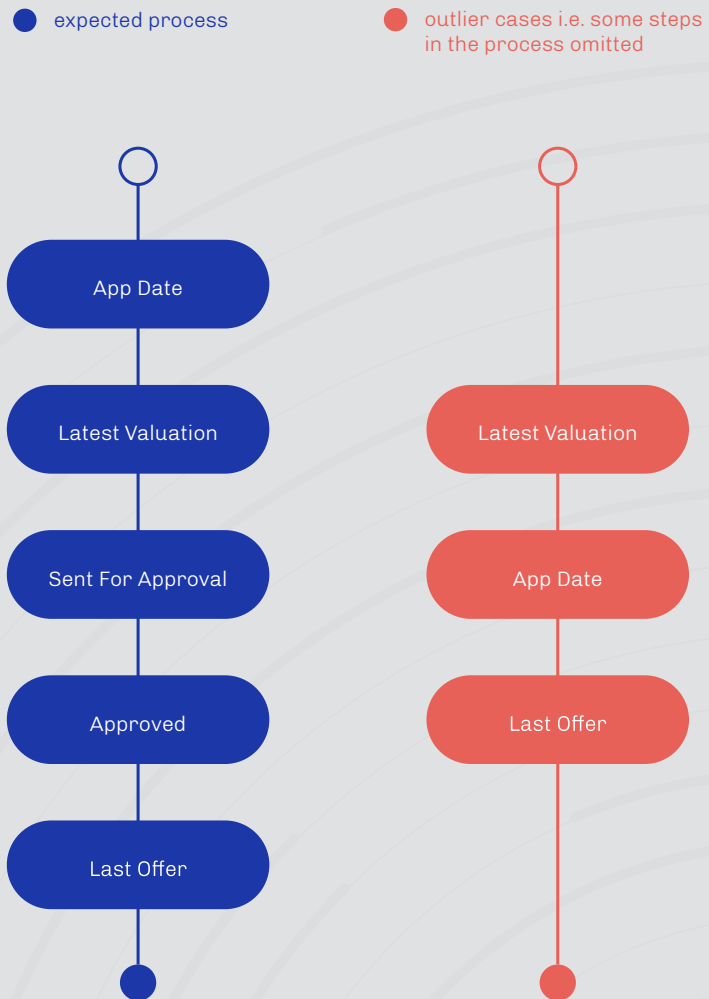
#### Home valuations for equity release products

**Summary: Whole population data can be coupled with process mining techniques to help to identify deviations between the planned process and the path that real transactions took. Process Mining techniques showed that the vast majority of applications followed the 'blue path', which is the expected business process. However, process mining also showed that a small number of applications followed the 'red path' which omitted some steps and had some steps in the wrong order. This alerted us to errors in mandatory data capture during the process.**

Following this finding, traditional audit testing showed that although the outcomes tests showed no harm had occurred (no financial losses or customer complaints), the control design was flawed and required process improvement. Audit was able to provide additional assurance across a whole population but control improvements agreed with management addressed a tangible risk.

A second, but very important, factor is the need for auditors to gain knowledge of methods like Machine Learning when deployed on key models within the business. If we are unable to audit these techniques, this could impose unmanaged risks to the insurance undertaking.

## Outcome – What is the benefit for IA functions' stakeholders?



### 3.5 Job and career progression/ professional education

Powerful analytics and robotic automation are not driving auditors out of jobs but shifting the profession towards the most effective auditors being both business and technology savvy. One important factor and benefit of implementing DA/DS is the upskilling effect, providing internal auditors with the tools and techniques to cope with fast changing job demands. Analytics can be a lever for embedding new talents on the job market (Generation Z and younger) and can support transformation in flatter hierarchies based on the meritocracy of ideas. There is a huge demand in the job market for these skills and training in

these areas can be a powerful talent attraction and retention tool.

Additional positives include:

- *Providing advanced career paths for upskilled auditors and data analysts.*
- *Job enhancement due to automation of repeatable tasks and focus on high value procedures.*
- *Increased business understanding through a more thorough analysis of business data.*
- *Analytics can often be done remotely, allow flexibility in working.*
- *Increased collaboration and teamwork, contribution of different skill sets.*

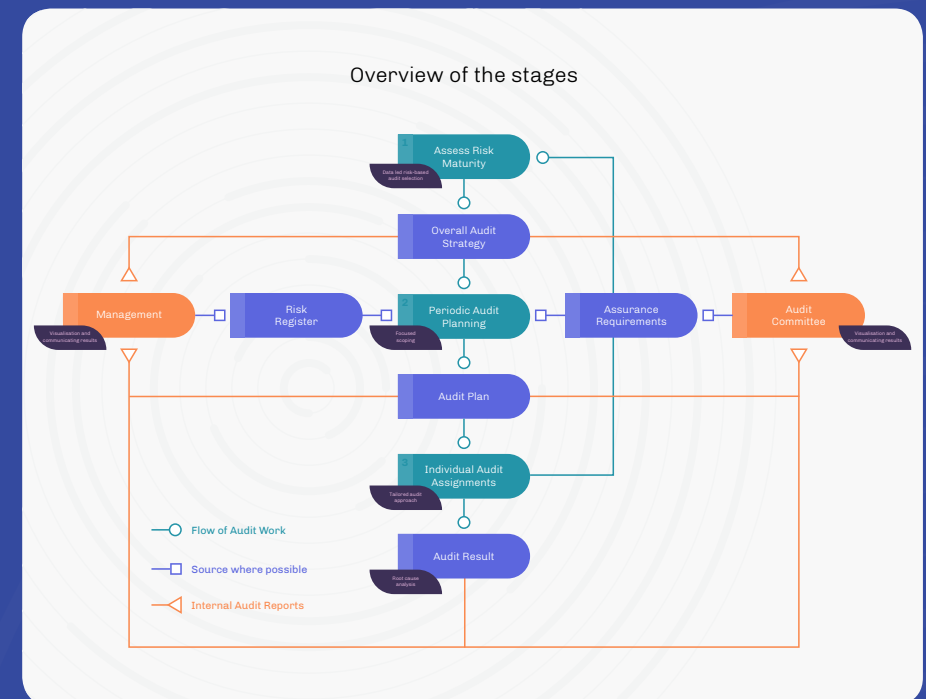
# Where and how to deploy DA/DS — Practical applications

## 4.1 DA/DS in the audit lifecycle

DA/DS can be fully integrated and used in all stages of the audit life cycle (see diagram on the right<sup>1</sup>) and has its greatest value if it is embedded across the entire audit lifecycle. It doesn't matter which stage of the audit cycle chosen to focus on first, either pick one or all and can adjust for the level of complexity depending on level of capacity and skills available within the IA function.

A common pitfall is not fully exploiting the full value DA/DS brings and limiting it to enhancing fieldwork testing. Although this helps towards providing higher value assurance, it does not represent a radical change in

the way audits are conducted and does not allow us to get the real benefits attainable by a data-led IA function, such as more robust risk assessments, using external data to augment available internal information, using data profiling for audit planning and scoping, and the ability to carry out continuous monitoring and auditing.



<sup>1</sup> Source: Risk based internal auditing – Global IIA 201501guidetorbia.pdf (theiia.org) + annotation from industry best practice

## Where and how to deploy DA/DS — Practical applications

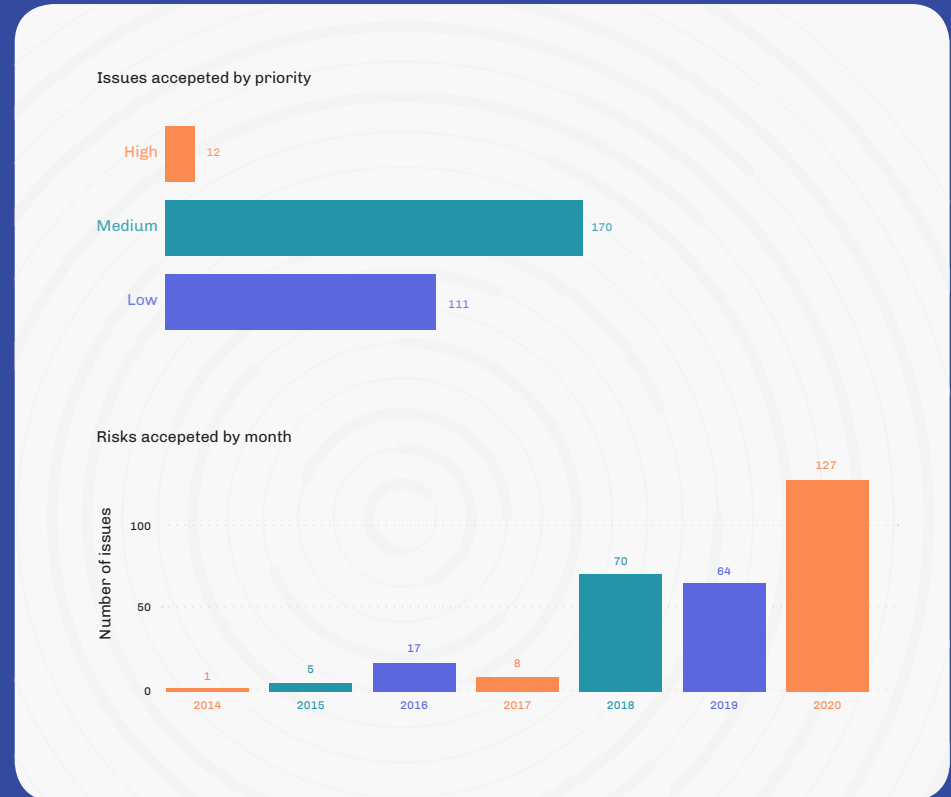
There are five main areas the DA/DS supports the IA life cycle:

### 1) Data-led, risk-based audit selection

Better informed decisions on how to prioritize audit plan coverage. Trends, relations and outliers of business data are observed as an input for audit planning, and risk scoring and visualization can be used (dashboards, trends, timelines). By using analytical procedures in planning and scoping, this can assist identification of risks and narrow the focus of key risks. Drilling into risk data from the top level provides a ranking of risk drivers categorised under defined risk areas and allows for country profiling with peer

comparison and trended views over time. More granular analysis can be undertaken using unsupervised learning such as clustering of all data points, trends and outliers. This can help identify previously unobserved patterns. For example, looking at changes in behaviour to risk acceptance over time demonstrates changes in risk profile.

Dashboards can support in a visual way identify, at a high level, patterns. Depending on the type of data, this can help to assess relative risks, risk triggers and highlights areas for possible investigation and further analysis.



# Where and how to deploy DA/DS — Practical applications

More advanced techniques include supervised and unsupervised learning. More granular analysis such as

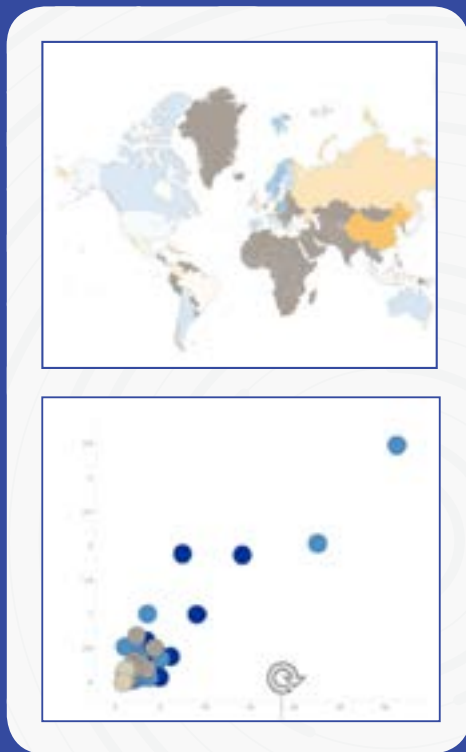
clustering of all data points. This can help identify previously unobserved patterns.

## 2) Focused scoping

Outcome indicators, including finance, expenses, quality assurance and operational effectiveness, can be assessed to profile areas of highest risk for an entity or process, in order to specify a focused scope for the identified audit. Profiling combined with business insights, data assessments –

leading to assurance based on the highest risk, with clearly defined scope. Multiple data sources help identify risk drivers and can also be used to profile the business context within business units or functions and, in turn, then help refine the scope and focus of the audit. Business profiling supports a detailed scope analysis, which can be based on different risk triggers, such as distribution, product portfolios, criticality, resilience, data:

undertaking. The above graph illustrates how a business unit profile compares to the Group view. This is used to identify the type of products in scope for each BU and to look for similarities between BUs.



In specific fraud risk areas, profiling for fraud risks supports risk-based scoping.

For example, analysis can be completed for Group and each business unit to have a clear view of how product mix varies across the Insurance

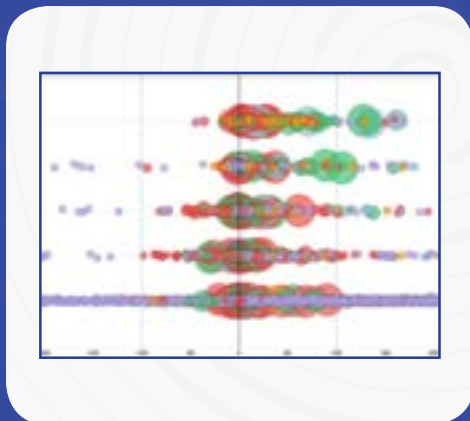


## Where and how to deploy DA/DS — Practical applications

### 3) Tailored audit approach

Data Analytics aids efficient / effective testing, with focus on outcome related assertions. Using advanced techniques such as natural language processing and machine learning to efficiently assess large, complete data sets. Assessing control weaknesses impacting outcomes and providing wider assurance. Expanding testing population analytical techniques enable to

use of full population, testing entire datasets directly at and from the source. Outcome based analysis uses techniques to identify if controls lead to expected outcomes. Cluster,



and outlier analysis supports to understand dependencies and exceptions to controls and process.

Different advanced methods such as network analysis allow learning

on transactions (treasury, finance, procurement, payments, claims). Per example network analytics can support identifying control gaps based on transactional data.

For example: Whilst auditing Life Technical Excellence (Underwriting), certain key aspects of the underwriting process were selected (Technical Price rates, age distribution, policy benefits distribution, exposure to COVID risk) to understand trends, gain insights of the process and select a data-driven sample (outliers detection).





# Where and how to deploy DA/DS — Practical applications

Method	Traditional Audit	Analytical Audit
<p><i>Descriptive</i> {What is happening?}</p> <p><i>Instead of taking a sample and trying to extrapolate, you are able to provide an opinion on the whole population so the accuracy of your findings is more reliable and issues are easier to scale.</i></p>	<p><i>Traditional audit method would use a sample set of data, based on tolerable and expected error or the previous years policy for conducting the below test areas:</i></p> <ul style="list-style-type: none"> <li><i>Identify overpayments and miss-postings;</i></li> <li><i>Identify potential irregularities such as duplicate payments to suppliers/beneficiaries;</i></li> <li><i>Segregation of duties such as transactions with the same handler / approver;</i></li> <li><i>Payments over the authorization limit;</i></li> <li><i>Identify appropriate exchange rates have been used;</i></li> <li><i>Matching employee bank details to supplier/beneficiaries bank details.</i></li> </ul>	<p><i>Audit analytics can perform the below tests on the entire population of data to provide reliable insights to understand impact of changes and best process controls:</i></p> <ul style="list-style-type: none"> <li><i>Profiling of the business area being investigated;</i></li> <li><i>Identify overpayments and miss-postings;</i></li> <li><i>Identify potential irregularities such as duplicate payments to suppliers/beneficiaries;</i></li> <li><i>Segregation of duties such as transactions with the same handler / approver;</i></li> <li><i>Payments over the authorization limit;</i></li> <li><i>Payments close to the limit (smurfing);</i></li> <li><i>Payments to employee / non suppliers;</i></li> <li><i>Payments approved but not paid;</i></li> <li><i>Identify appropriate exchange rates have been used;</i></li> <li><i>Matching employee bank details to supplier/beneficiaries bank details;</i></li> <li><i>Timing issues;</i></li> <li><i>Data quality, profiling and governance checks.</i></li> </ul> <p><i>From efficiency and continuity perspective, analytical scripts can be re-used for periodic cash payment audits resulting in efficiency benefits by avoiding repeated manual analysis.</i></p>

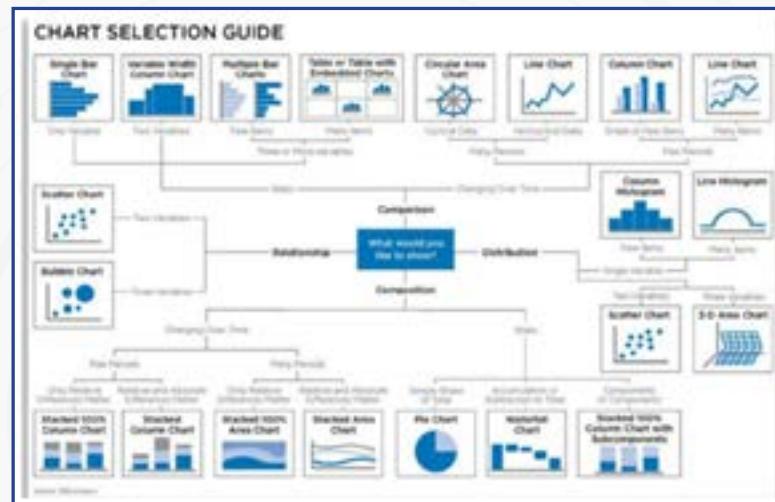
4) Root Cause analysis

Different statistical methods, such as multivariate statistics (statistical regression, etc.), hypothesis testing, and advanced methods such as unsupervised learning, cluster analysis, issue tree, structural fix and AI/ML based techniques, can support root cause investigations. Using data to assess root cause will allow IA functions to increase the impact and efficiency of the assurance provided within the parameters of the IA mandate.



5) Visualization

DA/DS allows for more impactful Reporting to Management and Boards of Directors. Techniques used are visual stories, relationship



# Where and how to deploy DA/DS — Practical applications

graphs to show context, risks and findings. The graphic above demonstrates the wide range of ways to visualize data.

## 4.2 Considerations on where to start

A good way to start this process is to identify the highest value questions to answer for the Audit Committee. Suppose for a moment that the IA function decides that GDPR compliance is the key risk/ opportunity: forget about what data is currently available. Consider what data sets would ideally be used to answer this question (if access to data was not an issue). What tests could be conducted to check that the insurance undertakings are GDPR compliant? and what data would be selected to answer these questions? This type

of exercise/thinking will help to identify the data strategy and priorities. Hypothetically, what data would be chosen to answer this? Risk system data? People data? Finance data? Start to map out what is needed to be effective in carrying out the analysis.

Once the audit team has decided what areas to focus upon, it will be easier to decide where to start and what technologies and tooling (enablers) are required to achieve the IA functions data-led ambitions. More generally, when determining which stage of the process to start with, consider the following in order to assist prioritization and focus of DA/DS implementation:

- *Availability and reliability of data – Which sources of data are readily*

*and easily available? How mature is the insurance undertaking data management capabilities? Has the business implemented data quality management? One possible starting point to assess these capabilities and increase assurance is to audit the data capabilities of the insurance undertaking. The results can be used to increase controls and reduce risk around data management, allowing increased DA/DS capabilities for assurance functions.*

- *Technological / Digital capabilities– How advanced are the organizational digital capabilities? What systems are used to manage and collect data? Are these systems interconnected? Do the systems use new technology? Are internal auditor teams able to appropriately address technology risk if data is not readily available? Which data is centrally available, managed by central system, and which data sits in local systems?*

*Can data be easily assessed? Is the data in a form/format that can be used for analytical procedures? Is metadata information available and documented?*

- *Data Models: Are advanced models in place? Where does the insurance undertaking use AI/Machine Learning in models? How do we audit it and assure ourselves that there are not errors or unintended bias in our models?*
- *Operational – Does existing reporting frameworks align to the current risk universe? Are there gaps in operational reporting which allow problems to go undetected? Does following a traditional process methodology create blind spots in the assurance provided? Does the IA function fully understand the risk universe?*
- *Legal - How can we use data to*

*ensure the insurance undertaking is in compliance with necessary data laws i.e. GDPR, ethical use of data?*

### 4.3 Enablers (Tools)

Most important elements to consider when implementing tools are:

- **Collaboration:** *In this context, the selection of a data analytics software adopted globally plays the role of “aggregator”, allowing teams to benefit from supporting each other and be supported by the champions, as well as create collaboration networks and develop synergies. The objective should be the primary factor in selecting the appropriate tool: insurance undertakings should avoid bringing in a Ferrari when an economy car can do the job.*
- **Ease of use:** *The more user-friendly the tool, the more popular it will*

*be with beginners. Tools that allow clicking and coding make the process easier for beginners and advanced users to work efficiently together.*

- **Security/auditability:** *As with every data manipulation/analytics tool, security, data privacy, traceability and auditability need to be primary features.*
- **Multitenant, operability, global access:** *For larger insurance undertakings, a server type solution might be a better option.*
- **Cost:** *Return on investment considerations should include costs (purchase price, maintenance, licensing, employee training, etc.): license consideration and models can vary if the goal is onboarding the whole (or the majority of) the IA community.*

There are a multitude of

## Where and how to deploy DA/DS — Practical applications

commercial off the shelf (COTS) Data Analytical and Machine Learning tools available (SAS, TIBCO, Alteryx, DataRobot, IBM, Dataiku, Microsoft, etc.). In Data Science, there is also a huge community developing open-source algorithms and modules, mainly based on Python and R(+).

For visualisation and business analytics, Business Intelligence (COTS) platforms are also often used (Microsoft Power BI, Tableau, Qlik, etc.).

There are also tools on the market which come from an audit management or GRC (Governance, Risk and Compliance) development background (ACL, Teammate, Metric stream, Archer, IBM, Open Pages, Bwise, etc.).

For process mining, there are set of established COTS tools in the market, such as Celonis, UiPath, Invenio, Aris process miner. In addition, there are open source process miners either as platforms or algorithms maintained by a growing DS community.

All these enablers/tools have their strengths and weaknesses, so IA functions often use a combination of tools to achieve their desired outcomes.

Implementing a data-led IA function is primarily a cultural change program, to win the hearts and minds of all relevant stakeholders. People are key to success of any change programme, and this is also true for implementing data-led auditing. There are two aspects to consider when thinking about the people aspect of data-led auditing:

1) How are the risk skills identified and obtained?

2) How to create a cultural mindset shift to place data at the heart of the internal audit approach?

## 5.1 How are the risk skills identified and obtain?

There are several choices that can be made to achieve the

right data skills within the IA audit function:

- *Should skills be recruited, or existing employees trained?*
- *Should everybody or a few be trained? And to what level of proficiency is required to be achieved?*
- *What depth of skills is required within the IA function versus leveraging capability within the wider insurance undertaking?*
- *Should the IA function collaborate with other internal functions (1st, 2nd line) to develop the required skills for example design development and rotation programs?*
- *What speed does the IA function want to advance data-led auditing?*
- *What does the career path look like for different levels of data skills?*

*i.e. A professional data scientist has different career development pathways compared to a business internal auditor with basic analytics skills.*

Depending on the answers to the above questions, it will drive the level of adoption of data skills within the IA function and speed at which the data strategy ambitions can be realised. Whilst requiring every internal auditor to have a deep knowledge of data analytics might not be the initial solution, a minimum standard should be to ensure every internal auditor has a basic knowledge of data analytics allowing for internal auditors to recognise situations where the use of analytics would bring value to the assurance being provided.

Regardless of the level of

adoption of data analytics, the IA function must ensure the identified individuals / teams have the proper training and capacity to implement the data analytics strategy. An upskilling program should be embraced focused on data analytics skills for internal auditors and including use of data analytics tools.

From experience, a mixture of recruitment and training is recommended. Learning on the job is key for data analytics, so internal auditors and analysts should be supported by subject matter experts and experienced data scientists, as well as receiving direct learning sessions on tools and methodology, in order to achieve the best results. Informal learning is key to success, augmented with



formal training sessions, i.e., online learning sessions.

To build capability and confidence will take time, potentially years, and the training strategy should reflect that. Training should not only include how to undertake the technical data work but also how to interpret and communicate what data-led auditing means to key stakeholders. Building up success stories to demonstrate the value of the data-led approach is critical to tackle the mindset shift, so dedicating a few individuals to solely focus on data will assist in creating the necessary energy behind the change.

### 5.2 How to create a cultural mindset shift to place data at the heart of the audit approach?

The cultural mindset shift needed to achieve the IA functions data-led audit ambitions should not be underestimated. It will impact not only the IA function members but the Business, Auditee and Audit Committees. Remember to consider all stakeholders in the change management approach.

The first element needed to succeed is a clearly defined strategy, documented and communicated to the audit community. If CAE's simply starts asking people to make it happen, it won't happen.

A vision is necessary and must be communicated on a regular basis so that everyone understands why the change is necessary. It needs to be accompanied with a roadmap over a 12-24-month period, setting out where the IA function wants to be, and how it plans to get there. The CAE should set a comprehensive plan, covering multiple aspects: operating model, technology, capabilities and skill set, methodology, processes and communication.

Milestones on the roadmap should be realistic, and the plan should be implemented through quick-wins selected for their high potential to demonstrate visible success – in other words, pick battles big enough

to matter, small enough to win (Jonathan Kozol).

To support the roadmap, robust pillars must be present:

- *Strong sponsorship and communication*
- *Team of resources with the right combination of skills*
- *The right tools and technology*
- *Clear governance, measures and a continuous improvement program*

Regular cascading of the strategy, as well as communication of new milestones reached, is essential to set a positive tone and maintain the focus. Promotion of data analytics value for IA must be continuous. CAE might consider

the use of “champions” to drive the change towards the use of data analytics, encouraging increasing use of analytics, including basic usage by the whole team.

A key outcome from this guidance document is to provide practical insight into lessons learnt to aid challenges IA functions might face implementing a data-led IA function.

#### Measuring and sharing success

The CAE must identify metrics to measure the success of data analytics implementation efforts (i.e. number of audits supported by the use of data analytics, mapping of training performed by the auditors, if a data analytics tool has been acquired, number of related licenses), and always report success and progress externally to key stakeholders, and internally within the IA community.

Reporting to business stakeholders a tangible

demonstration of value will boost IA's reputation and credibility:

- *Reporting findings to auditees, supported by data / evidence, will make communication more effective as it is based in fact (reducing room for objections). Often, the techniques used by the auditor will be considered as part of the possible remedial action and implemented as controls /continuous monitoring. This establishes a positive relationship between internal auditor and auditee, with the use of data visualization techniques emphasizing key findings and information;*
- *Most undertakings have digitalization as a target. Leveraging DA will build on the investment in digitization and can help to drive adoption as techniques used in audits are adopted.*

Also, communicating success to IA community will represent

a powerful influencing message and will be a positive step toward building a data-led IA function: cascading of the results achieved will convince change-resistant individuals and further motivate the others; if done on a continuous basis will be more and more perceived as business-as-usual; and if done in a “celebrating” mode will engage the whole community, as they will feel being part of a successful story.

#### Resistance to change

The hardest part of any business transformation is changing the culture. One common pitfall is the underestimation of change resistance, which could represent one of the greatest obstacles to a successful data analytics implementation. One of

the big challenges will be gaining acceptance from auditors but with continual communication it can help people feel that the use of analytics is the “new normal” and should represent a natural component of every audit.

A way to overcome this is to have a clear strategy, (over) communicate, introduce performance management based on successes and good examples and lessons learnt (be open with the bad examples), encouragement, review process, and setting top-down expectations in the use of analytics in the audit plan based on outcomes. Engaging with volunteers as first steps in a playful way is an organic way to grow appetite.



## Balance between resource and reward

The lack of skills is one of the biggest challenges faced when it comes to implementation of data analytics. For external hiring, any IA function is on competition due to the scarcity of data scientists in the market. Internal resource constraints, along with business-as-usual workloads, can limit internal audit's ability to optimise its data analytics efforts, but generates rewards when balanced with efficiency improvements. Training people up to the desired level of knowledge takes time, and there is a natural gap between the theory learnt and its application in audit, often combined with a time lag between the two.

## Underlying data

The value available from data analytics available is only as good as the available underlying data. This can be impacted by data availability, quality, completeness, integrity, location (cross border transfer) and ability to compile. Data quality and availability might represent a relevant obstacle to running analytics: understand where data sit, judge the quality, system constraints, coordination with corporate IT functions and needed data that the company does not collect. Data quality issues, shortcomings in data management always need to be assessed for their business impact and root cause. Data quality issues should be reported as part of the audit procedures

and support better controlled business processing.

Last but not least, sometimes business stakeholders themselves might slow down data access, for different reasons: data request can be perceived as possible objection to business decision, or simply they have limited availability due to time constraints, or again data retrieval might be challenging if access to source is not direct or data request is not standard.

Whatever the challenge, the ultimate consequence is the unplanned (or not always planned) extension of time needed to perform an audit; hence, IA functions at the beginning of data analytics

journey should allow in the planning for time buffers to handle possible challenges coming from lack of technical skills or difficulties in accessing or managing data.

In addition, data privacy (see *Appendix*) and confidentiality must always be maintained as well as fully considering the ethical use of data. The IA function must also be careful not to introduce bias or risk into how data is analysed and interpreted.

## Budget

Implementing a data analytics framework typically requires capital investment in at least two key areas: people (upskilling and new hires)

and technology; nevertheless, strategic investments today will drive efficiency in the long-term, and internal audit departments will be able to provide greater value to the insurance undertakings they belong to, and will be prepared for the future challenges.

#### Sponsorship

To avoid false starts, strong commitment and sponsorship from the top is needed. CAE must have the support from the Board and the Risk Committee and must be strongly committed in taking the necessary actions to push the data analytics journey ahead.

# Appendix: The European legal context

## 1) GDPR and Data Science

The GDPR regulation has been implemented in May 2018, 3 years ago and is impacting all undertakings in Europe.

GDPR also affects data science practice in three areas:

- GDPR imposes limits on data processing and consumer profiling. Undertakings may not use personal data for a purpose other than the original intent without securing additional permission from the consumer. This requirement could limit the amount of data available for exploratory data science and oblige companies to build robust anonymization

into data engineering and data science processes.

- for undertakings that use automated decision-making, GDPR creates a “right to an explanation” for consumers. As the interpretation of GDPR is unclear, most businesses that decline some customer requests understand that adverse decisions should be explained to customers. This is already common practice in the insurance industries and some businesses treat adverse decisions as an opportunity to position an alternate product. Nevertheless, it impacts the decision engines and must be considered in building data science techniques.

- GDPR holds undertakings accountable for bias and discrimination in automated decisions. This rule places an extra burden on data scientists who build predictive models, and on the procedures organizations use to approve predictive models for production.

Organizations that use automated decision-making must:

- *Ensure fair and transparent processing*
- *Use appropriate mathematical and statistical procedures*
- *Establish measures to ensure the accuracy of subject data employed in decisions*

In this context, an independent review by internal audit is useful.

## 2) EIOPA and Data Science

There is a large push by the policy makers (Specifically the European Policy Makers) on [Trustworthy Artificial Intelligence](#). On 22 June 2020, in its response to the European Commission’s Digital Finance Strategy consultation, EIOPA recalled that there are many opportunities arising from Big Data Analytics and digitalization more broadly, both for the insurance industry as well as for consumers, but there is also a number of risks that need to be further addressed in practice.

In The Solvency II directive, there are three key criteria for data quality which insurers must measure: accuracy, completeness and appropriateness. Legal responsibility for data quality ultimately lies with the insurer, regardless of how the data is sourced or aggregated.

The internal audit functions need to develop methodologies, skills and knowledge to give assurance on lawful, robust and ethical use of Artificial Intelligence of first and second line applications. If the audit

functions uses advanced data science methods for testing such as AI, it goes without saying that all standards needs to be applied, including

a well defined audit quality management processes and reviews.

Policy makers are increasing using data analytics and science themselves in their supervision process (SUPERVISORY TECHNOLOGY (SUPTECH)).



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