Technology Trends and Benefits in the Compliance Landscape

RegTech and Analytics are more than buzzwords, it is a very real movement that is already having an impact on regulatory compliance.

How should a company address compliance in a more efficient and less resource-consuming manner while improving the quality of the data reported to regulatory supervisory authorities?

How to effectively and efficiently design and integrate processes to create organization synergies and cost savings?

Will machine learning offer a revolution in risk management and compliance?

Leverage technology platforms across multiple risk areas to help prevent, detect, and respond to compliance and ethics breaches.

How to make Risk-based (automated) business processes to facilitate execution of Compliance programs departments intelligence and a culture of continuous improvement are being given an increased focus and a strong emphasis is placed on risk.

IT departments are becoming increasingly responsible for compliance and should develop expertise in the area.

The compliance effort is not sufficiently integrated into other business activities or technology.

How to utilize data, techniques, and solutions to analyze, predict, and create actionable insights?
Technology Trends and Benefits in the Compliance Landscape

Possible benefits are both qualitative, such as improved quality and enhanced reporting, as well as quantitative, such as higher efficiency.

- Less burden on the business units
- Increased line of sight of risk exposures
- Significant opportunity for higher efficiency
- Improved quality and effectiveness
- Proactive and Predictive
Technology Trends and Benefits in the Compliance Landscape

Challenges and potential benefits facing firms by taking in new technology

**Challenges:**
- **Digitization**
  Complex and heterogeneous internal architectural IT environment coupled with high lead times and costs.
- **Manual Processes**
  Complicated procedures increase the chance of error and give people incentive to ignore controls.
- **Globalization**
  Continuous "internationalization", but reporting tools are typically used locally in various departments and not governed centrally.
- **Data and Analytics**
  Regulators recognize the power in effective data analytics to help drive strong risk management and regulatory compliance, and have included it in their own supervision and enforcement processes.
- **Regulatory Pressures**
  Regulators expect more and use powerful analytical tools and practices to identify compliance-related risks.
- **Confusing Vendor-Landscape**
  In response to the explosion of vendors developing cutting-edge solutions, institutions struggle to identify suitable partners.

**Benefits:**
- Improved quality
- Performance-based modular cost structure
- Cheaper regulatory-based services
- Less complex compliance
- Enhanced efficiency
- Non-invasive implementations
- Lower cost of technology solutions
- End-to-end data management

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Building an effective compliance program that works in everyday life

Director, Compliance & Legal - Atea A/S
Palle Skaarup, sagkyndigt medlem KLFU
Bestikkelsessag kan give Atea milliardtab

Bagmændspolitiet har sigtet Atea for at medvirke til bestikkelse, behøver topchef Steinar Semslev (83). Endvidere med en mærke, kan det kaste Atea ordres for mellemandt huse offentlige kunder som Statens og Kommunernes Indkøbservice (GIK), der kan ophæve et kontraktbestemt bestikkelsesse.

Sådanne mellemandt huse offentlige kunder kan lede til at Atea-topchefen ikke også blive en bestikkelse.

Siden: 6-7

Hemmelig lydoptagelse lager press på Atea-chef

Tilfældet i Atea-sag klager at direktøren går fri

Opinion

EU bor se stort på Danmarks færdsel

Direktøren i Region Sjælland er fyret efter bestikkelsessag

Analystiker: Atea skal kæmpe for tilliden

1,2

26.790 kr. 2.500 kr. 40 millioner kr. konto 2840 kundenummer 123123

ATEA
Selfcleaning: Processes and updates

Identify & prioritise

compliance-risk

Update of all schemes for monitoring

Validation and reporting
Risk assessment: Probability and Consequence

- Risk assessment is made on the basis of a generally accepted method of risk assessment: assessment of probability and assessment of consequences

### Probability

<table>
<thead>
<tr>
<th>Consequence</th>
<th>Economy</th>
<th>Reputation</th>
<th>Corruption</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ingen konsekvens for økonomi</td>
<td>Ingen reaktion fra interessenter/dækning af medier</td>
<td>Ingen overtrædelse af gældende love og regler vedrørende korruption</td>
</tr>
<tr>
<td>2</td>
<td>Meget begrænset økonomisk konsekvens (op til 2,5 mio. kr.)</td>
<td>Meget begrænset reaktion fra interessenter/dækning i medier</td>
<td>Påtale uden væsentlig indflydelse</td>
</tr>
<tr>
<td>3</td>
<td>Begrænset økonomisk konsekvens (op til 15 mio.)</td>
<td>Kortvarig påvirkning af omdømme gennem interesse fra medier og interessenter</td>
<td>Enkeltstående og marginal overtrædelse</td>
</tr>
<tr>
<td>4</td>
<td>Bedens størrelse og omfang har betydelig konsekvens for Ateas økonomi (op til 30 mio. kr.)</td>
<td>Alvorlig konsekvens for omdømme: mediedækning og fokus fra interessenter i en periode</td>
<td>Overtrædelse af gældende lovgivning vedrørende korruption særligt ift. den private sektor</td>
</tr>
<tr>
<td>5</td>
<td>Bedens størrelse og omfang har meget alvorlige konsekvenser for Atea (op til 50 mio. kr. eller derover)</td>
<td>Meget alvorlige konsekvenser som er &quot;ude af kontrol&quot;: landsdækkende og vedvarende mediedækning og kritik fra interessenter</td>
<td>Overtrædelse af gældende lovgivning vedrørende korruption, særligt ift. den offentlige sektor samt private amerikanske selskaber</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Probability</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Risikoen indtræffer aldrig</td>
</tr>
<tr>
<td>2</td>
<td>Risikoen kan indtræffe en gang, når der er gået mere end 4 år</td>
</tr>
<tr>
<td>3</td>
<td>Risikoen kan indtræffe en gang inden for 2-4 år</td>
</tr>
<tr>
<td>4</td>
<td>Risikoen kan indtræffe en gang inden for det næste år</td>
</tr>
<tr>
<td>5</td>
<td>Risikoen vil indtræffe mindst en gang i kvartalet</td>
</tr>
</tbody>
</table>
### Summary of Compliance risks

<table>
<thead>
<tr>
<th>ID#</th>
<th>Kategori</th>
<th>Risikobeskrivelse - Der er en risiko for:</th>
<th>Hidtid (Sandsynlighed, Konsekvens)</th>
<th>Opdateret (Sandsynlighed, Konsekvens)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Rabatter</td>
<td>Kontantsalgsrabat/individuelle rabatter ydes for at opnå uberettigede fordele</td>
<td>5,4 3,4</td>
<td>3,4 2,4</td>
</tr>
<tr>
<td>B</td>
<td>Repræsentation</td>
<td>Manglende transparente vedrørende rejseafregninger</td>
<td>3,3 5,2</td>
<td>5,2 3,2</td>
</tr>
<tr>
<td>C</td>
<td>Tredjeparter</td>
<td>Tredjeparter yder en kunderepræsentation, som overskrider Ateas regler på området</td>
<td>2,3 5,2</td>
<td>5,2 3,2</td>
</tr>
<tr>
<td>D</td>
<td>Leverandør-arrangementer</td>
<td>Atea påvirkes ift. leverandørarrangementer</td>
<td>4,3 3,2</td>
<td>3,2 2,3</td>
</tr>
<tr>
<td>E</td>
<td>Offentlige udbud</td>
<td>Atea påvirker uberettiget udbudsproces</td>
<td>2,5 1,1</td>
<td>1,1 1,1</td>
</tr>
<tr>
<td>F</td>
<td>Demovare/udlån</td>
<td>Udlånsvarer anvendes til uberettiget at påvirke kunder</td>
<td>4,5 1,4</td>
<td>1,4 1,1</td>
</tr>
<tr>
<td>G</td>
<td>Demovare/lager</td>
<td>Varer fra demolager bliver gensolgt</td>
<td>4,5 4,3</td>
<td>4,3 3,2</td>
</tr>
<tr>
<td>H</td>
<td>Sponsorer</td>
<td>Ydelse af sponsorer som ikke er godkendt/restræd mod Ateas retningslinjer</td>
<td>2,3 1,2</td>
<td>1,2 1,1</td>
</tr>
<tr>
<td>I</td>
<td>Gaver</td>
<td>Der gives gaver, som strider mod gældende regler</td>
<td>3,5 2,4</td>
<td>2,4 1,1</td>
</tr>
<tr>
<td>J</td>
<td>Kundeoplysninger/udlandsrejser:</td>
<td>Arrangement af events, der strider mod Ateas regler</td>
<td>3,4 1,3</td>
<td>1,3 1,1</td>
</tr>
<tr>
<td>K</td>
<td>Kundeoplysninger/udlandsrejser:</td>
<td>Repræsentation på events/rejser overtræder Ateas regler</td>
<td>3,4 4,2</td>
<td>4,2 3,2</td>
</tr>
<tr>
<td>L</td>
<td>Donationer</td>
<td>Der gives donationer for uberettiget at påvirke en kundens beslutning</td>
<td>1,3 1,2</td>
<td>1,2 1,1</td>
</tr>
<tr>
<td>M</td>
<td>Ansættelsesprocedurer</td>
<td>Manglende kontrol af hvilke medarbejdere, der sættes</td>
<td>2,4 1,1</td>
<td>1,2 1,1</td>
</tr>
<tr>
<td>N</td>
<td>Konferencetale</td>
<td>Kunder aflønnes/smøres for at holde oplæg på en Atea-konference</td>
<td>1,2 1,1</td>
<td>1,1 1,1</td>
</tr>
<tr>
<td>O</td>
<td>Databehandling</td>
<td>Atea overholder ikke sin rolle som databehandler ift. sundhedsdata</td>
<td>Ny</td>
<td>Ny</td>
</tr>
<tr>
<td>P</td>
<td>Databehandling</td>
<td>Sikkerhedsbrist ift. sikker backup af kundedata</td>
<td>Ny</td>
<td>Ny</td>
</tr>
<tr>
<td>Q</td>
<td>Databehandling</td>
<td>Underdatabehandlede behandler ikke data sikkert</td>
<td>Ny</td>
<td>Ny</td>
</tr>
<tr>
<td>R</td>
<td>Svind</td>
<td>Kørselstilskud (Kilometer) udnyttes</td>
<td>Ny</td>
<td>Ny</td>
</tr>
<tr>
<td>S</td>
<td>Svind</td>
<td>Materialer og værkstøj forsvinder/bruges til egen vinding</td>
<td>Ny</td>
<td>Ny</td>
</tr>
<tr>
<td>T</td>
<td>Konkurrenceret</td>
<td>Manglende overholdelse af konkurrenceret</td>
<td>Ny</td>
<td>Ny</td>
</tr>
</tbody>
</table>

**Note:** Tabellen angiver først vurderingen/score for Sandsynlighed (S) og efter kommaet angives vurderingen/score for Konsekvens (K).
Customer-events/traveling abroad: behavior

• C: Repræsentation på events/rejser overtræder Ateas regler

1. Risk - description

Der er en risiko for, at der foretages repræsentation på kundeevents/kunderejser, der strider mod Ateas regler:

• Risikoen kunne bestå i, at ansatte udviser en adfærd, hvor man f.eks. har en exorbitant repræsentation over for en kunde i strid med Ateas regler.

2. Reasons why a risk can occur

• Manglende awareness hos medarbejderne ift. gældende regler og procedurer på området
• At udgifter forsøges "gemt" i udgiftsbilag til repræsentationer/rejser

3. Probability

• Risikoen vurderes at have en høj sandsynlighed (i lighed med Risiko B vedrørende rejseafregninger). Den høje sandsynlighed skal dog ikke forveksles med en høj sandsynlighed for snyd/misbrug, men er i stedet et udtryk for, at der foretages repræsentation, og at der kan opstå fejl og mangler i dokumentation for denne repræsentation på grund af sjusk.

4. Consequence

• Konsekvensen vurderes begrænset, idet Atea foretager opfølgning på, hvad der bruges på events/rejser samt har klare retningslinjer for Ateas repræsentation ift. kunder. Det er således også vurderingen, at et eventuelt brud på reglerne ikke kan anses for systemisk, men vil være resultatet af, at en medarbejder handler i ond tro for egen vindings skyld.

5. Monitoring effort (key elements)

• Der henvises til de beskrevne monitoringsindsatser vedrørende Risiko B: repræsentation
• Der foretages endvidere kontrol af forbrug i forbindelse med de enkelte events, f.eks. for at kontrollere om udgifter stikker ud/afviger betydeligt, f.eks. forbrug i forbindelse med Microsoft Ignite eller Cisco Live-konferencerne.

Kilde(r): Compliance
Monitoring and control

Monitoring is performed using the process illustrated below, where the Compliance Office, Finance and Top Management collaborate to find and address all deviations from Atea’s rules and regulations.

- Compliance Office: Selects samples using a risk-based approach
- Finance: Examines and documents all samples
- Compliance Office: Writes summary reports to Top Management
- Top Management: Handles any deviations from Atea’s rules and regulations
Annual circle

- 18 different identified risk areas are monitored throughout the year
- Samples from each risk area are collected and controlled 1-4 times per year based on a pre-defined schedule
- Annual evaluation of each risk areas
- Evaluation of risk areas if larger changes in the organizations environment
## Monitoring

### INDSATS-/RISIKOMRÅDE 3: Repræsentation

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bilag C2</strong></td>
<td>Konkret gennemgang af de enkelte sager</td>
<td><strong>Gennemgang af foretagen repræsentation (Antal: x)</strong></td>
<td><strong>Tidspunkter herfor</strong></td>
</tr>
<tr>
<td><strong>Repræsentation X</strong></td>
<td>Hvert kvartal (den 1)</td>
<td>1) Indsøgning af listen fra ekonomiudvalg vdr. relevante kontonummer.</td>
<td>CCO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2) Foreligger behørig dokumentation i hvert enkelte tilfælde?</td>
<td>Økonomiudvalg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3) <strong>Hvad</strong> uenoverstemmelser. Lista leves</td>
<td>Økonomiudvalg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4) Direkte rapportering fra CCO =&gt; CEO og CFO</td>
<td>CCO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5) Evt. personalmæssige (vurderes det som en forgivnelse eller som en bevidst handling)</td>
<td>CEO/HR direktør</td>
</tr>
</tbody>
</table>

- **Intelligent extraction of samples for monitoring.**
  - CCO takes out special topics of interest
    - Departments, Specific customers, individuals or other topics of interest
    - E.g on basis of Spend analysis etc.
  - The rest of the samples are taken from a randomness principles of our Finance Dept.
ISO 37001:2016
Anti-bribery Management System
ISO 37001 has 230 impact points:

- **Context of the organization**
  - Understanding the organization and its context
  - Understanding the needs and expectations of stakeholders
  - Determining the scope of the anti-bribery management system
  - Anti-bribery management system
  - Bribery risk assessment

- **Leadership**
  - Leadership and commitment
  - Anti-bribery policy
  - Organizational roles, responsibilities and authorities

- **Planning**
  - Actions to address risks and opportunities
  - Anti-bribery objectives and planning to achieve them

- **Support**
  - Resources
  - Competence
  - Documented information

- **Operation**
  - Operational planning and control
  - Due diligence
  - Financial controls
  - Non-financial controls
  - Implementation of anti-bribery controls by controlled organizations and by business associates
  - Anti-bribery commitments
  - Gifts, hospitality, donations and similar benefits
  - Managing inadequacy of anti-bribery controls
  - Raising concerns
  - Investigating and dealing with bribery

- **Performance evaluation**
  - Monitoring, measurement, analysis and evaluation
  - Internal audit
  - Management review
  - Review by anti-bribery compliance function

- **Improvement**
  - Nonconformity and corrective action
  - Continual improvement
Ethic rules that are complied with and widely accepted
Intranet site ensures knowledge of compliance to employees and answers questions related to compliance.
Customer gifts – what, how, when, why?
4.8 Regulatory conditions, Atea’s Code of Conduct and Atea’s Policies for Presents, Representation, Travels, Customer events and Sponsorships applicable in Denmark

The Supplier is obliged to comply with all current rules and regulations, including rules and regulations associated with import/export regulation, environmental and criminal codes.

The Supplier is obliged to comply with current laws and standards regarding corruption, and to implement necessary routines to avoid any form of bribe or corruption.

The Supplier shall also follow ethical requirements for the trade. Atea is committed to work actively to promote CSR. Atea respects the fundamental requirements of CSR, as encompassed in Atea’s and the Atea Group’s CSR policy and programmes applicable from time to time, available at http://www.atea.com/greenit. Atea incorporates CSR in its activities related to the Framework Agreement.

The Supplier undertakes to comply with and not to initiate any activities violating Atea’s Code of Conduct set out in Appendix 3 and Atea’s Policies for Presents, Representation, Travels, Customer events and Sponsorships applicable in Denmark set out in Appendix 4 as amended from time to time.

The Supplier undertakes to that all sub-suppliers used will meet the requirements specified in this clause.

In the event of the Supplier’s breach of this Clause 4.8, the Supplier shall be liable to pay a penalty of an amount determined by Atea at Atea’s reasonable discretion. The penalty can, however, never exceed DKK 1,000,000 per breach, unless the breach is a result of fraud or willful or reckless misconduct.

In the event of and all manner of prize awarding and sale competitions shall be approved by Atea’s Category Manager.

Any issuing of non-approved prize awardings to any employees of Atea and any issuing of non-approved sale competitions to any department of Atea shall be considered as a breach under this Agreement. In the event of such breach, the Supplier shall be liable to pay a penalty for DKK 10,000 per breach.
SUPPLIER CODE OF CONDUCT

“Atea believes that information technology, combined with knowledge and creativity, can transform productivity and living standards across society. To fully realize our mission, it’s not enough for Atea to offer world-class IT solutions. We must ensure the long term sustainability of our business.” Steinar Sensetby, CEO

Atea is committed to sourcing from suppliers who share its business ethics and principles, and apply them throughout their supply chain. Atea’s Code of Conduct, based inter alia on the UN Global Compact, states that Atea’s suppliers shall deliver goods and services to Atea that are produced in accordance with the Electronics Industry Citizenship Coalition Guidelines.

This Supplier Code of Conduct intends to set concrete expectations of Atea’s core businesses and in turn of their contractors, sub-suppliers and other business associates at any level in the supply chain.

Supplier Code of Conduct

This Code is not meant to be exhaustive and there may be situations where it does not provide explicit guidance. We expect all suppliers to always comply with applicable laws and regulations and to exercise good judgement consistent with the business ethics promoted in this document.

Atea expects all its suppliers to progressively commit to implement the EICC Code of Conduct (hereafter “EICC Code”) or an equivalent code. The EICC Code establishes standards to ensure that working conditions in the electronics supply chain are safe, that workers are treated with respect and dignity and that business operations are environmentally responsible and conducted ethically. The EICC Code is intended to be a whole of supply chain initiative and involves, but is not limited to:

- Monitoring suppliers to uncover risks of and remediate non-compliance against the EICC Code.
- Work proactively to ensure that the EICC Code is followed by their own contractors, sub-suppliers and other business associates at any level in the supply chain.
- Ensuring that management, monitoring and tracking processes are in place to ensure continuous performance improvement throughout their supply chain, not least through capacity building initiatives and continuous dialogue with suppliers.

Atea will also seek and favor suppliers who:

- Work to raise workers living standards, for example through improved wage systems, benefits, welfare programs, reduction of working hours and any other activities that exceed legal requirements.
- Work to ensure and demonstrate that the EICC standards are applied to all workers, whether permanent, temporary, migrant, student, contract, direct or indirect employees.
- Demonstrate how they and their suppliers exercise due diligence on the supply of minerals whose sourcing could be linked to human rights violations and to direct or indirect support to armed conflict minerals, in line with the OECD guidelines or other equivalent guidelines.
- Use the EICC Code and sustainability criteria to drive business relationships with their suppliers.

Compliance and Collaboration

Atea expects its suppliers to commit to and actively pursue conformance with the EICC Code or an equivalent.

Atea expects its suppliers to share timely information and underlying documentation that will facilitate Atea’s monitoring of such commitment. This includes all relevant information relating significant risks of non-conformance with the specific provisions set forth in the EICC Code, by either the suppliers or their sub-suppliers.

Atea will monitor how suppliers and sub-suppliers, at any level within the supply chain live up to the expectations set out in this document. Atea will conduct systematic risk-based supply chain monitoring by various means. This will include but not be limited to self-assessments, information sharing agreements with priority suppliers, participation in industry audits, site visits and specific collaboration initiatives with suppliers and sub-suppliers, aimed at addressing priority issues.

For full details of the EICC Code: 
[link]

CONTACT US: we believe there are many locally knowledgeable organisations that can help us understand the risks and dynamics in our supply chain. If you would like to share information with us about our supply chain, please contact us at: responsible sourcing@atea.no. The information provided will be treated confidentially.
Confidence and trust

Compliance lives within the organization

ISO 37001 certification and selfcleaning
Global reach

Approximately 76,000 employees in more than 130 countries:

• Deeper customer understanding
• Presence facilitates expansion
• Greater negotiating power
• Opportunities for shared services
• Access to highly skilled labour
OUR BUSINESS

Connecting and simplifying global supply chains

A.P. Moller - Maersk enables its customers to trade and grow by transporting goods anywhere.

Maersk works to provide customers with a simple end-to-end offering of products and services, seamless customer engagement and a superior end-to-end delivery network, taking the complexity out of global supply chains.
Going from Group function to be a Global function

- Group function - 2nd line of defense
- Setting policies (as approved by Management and Audit Committee) and guidelines (BU/Functions responsible for implementation, anchored with local CFO)
- Group function to validate based on “submission” from BU/Functions (half yearly)
- Group Function to report to Management and Audit Committee

- Global function - 2nd line of defense
- Setting policies (as approved by Management and Audit Committee) and guidelines.
- Drive implementation and standardization across Maersk
- Validation is standardize, performed globally and reported to Management and Audit Committee
Recommendation

- Upgrade the risk assessment process to consider brand specific risks and ensure **uniform scoping** across brands.
- Move to a **consistent** risk based validation testing across Maersk.
- **Replace** maturity **rating model** by a model based on risk mitigation and control effectiveness.
- Activate the first line of defense by setting purpose, clear roles and responsibilities and training.
- Promote independence of the GRC teams by empowering Maersk GRC in the performance evaluation process.
- Expand the scope of GRC and build an integrated risk framework for Maersk including **IT controls**, compliance, etc.
- Invest in control optimization (robotics, control automation, data analytics and **GRC tooling**).
Assessment of the status on Financial Reporting Control environment in Maersk and What to do next

Before

• The control framework (from 2010) has been created to support the former conglomerate – facilitating a minimum acceptable level of assurance around the Financial Reporting, leaving the responsibility of the underlying processes to the BU’s.
• Not including was the quality of the underlying processes and the nature of controls has not been addressed. E.g. a lot of manual controls has been implemented, among others, due to KPI for control compliance.
• The level of manual controls has also been a “driver” in increasing the total control score (calculated as a simple average of all controls per risk element).
• In addition the nature of the framework have been an element for a decreasing accountability in 1st line of defence and to some extent missing ownership of risks and of control performance.

Today

• As we are moving towards One Maersk we are also looking at how we defining, developing and assessing our internal controls and we have implemented a revised approach by January 2019.
• Key improvements will be;
  • Focus on Critical Financial Statement Accounts and main IT Applications,
  • Clear focus on Internal Controls over Financial Reporting,
  • Top down risk assessment – One Maersk, aligned with functions and process owners
  • Controls categorized as entity (new) or process or ITGC and
  • Controls defined as Critical/key/non key
  • Assessment either effective or ineffective (both on design quality and operational performance)
• Financial Reporting – Critical risks (controls) will be reported to AC in an agreed form

Move financial control framework to less Quantity and more Quality
The "new" Governance, Risk and Controls function (GRC)

GRC is responsible for the ongoing monitoring of the design and operation of controls implemented by the first line of defense, as well as advising on and facilitating risk management activities.

➢ We will; set policy and provide guidelines, facilitate risk assessment, provide self-assessment and monitoring tool (GRC tool), sign off/validate control design, perform control monitoring/testing/validation, assess status of control environment and report to management/Audit Committee

➢ We will; provide training/learning and be a task force for issue/finding solving

➢ We will; be a knowledge base for; Control design, Automation of controls, Data analytics, ITCG controls and Process design

➢ We will; facilitate the Issue management (Issue tracker) and do a structured follow up on PWC findings and GIA findings.
How a GRC tool implementation has supported that journey
Inconsistency in monitoring process and interpretation of how rating impact.

More assurance of standardization of the monitoring process and rating impact.

Manual activities on follow-up, assessment and data used reporting purposes due to information and data in various databases and excel templates.

A tool facilitating all of the internal control activities within the year and automated actual ratings available.
RSA Archer - Project Journey

Jan-Dec 2017
- Vendor selection
- Vendor sign off

Jan-Aug 2018
- Project execution
- Design
- Testing
- Implementation

Sep 2018
- Go live

Oct-Dec 2018
- Hypercare
- Enhancement

2019→
- GRC cycle
- Risk assessment
- Issue management
- Monitoring
- Reporting

Aligning of a common platform for handling controls including tool selection (as a joint project for the GRC teams)

Co-developing of GRC tool (RSA Archer)
- Standardizing definitions
- Aligning frequencies, processes, scoping and assessments

Fully alive end 2018 for core brands including global templates (and ready for new framework roll out in 2019)
How finance compliance can support other compliance functions

- We come with:

  - SOD design and controls
  - Master Data management (e.g. Bank account update, Costumer and Vendor Master data update)
  - Authority Matrix compliance

  - Transaction in USD for selected activities
  - Master Data management (Costumer and Vendor Master data update)
  - Country, prohibited goods screening

  - KYC process during customer creation

Value to "other" compliance functions
Thank you.
Towards Next generation Audit Analytics
United Nations Office for Project Services

Compliance Agenda 2019
19 Nov 2019
Overview

1. Why we are investing in Data Analytics
2. IAIG Data Analytics/Continuous Audit Testing (CAT) Approach & Results
3. Whats next?
Large Organizations = Massive Data Sets

- 196,000+ vendors
- 10,000+ personnel
- 100+ bank a/c’s in 50+ currencies
- 200K payments annually
- $2.0 billion p.a disbursement
- Several million records (payroll, invoices, contracts)

Printed out: Document stack 9 times as tall as Freedom Tower

120 GB of data
Audit Procedures

Traditional vs Smarter

Disbursements Data

- Phony vendor
- Ghost employee
- Suspicious transaction
- Internal Audit Projects

Disbursements Data

- Phony vendor
- Ghost employee
- Suspicious transaction
- CAT
1-Investment in Data Analytics

Evolution

Excel → CAATS → Scripts → CCM
Financial Crime Analytics Framework. Multiple techniques with multiple purposes

**Business Rules**
- Scenario development
- Rule generation
- Enactment
- Alert generation
- Risk score models
- Exception testing

**Explorative Analysis**
- Profiling with statistics
- Execution of offline exploratory analyses to detect risks and trends and to initiate an improvement loop
- Spot checks
- Visualization
- Cross-data source analysis (manual)
- Cluster analysis

**Profile Analytics**
- Statistical and automated comparison of current transactional behavior against expected, common or unusual behavior
- Monitoring against expected profiles
- Customer level monitoring
- Social Network Analysis

**Predictive Modelling**
- Self learning risk classification techniques to identify transactions or events with a high financial crime risk in a data-driven way
- Predictive analytics to reduce false positives and find new risks
- Monitoring transaction networks

**Reporting**
- Structured and detailed reporting on detection activities and risks mitigated to inform stakeholders

**RESULT**
- Risk based approach to detect well known financial crime patterns
- Periodic assessment of undetected financial crime patterns
- Continuous monitoring for unexpected, uncommon or unusual behavior that could be indicative for fraud
- Addition to risk based approach, to detect complex financial crime patterns

*Hybrid approach – Orchestrated combination of multiple techniques*
1-Integrating Data Analytics to traditional audit process

Traditional audit steps
- Confirm audit objectives/scope
- Develop enhanced audit scope
- Audit commences
- Test key hypothesis
- Communicate results

Integrated data analytic steps
- Identify potential analytics
- Extract, transform, and load data
- Analyze data; compare, profile, visualize
- Brainstorm with audit team and develop testing hypothesis
- Audit sampling, continue to support and iterate on hypothesis
- Visualize and story board results

1. Perform the same audit faster
2. Perform the same audit cheaper
3. Perform better audits
4. Make Innovation a centerpiece
3-Implementation of Data Analytic/CAT

- Resources
- Mapping
- Process
- Data Integrity
- Tests
- Dashboards

Engagement/Project data aggregation
9/33 - Top 30 Overspent Projects

1.6.1 Development of CAT

- Active
- Juste
- by Muhammad Hassa...
- on 08 Jun

- Completed 01-Establish aim of test (narrative) 23 Jun
- Completed 02-Establish Gap 27 Jul
- Completed 03-Map relationship of tables 11 Aug
- Completed 04-Review and verification 14 Jul
- 05-Finalize reviewed SQL commands 21 Aug
## UNOPS – DATA ANALYTICS & CONTINUOUS AUDITING

### 3-Implementation of Data Analytic/CAT

<table>
<thead>
<tr>
<th>Resources</th>
<th>Mapping</th>
<th>Process</th>
<th>Data Integrity</th>
<th>Tests</th>
<th>Dashboards</th>
</tr>
</thead>
</table>

#### AIPDETAIL & AIPDETAILS TABLES – PAYMENT
- **AIPDETAIL TABLE – PURCHASE ORDER**
  - **spac_id**: Supplier ID
  - **client**: Company code
  - **country_code**: Country code
  - **currency**: Currency code
  - **description**: Description
  - **date_due**: Due date
  - **issue_date**: External invoice reference
  - **line_seq**: Payment sequence number within payment_id
  - **line_status**: Line status (L, S, M, A, B, E)
  - **order_id**: Order number
  - **pay_currency**: Payment currency
  - **pay_method**: Payment method
  - **pay_method_code**: Pay method code
  - **paymethod_date**: Payment date
  - **paymethod_id**: Payment identifier
  - **period**: Period
  - **rem_amount**: Remittance amount
  - **rem_cur**: Remittance currency code
  - **rem_line_no**: Remittance number
  - **sequence_no**: Sequence number
  - **voucherno**: Voucher number

- **AIPDETAILS TABLE – PURCHASE ORDER**
  - Similar to AIPDETAIL but with additional fields

#### AIPDETAILS & AIPDETAILS TABLES – PAYMENT
- **ALGDELIVERY TABLE – RECEIPT**
  - **spac_id**: Supplier ID
  - **client**: Company code
  - **date_del**: Delivery date
  - **order_id**: Order number
  - **real_amount**: Involved amount in local currency by exchange rate from general ledger

#### ASUTRANS & ASUHISTR TABLES – PAY TO SUPPLIER
- **ASUTRANS TABLE**
  - **spac_id**: Supplier ID
  - **arrival_date**: Date when the invoice was received (Invoice date?)
  - **amount**: Amount in local currency

- **ASUHISTR TABLE**
  - **client**: Company code
  - **compliant**: Compliant code
  - **cur_amount**: Amount in transaction currency
  - **legal_status**: Legal action status
  - **order_id**: Order number
  - **voucherno**: Voucher number
3-Implementation of Data Analytic/CAT

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</tr>
</thead>
</table>

![Diagram showing the implementation process]
3-Implementation of Data Analytic/CAT

Raw to Smart Structured data & Elimination of Bad Data
3-Implementation of Data Analytic/CAT

**Resources**

- Over-due Project closures
- PO Splitting
- Approval beyond DoA
- Payments to Sanctioned Vendors
- Duplicate Vendors

**Mapping**

**Process**

**Data Integrity**

**Tests**

- Control Tests
  - Transaction Anomalies
  - Vendor Anomalies
  - Benford’s Law
  - Deactivated Vendors with Single Payments
  - Duplicate payments

**Dashboards**
Tabular Dashboard:
- Top 30 payments (by USD)
- Top 30 vendors (by USD)
- Top 30 vendors (by Transaction count)
- Top 10 overspent engagements

Analytical Dashboard:
- Procurement
- Accounts Payable
- Engagements & Projects
- HR & Contracting
## 4-Results

### Table: Continuous Audit Testing-Highlight of Issue

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Issue</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Duplicate/Over Payments</td>
<td>$58,482</td>
</tr>
<tr>
<td>2</td>
<td>Transactions with UNGM Sanctioned Vendors</td>
<td>$311,188</td>
</tr>
<tr>
<td>3</td>
<td>Vendor Anomalies</td>
<td>9,586</td>
</tr>
<tr>
<td></td>
<td>Active vendors have a duplicate bank account (same vendor and same bank account) i.e. these are duplicate vendors.</td>
<td>1,664</td>
</tr>
<tr>
<td></td>
<td>Vendor duplicates by [Name (fuzzy) + Country]</td>
<td>1,496</td>
</tr>
<tr>
<td></td>
<td>Vendor duplicates by [Bank Account + Country]</td>
<td>188</td>
</tr>
<tr>
<td></td>
<td>Vendor duplicates by [eMail]</td>
<td>695</td>
</tr>
<tr>
<td></td>
<td>Vendor duplicates by [Telephone + Country]</td>
<td>1,161</td>
</tr>
<tr>
<td></td>
<td>Vendor duplicates by [Address (fuzzy) + Country]</td>
<td>4,382</td>
</tr>
<tr>
<td>4</td>
<td>Employees'/personnel duplicates</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td>There are 173 duplicates by [Name + Birthdate + Country]</td>
<td>173</td>
</tr>
<tr>
<td></td>
<td>There are 44 duplicates by [Bank Account + Country]</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>There are 583 duplicates by [eMail] and [telephone]</td>
<td>583</td>
</tr>
<tr>
<td>5</td>
<td>Employees'/personnel banking details matching with vendor &quot;company&quot; banking details</td>
<td>17</td>
</tr>
</tbody>
</table>
What is next – and how do we innovate ourselves?
Audit Analytics (Ad-hoc) → Continuous Auditing → ?
What is NEXT for UNOPS IAG?

Innovate the way we work and the way we create results

Better platform for auditors to interact and work with as well integrate closer with the business

Make an impact in the organization and increase the maturity within Risks, Controls and Monitoring
UNOPS – TOWARDS NEXT GENERATION AUDIT ANALYTICS

Why?

Advances in technology generates new possibilities

More data to connect and learn from

More precise outputs and identification of new patterns

Catalyst for change and impact in UNOPS

Better user-experience across the organization
What are we doing?

Data exploration using Machine Learning
- Google BigQuery
- Unsupervised Machine Learning Algorithms

Migrating legacy technologies to Cloud platform

Developing a state of the art Audit platform on open source technologies
- Modern User-interface
- Capture and document feedback on exceptions
How will it look like?

Navigation

Exception / Redflag

Feedback
UNOPS – TOWARDS NEXT GENERATION AUDIT ANALYTICS

Explorative Analytics with Machine Learning

Feed rules with new insights

Rule-based Audit Analytics procedures

Prepare for switch over
Lessons learned

Involve the “Customer” in the full process
Involve all stakeholders and users from the very beginning

IT to be involved from the very beginning
Save time and drawbacks in the planning and project phases and align with IT and plans.

New ways of working requires change management
Applying new techniques and ways of working always requires change management and communication

New Technology can bring new insights
Think about how these insights are integrated best in the work, in the organization and in the solutions

Invest in resources & skills
Diverse skillsets are needed if you want to succeed with Data & Analytics. Skills to be maintained on all levels and across capabilities.
Thank You
Technology Trends
In Compliance

19-11-2019
Introduction

Daniel Jørgensen
Director, Risk Advisory

Risk Technology
- GRC implementations
- AI & Machine Learning PoC’s & implementations
- Automation of tasks, controls and processes
- AI & Automation Risk & Controls
Technology Trends
In Compliance
The Compliance Landscape

Compliance and regulatory change functions have not fully evolved to organizational challenges or external pressures and need to become more efficient to meet future demands.

**Enterprise Technology**
Adoption of Cloud Technology, digitalization of core processes and focus on automation and efficiency.

**Big Data & Analytics**
Increased use of unstructured, high volume data to drive risk identification and process enhancement.

**RegTech**
Cognitive compliance; use of a fully integrated GRC Tool; enhanced identification of emerging risks through risk sensing.

**Internal Challenges**
- Lack of **executive leadership buy-in**
- Fragmented regulatory and compliance **change management**
- Lack of compliance risk management **strategic vision**
- Lack of clarity and **engagement with front line units**
- **Resource/staffing** challenges
- Weak **governance** and oversight
- **Ineffective coordination** across multiple jurisdictions
- Disparate **risk methodologies**

**Regulatory & Industry Pressures**
- **Heightened standards** and expectations given size and complexity of operations/services
- Increased regulatory **examination and inspections (multiple regulators)**
- Increasing **enforcement actions and/or fines** and penalties
- New **regulatory requirements**
- Multiple jurisdictions with complex or conflicting **laws/regulations**
- Evolution of industry leading practices necessitating change

Organizations should utilize the four operating model pillars to drive towards a modernized function:
Technology Trends in the Compliance Landscape

- Analytics
- Automation
- AI & Machine Learning
- Integrated GRC
- Cloud
- BlockChain
“Analytics is not new to compliance functions…”

Majority of compliance functions

<table>
<thead>
<tr>
<th>Decisions</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESCRIPTIVE ANALYTICS</td>
<td>What happened?</td>
</tr>
<tr>
<td>DIAGNOSTIC ANALYTICS</td>
<td>Why did it happen?</td>
</tr>
<tr>
<td>PREDICTIVE ANALYTICS</td>
<td>What will happen?</td>
</tr>
<tr>
<td>PREScriptive ANALYTICS</td>
<td>How can we make it happen?</td>
</tr>
</tbody>
</table>

Examples

Descriptive
- KPI/KRI
- Patterns & Trends
- Operational Controls

Diagnostic
- Root-cause
- Incidents & Opportunities
- Fraud and Security Breaches

Predictive
- Planning & Forecasting
- Risk and Stress Testing
- Customer Behavior

Prescriptive
- Sales & Marketing Strategies
- Operating Strategies
- Risk & Compliance Strategies

Artificial Intelligence
- Complaint Text Mining
- Fraud detection
Analyzing End-to-End Processes with Process Mining

- Core insights
- Full transparency
- Digital footprints
- IT-based process
- Process
Process flows constructed visually
Analyzing End-to-End Processes with Process Mining

Purchase-to-Pay Analysis

<table>
<thead>
<tr>
<th>Purchase Order Items</th>
<th>Net Order Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>289k</td>
<td>651M</td>
</tr>
</tbody>
</table>

Purchase Orders by Country

<table>
<thead>
<tr>
<th>Country</th>
<th>#PO Items</th>
<th>AT</th>
<th>Net Order Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>172,113</td>
<td>€5</td>
<td>943,395,765</td>
</tr>
<tr>
<td>France</td>
<td>71,745</td>
<td>€5</td>
<td>917,833,974</td>
</tr>
<tr>
<td>Belgium</td>
<td>14,274</td>
<td>€5</td>
<td>43,781,915</td>
</tr>
<tr>
<td>Italy</td>
<td>10,917</td>
<td>€5</td>
<td>6,656,575</td>
</tr>
<tr>
<td>Spain</td>
<td>10,845</td>
<td>€5</td>
<td>6,505,720</td>
</tr>
<tr>
<td>Switzerland</td>
<td>2,256</td>
<td>€5</td>
<td>6,515,833</td>
</tr>
<tr>
<td>Portugal</td>
<td>1,403</td>
<td>€5</td>
<td>1,905,179</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1,180</td>
<td>€5</td>
<td>12,771,673</td>
</tr>
<tr>
<td>Colombia</td>
<td>470</td>
<td>€5</td>
<td>190,995</td>
</tr>
<tr>
<td>India</td>
<td>425</td>
<td>€5</td>
<td>1,366,015</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>362</td>
<td>€5</td>
<td>153,907</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>159</td>
<td>€5</td>
<td>6,676</td>
</tr>
<tr>
<td>Brazil</td>
<td>109</td>
<td>€5</td>
<td>370,085</td>
</tr>
<tr>
<td>Mexico</td>
<td>166</td>
<td>€5</td>
<td>39,963</td>
</tr>
<tr>
<td>Japan</td>
<td>101</td>
<td>€5</td>
<td>411,294</td>
</tr>
</tbody>
</table>

Top Country

- Germany
- France
- Belgium
- Italy
- Spain
- Others

Graph showing PQ items and volume over time.
Automation

**Cost Reduction**
Cost reduction net 30% - 60% per automated process

**Speed Increase**
Turn-around-time decrease (up to 80%)

**Quality**
Increase quality by avoiding human errors and focusing on exceptions

**Internal Control**
Avoiding human fraud, easily performed Control & Compliance checks

**Scalability**
Capacity can be increased - without long build-up phase

**Short Payback Period**
RPA implementation costs are paid off in < 12 months

**Valuable Work**
Employees do not waste any capacity for routine tasks

**24/7 Operations**
Non-stop performance - no queues at peak

**24/7 Operations**
Non-stop performance - no queues at peak
Automation

LEVEL 1  Good process design
LEVEL 2  Basic Automation
LEVEL 3  Intelligent Automation
LEVEL 4  Cognitive Automation

Example use-cases:
- Documentation
- Process Enhancements
- Controls testing
- Cognitive Intelligence
- Sampling / Coverage
- Contracts / Policy Inventory
- Data Extraction
- Contracts Review
- Review preparation

Example use-cases:
AI & Machine Learning

Knowledge representation & reasoning

Planning & scheduling

Machine learning

Computer vision

Speech recognition

Natural language processing

Robotics

Natural language generation
AI & Machine Learning

- Outlier & Anomaly detection
- Text Mining of Contracts
- Text Mining of Regulatory requirements & Policies
AI & Machine Learning

Outlier & Anomaly detection

Clustering with kMeans

Tree-based Models

Neural Networks
AI & Machine Learning

Text Mining with Dark Data

Contracts
- Timeframes
- Liability Clauses
- Penalty clauses
- DPA clauses
- Pricing
- Requirements

Regulations & Policies
- Local Requirements
- Penalty
- Policies & mapping to requirements, controls etc.
- Change impact analysis
Are Compliance functions adopting Technology at the same pace as the rest of the organization?
What are the biggest obstacles to get started or advance further?
Questions?
Thank you!
Regulatory technology to keep track of the ever-expanding universe of laws and regulations

How do we improve legal and regulatory oversight, keeping up-to-date on the daily changing landscape and take a strategic approach?

For who
Companies who are heavily regulated and are facing legal and regulatory requirements across geographies.

The Challenge
1. Companies are faced with **rising supervisory expectations**, reflecting the growth of principle-based supervisory approaches.
2. **Cost of compliance** for financial companies is expected to rise to 10% of total revenue by 2022.
3. We are moving away from global policy making and towards **regulatory divergence**, including geographical and activity-based ring-fencing.

Our solution

**Sensing**
RegMiner monitors over 160 legal and regulatory sources to ensure that your library is always up-to-date.

You only see laws and regulations that are relevant to you.

**Mining**
Quick and smart insight into the connections between laws and regulations, with the use of references, suggestions and topic searching within RegMiner’s library.

**Enriching**
Enabling social collaboration by allowing teams to interact and share information, enhancing legal and regulatory oversight.
Work together to take on complex regulations
With RegMiner it is easy to collaborate across your organisation. Leave notes on relevant articles, discuss regulations and work together to create checklists. This way you can build on the knowledge of your organisation.

The easiest way to find what you are looking for
One place to search through your entire library to quickly find the answers to your question. This enables you to easily explore regulatory topics and assess their level of impact.

All relevant policies, laws and regulations. Always available.
An always up-to-date library that brings together laws and regulations from multiple sources. The library is tailored to your organisation, only showing you relevant content.

Explore how laws and regulations are connected
Explore the relations between laws, regulations and even internal policies and automatically see content that is related to your topic of interest.
**Take control of your legal and regulatory oversight agenda**

Building value on top of an extensive and solid legal and regulatory foundation

---

**Example relevant regulatory topic use cases**

- **Definition or origination**
  - Curated regulatory requirements checklist
  - Always up-to-date

- **Definition of collateral**
  - Curated regulatory requirements checklist
  - Always up-to-date

- **Definition of default**
  - Curated regulatory requirements checklist
  - Always up-to-date

---

**RegMiner Foundation**

- **Checklists**
  - Checklists for each of your use cases with only relevant requirements for your specific purpose.

- **Topics**
  - Regulations are organised, for example, by credit-, market-, operational risk and many others – which allows you to see interdependencies and make the connection and between them.

- **Clusters**
  - Clusters consist of laws and regulations initiatives. RegMiner organises over 10,000 publications in clusters, making it easier to have a comprehensive oversight of the relevant topics.

- **Search**
  - Explore regulatory topics to quickly find relevant sections in your library.

- **Library**
  - Comprehensive and extensive set of laws and regulations based on your products, services and geographic focus.

- **Deloitte Risk Expertise**
  - Deloitte legal and regulatory experts provide you with a comprehensive insight into the requirements for the relevant topics.

---

**More legal and regulatory use cases**

The RegMiner legal and regulatory foundation enables you to be in control of your regulatory oversight agenda. One place to find, organize and share legal and regulatory knowledge in your organisation.
Building value on top of the best legal and regulatory foundation

- **Your use cases**
- **Checklists**
  To store the legal and regulatory requirements
- **Search and references**
  Find relevant articles in your tailored library and see the connections
- **Legal and regulatory clusters**
  Clusters consist of initiatives in regards to laws and regulations. RegMiner organises over 10,000 publications in clusters, making it easier to have a comprehensive oversight of the relevant topics.
- **Enriched legal and regulatory publications**
  With business topics like credit-, market- and operational risk
- **Legal and regulatory publications**
  Tailored to your jurisdictions, products and services
Building value on top of the best legal and regulatory foundation

**Dirard Mikdad**
RegMiner business owner
Dirard is a Director at Deloitte Netherlands’ Risk Advisory Practice. He is the business owner and responsible for the go-to-market of RegMiner. In his career, Dirard obtained extensive knowledge in various (Quantitative) Risk Management areas such as Credit, Liquidity and Market Risk Management and led various Risk and Finance Regulatory Change Programs. Dirard held various roles at Rabobank between 2008 and 2016, amongst others Head of Credit Risk Modelling. He has a strong focus on building successful teams.

**Anne Kathrine W. Holm**
Head of Innovation and Tech Solutions
Anne Kathrine is Head of Innovation and Tech solutions in Risk Advisory, Deloitte DK and Innovation Leader in Deloitte North South Europe. Anne Kathrine is a trained lawyer specialized in Intellectual property, technology and compliance. With an additional background as Nordic Compliance Manager and with 13 years of experience working with technology, Anne Kathrine operates at the interface between law and technology. Anne Kathrine is co-steering “Deloitte aiStudio” - a tech development hub in Frankfurt developing Risk Management solutions using AI and big data.

**Tony Johansen**
Head of Regulatory Risk
Tony is a Director at Risk Advisory, Deloitte Denmark. He is a Risk manager professional with more than 10 years of leadership experience from the financial sector – among other things heading a risk management unit in a large international bank. He is a broad experienced and skilled lead and project manager, especially experienced in translating regulatory topics into practical and structured solutions with a strong focus on business implementation and utilization of new technologies. Tony has more than 20 years of in-depth experience working with risk in the banking industry.
Deloitte TextMiner

An increase in the number of customers demanding text mining solutions has led to the development of the Deloitte TextMiner

- MDAX listed German insurance company
- DAX listed client from the German automotive industry
- Large client from the pharmaceutical industry
- German Defense industry client
- Large London based Insurance

*Speed depends on computational resources; using a high performance computer can significantly reduce processing time per document
Why choose the Deloitte TextMiner

Customized Text-Mining solution
While we offer the integration of various text-mining solutions, the best results are achieved by adapting our text-mining tools to your specific needs. This approach often yields greater accuracy, increases employee buy-in and integrates well with other initiatives or system developments.

Experienced teams
Our pool of experts consists of data scientists with a strong track record in machine learning, NLP, AI and cloud-computing as well as subject matter experts available to pre-train the text-mining tools for the given use case.

Individual project scope
We offer projects ranging from conducting initial feasibility studies and developing prototypes for text-mining solutions to integrating fully functioning text-mining tools in our clients’ IT infrastructures and process landscapes.

End-to-end service
Our services range from developing tailored text-mining back-end engines, building interfaces to existing systems, customizing the front-end, preparing data for algorithm training (labeling), application implementation and maintenance, including workflow management integration.
Recent TextMiner Use Cases (1/2)
Automatic **extraction** of specified conditions from non-standardized loan contracts

**Extensive regulations** demand comprehensive, retrospective recording of information from non-standardised loan contracts.

As a result, in a current project with a top 3 federal state bank, information regarding the following special conditions have to be made completely available to the IT systems from the loan inventory:

- Cancellation rights
- Prepayment rights
- Line-of-credit options
- Interest period transfer options
- Caps/floors
- Other conditions

The **manual, retrospective recording** of this information from thousands of loan contracts is not operationally feasible.

The **Deloitte TextMiner** recognises the relevant conditions within the loan contracts using artificial intelligence, then automatically extracts, aggregates and presents them in a format tailored for the client.

The results of the classification are formatted in a table and displayed in the GUI.

The standard data exchange format **JavaScript Object Notation (JSON)** is used for further processing.

Identified text passages are highlighted after uploading and processing.
Recent TextMiner Use Cases (2/2)
Automatic classification of invoices and subsequent information retrieval

Manual classification of invoices is a tedious task for human employees. Volumes of repetitive work invariably lead to fatigue and with it decreasing performance and quality. Even non-standardized invoices are often sufficiently similar in structure, enabling detection of patterns via text mining and the classification of the respective document into one of several predefined categories.

The Deloitte TextMiner classifies the invoices with high precision using artificial intelligence. After classification, rule based methods may be successfully applied to extract relevant data. Results are presented intuitively to facilitate frequent monitoring and evaluation. They may also be exported in CSV format.