

Transformation of audit work as a result of digitalisation

Challenges, areas of application, risks

Markus Erlmoser

PEMPAL Cross-COP Leadership Meeting , 26. March 2025



Introduction

- Digitalisation as a driving force for change in business and administration
- Transformation of manual audit processes to automated, data-driven analyses
- Digitalisation as an opportunity for further development and repositioning of internal auditing



New demands on internal auditing:

- Adaptation to digital working methods
- Use of large amounts of data to increase efficiency
- Increase in audit quality through data-driven analyses

Change in the role of internal auditing:

- From retrospective control to a proactive, advisory role
- Stronger integration into strategic decision-making processes through data-based insights
- Support for digital transformation through continuous risk analysis

Challenges in data analysis for IA

- **Data quality and integrity:**
 - Ensuring the accuracy and reliability of data
 - Consistent data formats and standards
- **Data privacy and security:**
 - Compliance with data protection regulations
 - Secure storage and transmission of data
- **Data accessibility and availability:**
 - Ensuring access to required data
 - Management of data silos and integrated data flows



Challenges in data analysis for IA

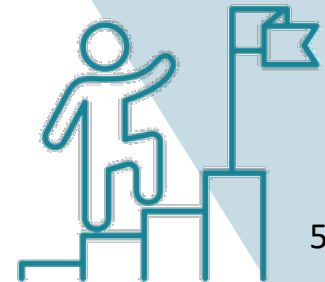
- **Complexity of data:**
 - Dealing with large amounts of data (Big Data)
 - Processing and analysing different data formats and sources
- **Tool and technology selection:**
 - Selection of the appropriate analysis tool
 - Integration of analysis tools into existing system landscapes
- **Skills and know-how:**
 - Skills in the use of analysis tools and methods
 - Understanding of data structures and analysis methods



Challenges of digital transformation

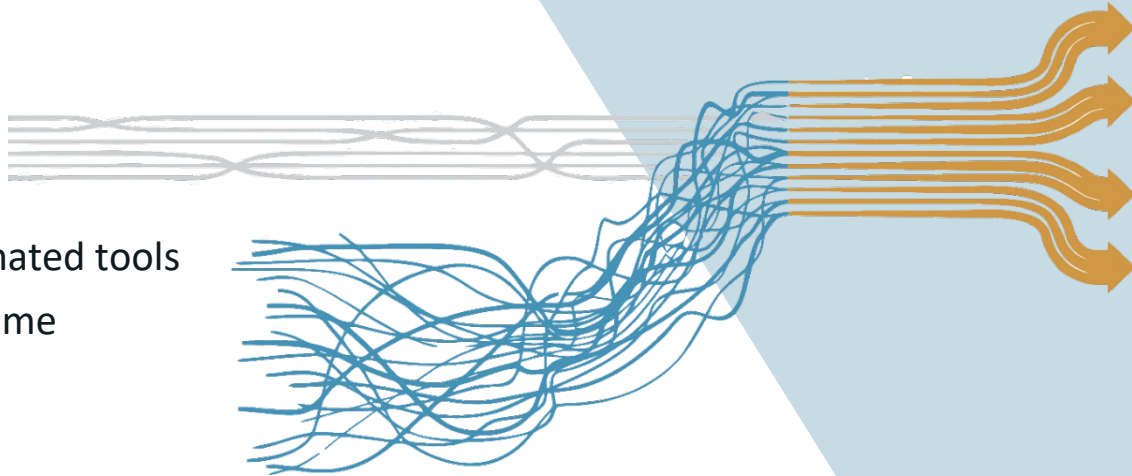
Change through digitalisation: increasing efficiency vs. increasing complexity

- Results of the latest audit of ICT investments:
 - Cost-benefit analysis (evaluation of financial and operational impacts, identification of actual efficiency improvement potential, etc.)
 - Implementation challenges (understanding of technical developments, acceptance issues, lack of expertise, etc.)
 - Sustainable IT strategies (long-term yet flexible solutions, avoiding isolated solutions, IT security and data protection as central components of digital transformation)
 - Rapidly developing environments vs. multi-year projects
 - Dependence on external IT service providers



Importance of data analysis in internal auditing

- **Value of data:**
 - Basis for relevant decisions
 - Identifying risks and patterns
- **Evolution of data analysis:**
 - From manual analysis to automated tools
 - Enabling deep insights in real time
- **Core of data analytics:**
 - Pattern recognition
 - Identifying risk factors and value enhancement options



Application and value of data analysis in internal audit



- **Application areas of data analysis**

- Fraud detection: Identify irregularities.
- Risk management: Identifying risk factors and vulnerabilities
- Process optimisation: Increasing efficiency through improved processes



- **Value of data analysis**

- Identifying potential savings
- Uncovering hidden patterns and trends
- Illuminating optimisation opportunities



- **Data-driven decision-making:**

- Data as a basis for proactive strategy development
- Support in prioritising audit issues

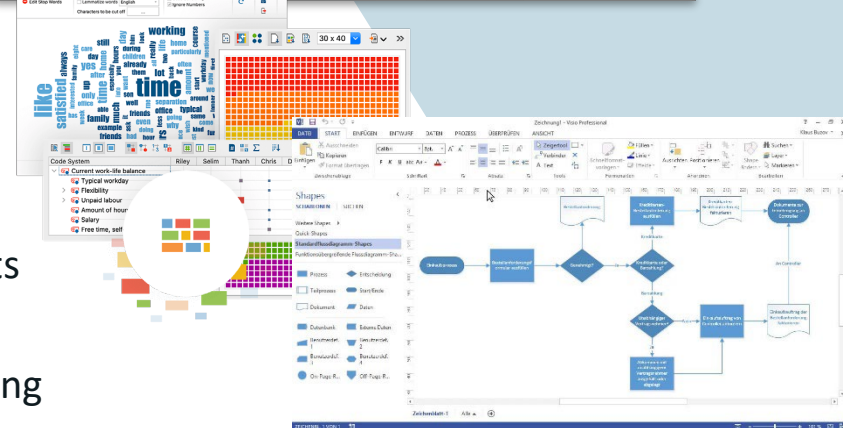
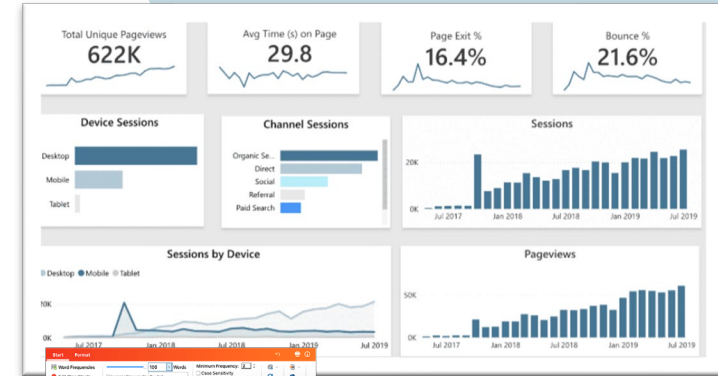
Risks and challenges of using AI

- Data protection and compliance:
 - Ensuring GDPR compliance
 - Control over data processing and storage
- “Black box” issue:
 - Lack of transparency in AI-supported decisions
 - Necessity of explainable AI
- Risks of misinterpretation:
 - Distortions in data models
 - Quality control of AI-generated analyses

Solution approaches to minimise risk:

- Combining AI analyses with human expert knowledge
- Regular validation and calibration of models
- Implementation of ethical AI guidelines





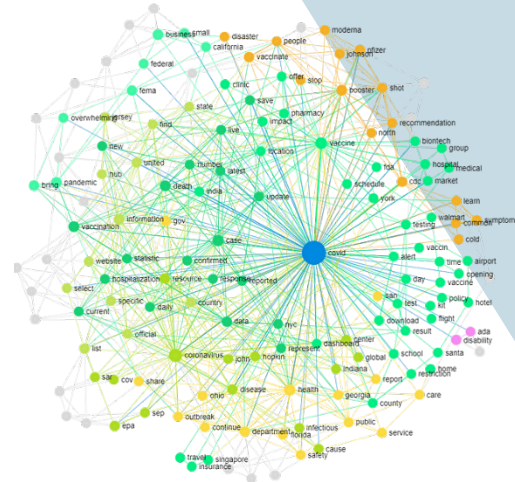
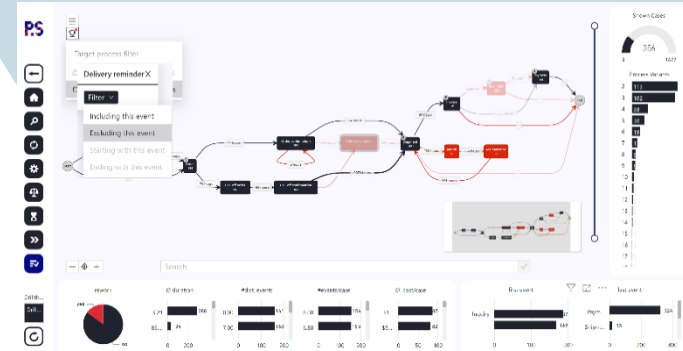
Analysis tools overview

PROCESS.
SCIENCE

sas

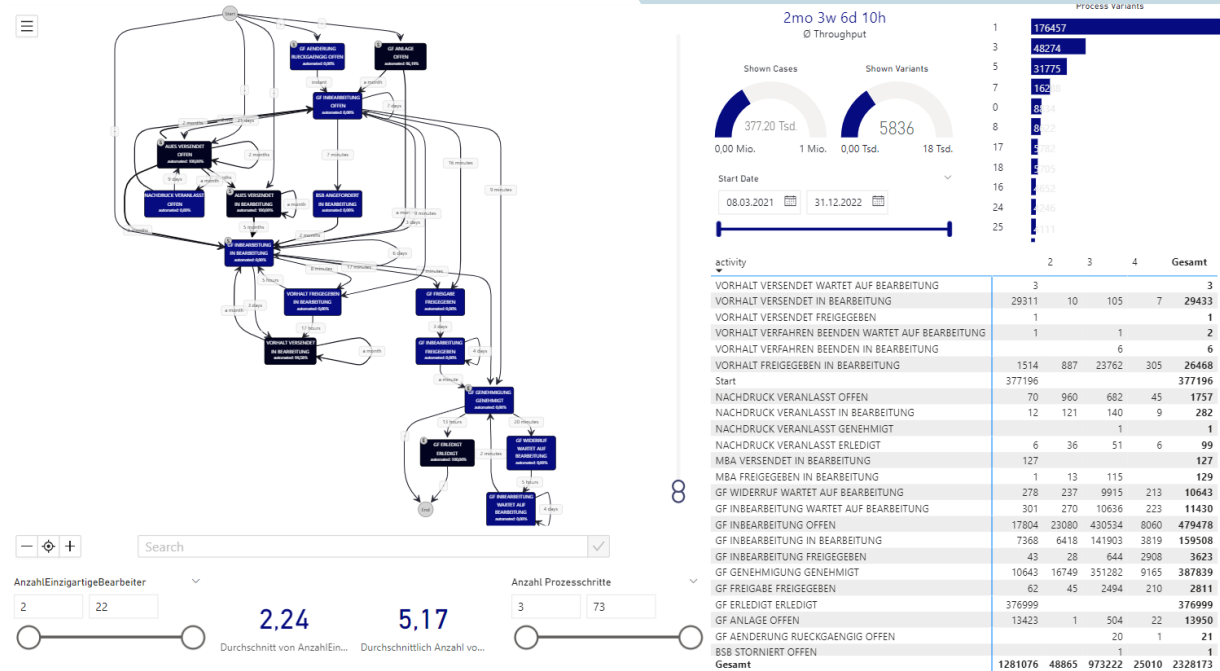


- **Process Science:**
 - Process Mining for deeper process analysis
 - Visualisation of process flows
- **SAS Analytics Pro:**
 - Comprehensive data analyses
 - Creation of predictive models
- **Infranodus:**
 - Text mining and analysis
 - Network analysis and visualisation



Case Study: Process Mining

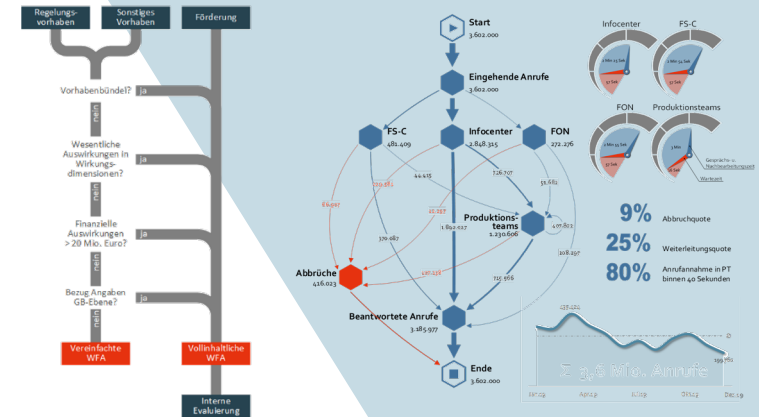
- Analysis of the family allowance processes
- Around 10 million data sets
- Thousands of different process variants
- Inefficiencies due to repetitions (loops) in the processes
- Deviations from the target processes
- IT-driven process design



Transformation of audit work as a result of digitalisation

Visualisation of audit results

- **Importance of visualisation:**
 - Increasing the clarity and understanding of data
 - Promoting data-driven decision-making
- **Types of visualisations:**
 - Charts, graphs and heat maps for quantitative data
 - Networks and cluster analyses for qualitative data
- **Data preparation:**
 - Cleaning and structuring raw data
 - Selection of relevant metrics and indicators
- **Stakeholder-adapted visualisation:**
 - Adaptation of visualisation to different target groups
 - Focus on clarity and directness of communication



		Institutionen				
Prozesse		Lieferanten / Dienstleister	Einkaufspartner (bspw. B&G)	Beschaffende Stelle	Bedarftäger	Stakeholder
Beschaffungscontrolling	Bedarfsmittlung	Anfragen / Akquisition	Anfragen / Akquisition	Bedarfsanforderung	Planung	
	Beschaffungsmarktforschung	Marktforschung	Marktforschung			
	Make or Buy	Anfragen / Angebote		Analysen		
	Bestellung inkl. Abwicklung	Verhandlungen/Bestellungen	Kontrollen/Zahlungen	Medlungen	Kontrolle	
	Lieferantenmanagement	Lieferantenauswahl/-entscheidung		Lieferantenbeurteilung		

Transformation of audit work as a result of digitalisation

The future of data analysis in internal audit

- **Artificial Intelligence (AI):**
 - Automated anomaly detection
 - Predicting risks through deep learning models
- **Real-time analytics:**
 - Continuous monitoring and reporting
 - Immediate detection and response to risks
- **Automated auditing processes:**
 - Integration of bots and automation tools
 - More efficient, AI-driven reviews
- **Ethics and data stewardship:**
 - Growing importance of data protection
 - Ethical guidelines for data analysis in auditing

