Deloitte.

ALTERNATIVE INVESTMENTS

REGULATORY

INVESTMENT FUNDS

RISK & ASSET MANAGEMENT

BANKING

SUSTAINABILITY

TECHNOLOGIES INNOVATION

Risk & Asset management | Digital processes for improving the evaluation and monitoring of risk

Link'n Learn – 25 June 2025

Getting Started

Here with you today

Hatice Baskaya
Director
Cyber Governance and Compliance
+352 451 453 586
hbaskaya@deloitte.lu

Maurice Schubert
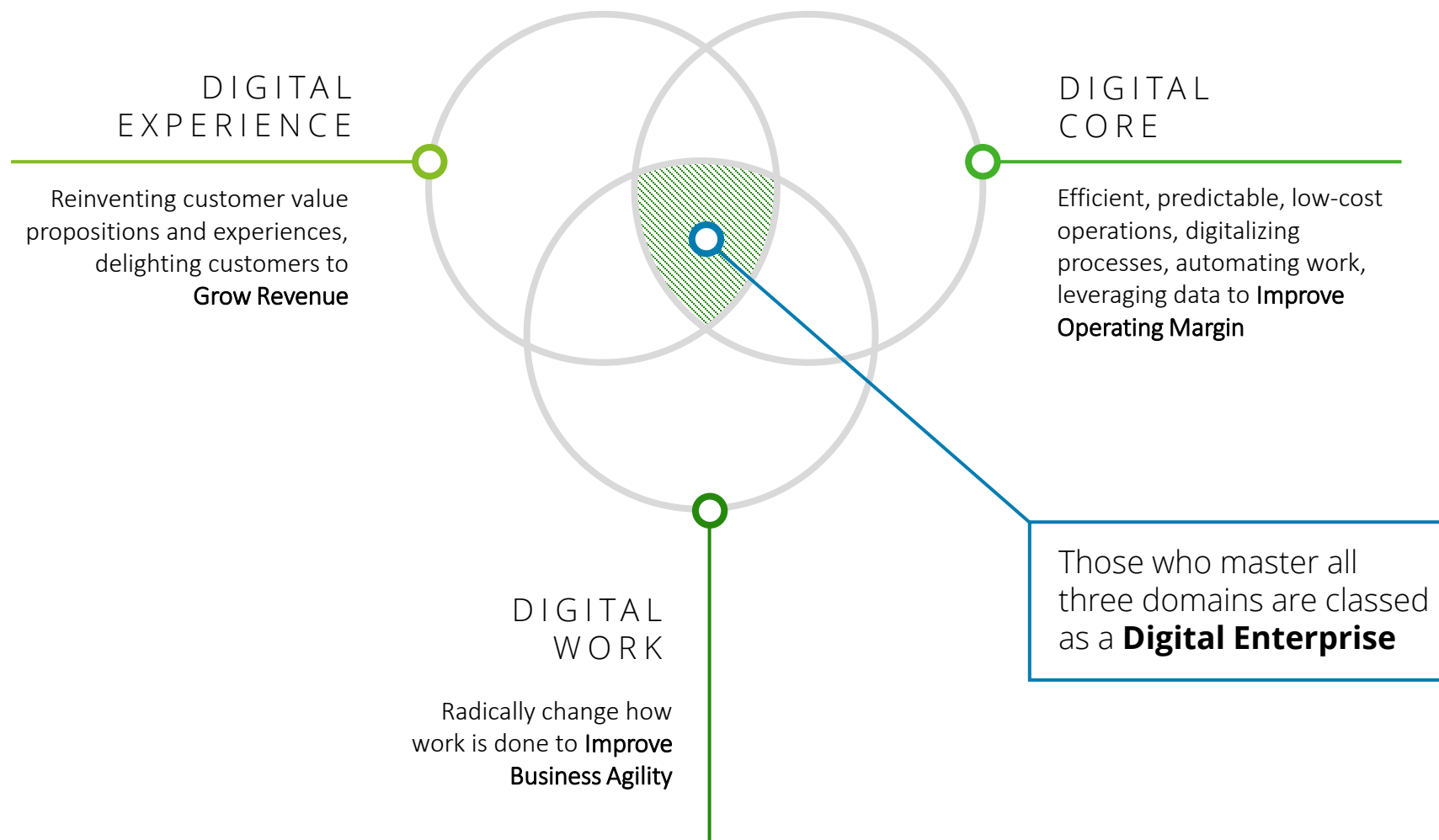Partner
Cyber
+352 621 568 513
mschubert@deloitte.lu

Agenda

1 Context

2 Controls automation

3 Process mining

Context

Becoming a digital organization

To thrive in the digital age, to become **digital**, organizations need to master three digital domains: Customer, Core and Work.

With ever increasing complexities of the regulatory landscape and need to demonstrate continuous compliance for organizations, digital is **also becoming an imperative for risk management**. Indeed, digital can enable to decrease the costs of executing and monitoring business process controls whilst increasing their effectiveness.
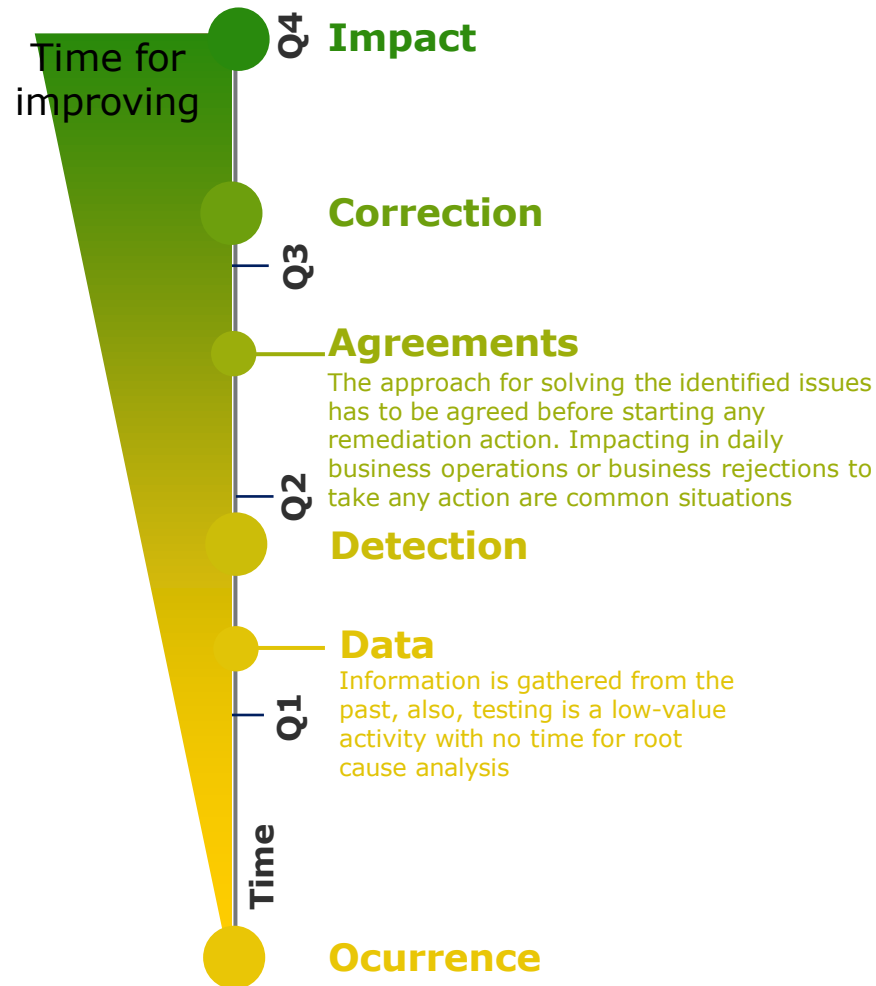
DIGITAL EXPERIENCE

Reinventing customer value propositions and experiences, delighting customers to **Grow Revenue**

DIGITAL CORE

Efficient, predictable, low-cost operations, digitalizing processes, automating work, leveraging data to **Improve Operating Margin**

DIGITAL WORK

Radically change how work is done to **Improve Business Agility**

Those who master all three domains are classed as a **Digital Enterprise**

Context
Manual control execution

"Control Continuous Monitoring is not a new trend for evolving the control model, Companies are implementing this approach for more than 10 years ago.

The main reason for introducing a CCM approach in a Company's Control Model is for reducing the gap between the event occurrence and the implementation of remediation actions"

Manual Testing Control Execution

Time for improving

Time

Q4 — **Impact**

Correction

Q3

Agreements
The approach for solving the identified issues has to be agreed before starting any remediation action. Impacting in daily business operations or business rejections to take any action are common situations

Q2

Detection

Data
Information is gathered from the past, also, testing is a low-value activity with no time for root cause analysis

Q1

Ocurrence

Main Issues

Issues are not going to be solved by themselves. Problems are usually bigger as the time goes by.

Focus on addressing the incident instead solving the cause. Substantive tests and actions are the usual approach adding extra work to both business and second line

High effort in analyzing and justifying past events

Lack of visibility

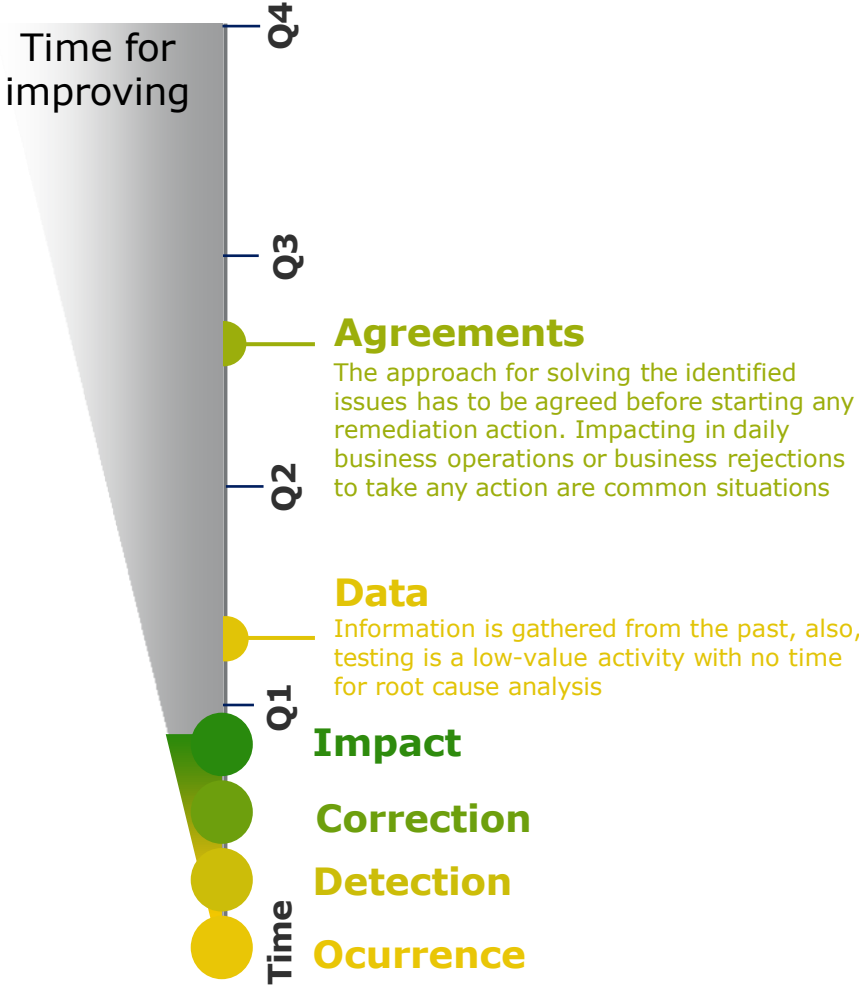Manual analysis of data can derive in errors or lack of precision.

Context
Continuous Control Monitoring Benefits

"Nowadays, CCM approach not only consists of reading data automatically from the sources and raising alerts.

Technology can also be applied on different parts of the process for getting added value on different situations that could happen in the future"

Continuous Control Monitoring Execution

Time for improving

Q4

Q3

Agreements
The approach for solving the identified issues has to be agreed before starting any remediation action. Impacting in daily business operations or business rejections to take any action are common situations

Q2

Data
Information is gathered from the past, also, testing is a low-value activity with no time for root cause analysis

Q1

Impact

Correction

Detection

Ocurrence

Time

Main Benefits

Detection and prevention of errors and exceptions can take place at the start of the process

Launch automated workflows on a periodic basis alerting risk owners of the fact that access risk violation has occurred and the actions they envisage to take to mitigate those risks.

With CCM, incident identification could happen upon occurrence.

Risk quantification, that is, what is the financial amount exposure underpinning the materialized access risk.

Full populations of data can be analyzed in near real-time
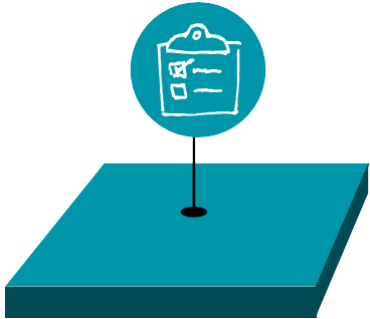
Controls automation

Controls automation
Tools & Techniques

There are several areas for improving the control model. The techniques and tools commented below are not exclusive and could be combined for addressing any kind of situation.

| Improvement Area	Technique	Benefit	Tools
Control Assessment Automation	Data & Config monitoring from transactional Systems	• Reduce effort on analysis • Reduce detection time • Increase precision	• ETL Middleware for data integration and transformation • GRC System for control management
Data Analysis Improvement	Machine learning helps in adapting to changing patterns of fraud	• Drilling into and quantifying company issues at the activity and user level • Provide insights and early watch alerts	• Data Analytics Tools
Automation of remediation actions	Use of RPA/Gen AI for remediation or generation of evidences	• Reduce efforts • Homogeneous ad-hoc remediation actions	• Data Analytics • RPAs • GenAI / Machine learning
Control transformation	The use of Digital tools and techniques, such as process mining to understand and then transform existing processes & controls	• Revealing an end-to-end view of processes • Providing benchmarks for internal leading practices • Improve control rationalization	• Process Mining Tools • AI based/machine learning technologies
Improve Risk Quantification	Use data from past events in order to quantify Risk asessments	• Improve Risk Assessment • Improve root cause analysis in order to stablish mitigating actions	• Data Analytics • Process Mining Tools • GRC System

Controls automation
Maturity level

Manual control testing

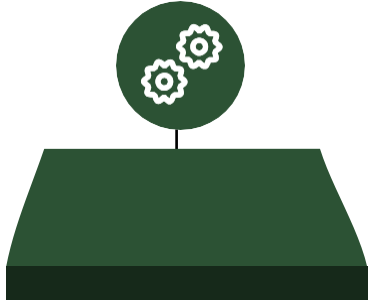Traditional manual control testing, with sampling methods, etc.
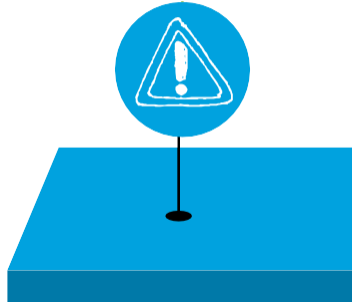
Ad-hoc data analytics
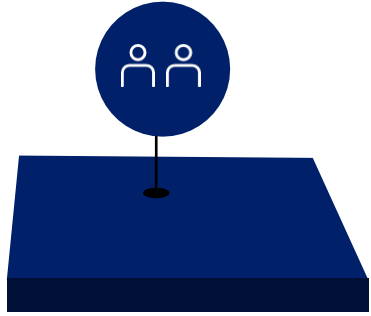
Data analysis to reduce the scope of the manual testing

Illustrative solutions

IDEA

SAS

acl

Advanced automated controls

Automated refresh, improved visuals and data discovery

Illustrative solutions

Qlik Q

Power BI

Continuous Control Monitoring (CCM)

Workflows integration for issue management

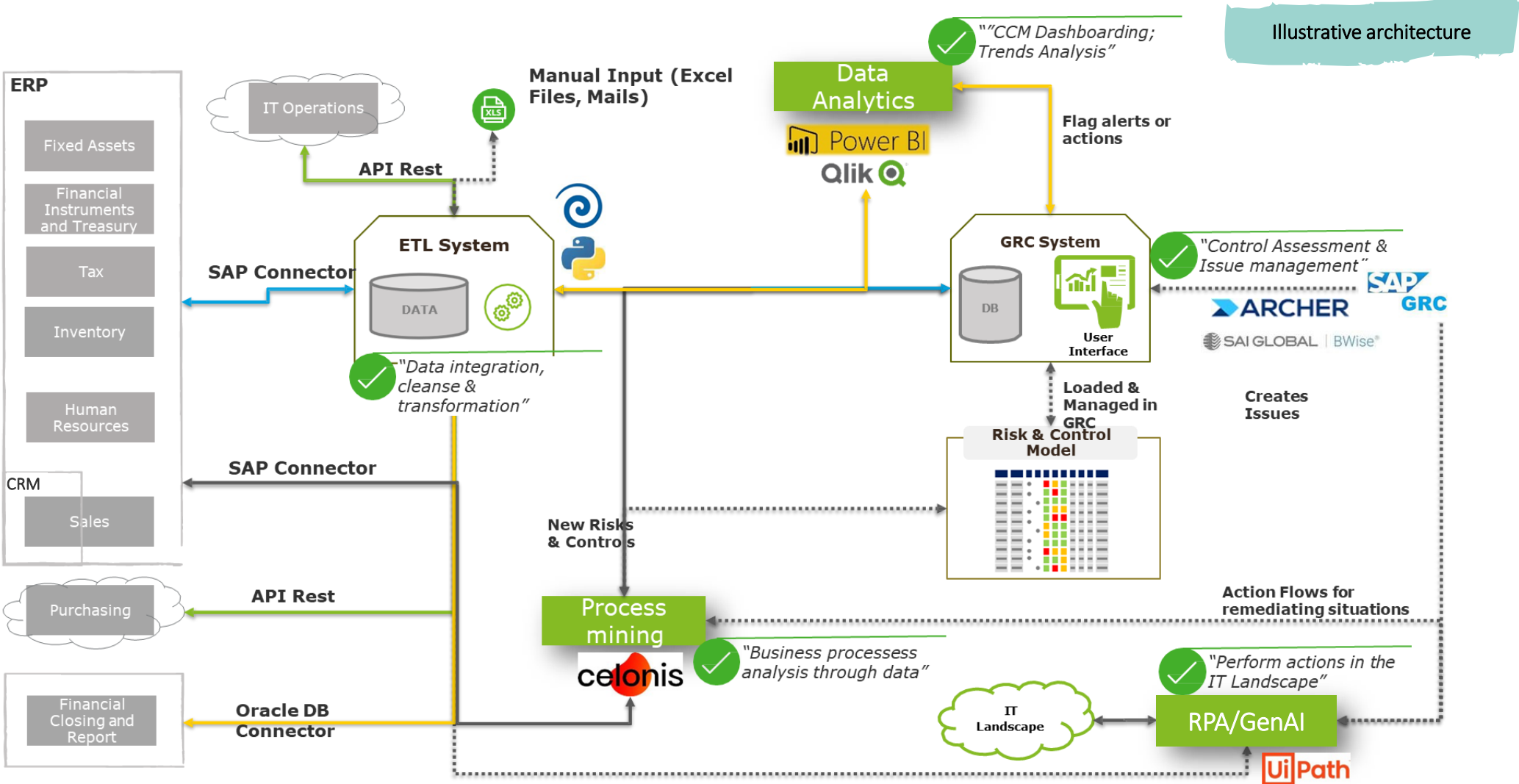*Illustrative solutions*

ARCHER

SAP GRC

SAI GLOBAL | BWise®

Controls Integration

Automated controls embedded in processes which generates the required digital evidences

Illustrative solutions

celonis

UiPath

SAP Signavio

software AG

Reveal security

GenAI

MISTRAL AI_
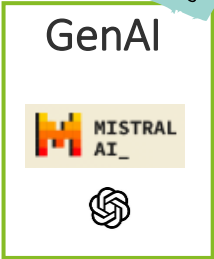
Controls automation
Continuous Control Monitoring IT Landscape example

Illustrative architecture

ERP
- Fixed Assets
- Financial Instruments and Treasury
- Tax
- Inventory
- Human Resources

CRM
- Sales
- Purchasing
- Financial Closing and Report

IT Operations

Manual Input (Excel Files, Mails)

API Rest

SAP Connector

SAP Connector

API Rest

Oracle DB Connector

ETL System
DATA
✓ *"Data integration, cleanse & transformation"*

Data Analytics
Power BI
Qlik

""CCM Dashboarding; Trends Analysis"

Flag alerts or actions

GRC System
DB
User Interface
✓ *"Control Assessment & Issue management"*
ARCHER
SAI GLOBAL | BWise
SAP GRC

Loaded & Managed in GRC

Risk & Control Model

Creates Issues

New Risks & Controls

Process mining
celonis
✓ *"Business processess analysis through data"*

Action Flows for remediating situations

✓ *"Perform actions in the IT Landscape"*

IT Landscape

RPA/GenAI
UiPath

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Public   10

Controls automation
Automated Control Identification

EXAMPLE PROCESSES

- Fixed Assets
- Financial Instruments and Treasury
- Human Resources
- Tax
- Own Funds
- Inventory
- Purchasing
- Sales
- Financial Closing and Report

FROM RISK ANALYSIS

IDENTIFICATION OF CONTROLS FOR AUTOMATION

BASED ON TECHNOLOGY

PERFORM GAP VERSUS DELOITTE´S AUTOMATED CONTROLS LIBRARY (DACLA)

BALANCED SCORECARD

- KRI's
- Compliance Indicators
- Alerts
- Automated Controls

It is recommended starting with **automating controls**, that can form part of a **balanced scorecard** roll-out in the **subsequent phases**

Controls automation
Automated Control Identification

IDENTIFICATION OF CONTROLS FOR AUTOMATION
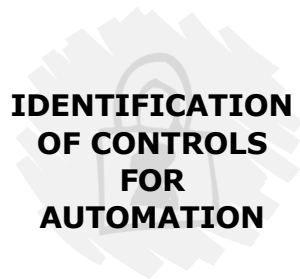
Obvious controls

Data is already identified and available. Maybe the control is not key for the model but saves time and is used as a starting point for setting up the foundations of CCM approach.
Usually, these controls are focused on reading data from a single source system by monitoring configuration or even generating evidence of a control.

Value-Add controls

Digitize controls or activities that are usually, time consuming and cause a great impact on business activities such as:

- Reduction of costs regarding control execution or potential regulatory sanctions
- Transformation of the activities done by the assessors (review and apply expert judge instead of prepare evidences)
- Deeper insights and trend analysis
- Improved business experience

Transformational controls

By combining different tools & techniques, digitalization can reach a new level. The objective would be replacing former controls by new ways for monitoring the business activities, replacing testing periods and evidences by real time checks and predictive alerts that can be managed before the event happens. Efforts are usually higher in terms of building up the solution and in educational changes. Nevertheless, the return on investment has the potential to be significant, as:

- Reduce historical errors, financial losses, and/or provide significant visibility across organization
- Digitization may take some time as either data is difficult to access or requires significant manipulation

Effort

Value

Controls automation
Automated Control Identification

Deloitte Automated Control Library Accelerator

Time
Reduced time and cost to implement the Automated Controls

Best practices
Precompiled library of best practice automated controls capitalizing on the learnings and experience of Deloitte´s prior successful client deployments (continuously enriched)

Increasing maturity
Further extend the coverage of automated controls thereby increasing the maturity of the overall controls landscape

Deloitte can help you unlock this potential by rationalizing your risk and controls framework, embedding automated controls into the day-to-day processes supported by Systems and providing effective and efficient governance over your manual and automated controls in the manner described in our Deloitte accelerator framework approach.

Control Automation

Going one step further with Machine Learning and Generative AI

- **Predictive Analysis:**
  GenAI uses sophisticated pattern recognition to identify financial trends and predict potential risks, helping companies mitigate potential threats.

- **Real-Time Risk Detection**:
  Gen AI models can be implemented to monitor real-time transactions and flag any abnormal patterns that might indicate fraudulent activities.

- **Automating Compliance Processes**:
  GenAI can automate risk and compliance reporting, resulting in increased efficiency and accuracy.

- **Improving Decision-making Processes:**
  By analyzing complex data sets, GenAI can provide valuable insights that assist executives in making well-informed, risk-aware decisions.

- **Increased Adaptivity:**
  GenAI can be trained to learn and adapt to constantly changing risk environments, thereby retaining its efficiency in identifying and mitigating risks.

- **Process Automation:** GenAI can be used to automatically perform corrective actions

Examples where real-time monitoring of transactions can be applied:

Anti-Money Laundering (AML): GenAI can streamline AML operations by recognizing suspicious patterns, such as frequent large transfers or sudden account behavior change. The AI algorithm can learn in real-time from immense datasets predicting and flagging potential criminal activities.

Retail Banking and Online Payments: GenAI, abnormal behaviors in online banking, such as sudden unusual spending or uncommon login locations, can be quickly identified. The AI system continuously learns and updates its knowledge base, being adaptive to new emerging fraudulent techniques. This real-time responsiveness drastically reduces possible impacts of fraudulent activities.

AI SERVICES

GENERATIVE AI APPLICATIONS

LARGE LANGUAGE MODELS

AI HARDWARE & SOFTWARE INFRASTRUCTURE
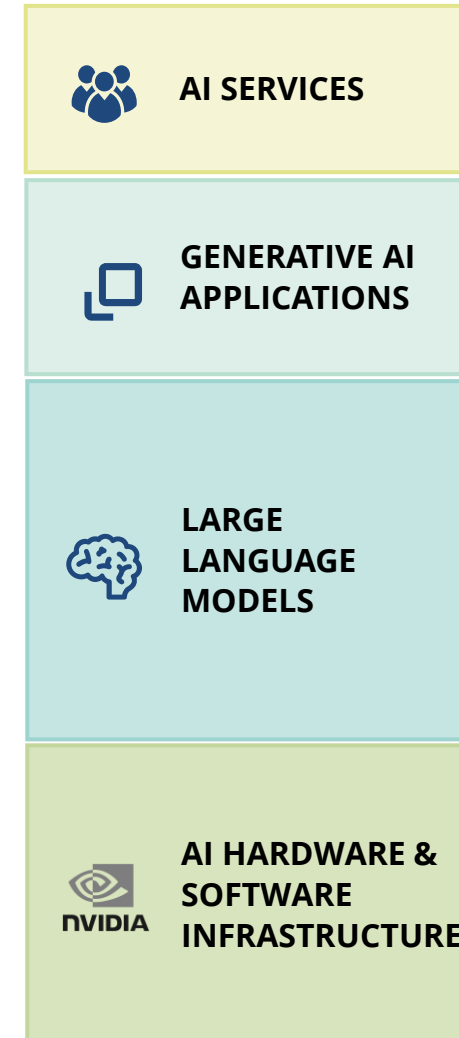
Offered primarily through 3 channels:

1. **Hyperscalers Cloud Infrastructure**
   Google Cloud   aws   Microsoft Azure

2. **Specialized GPU Cloud Vendors**
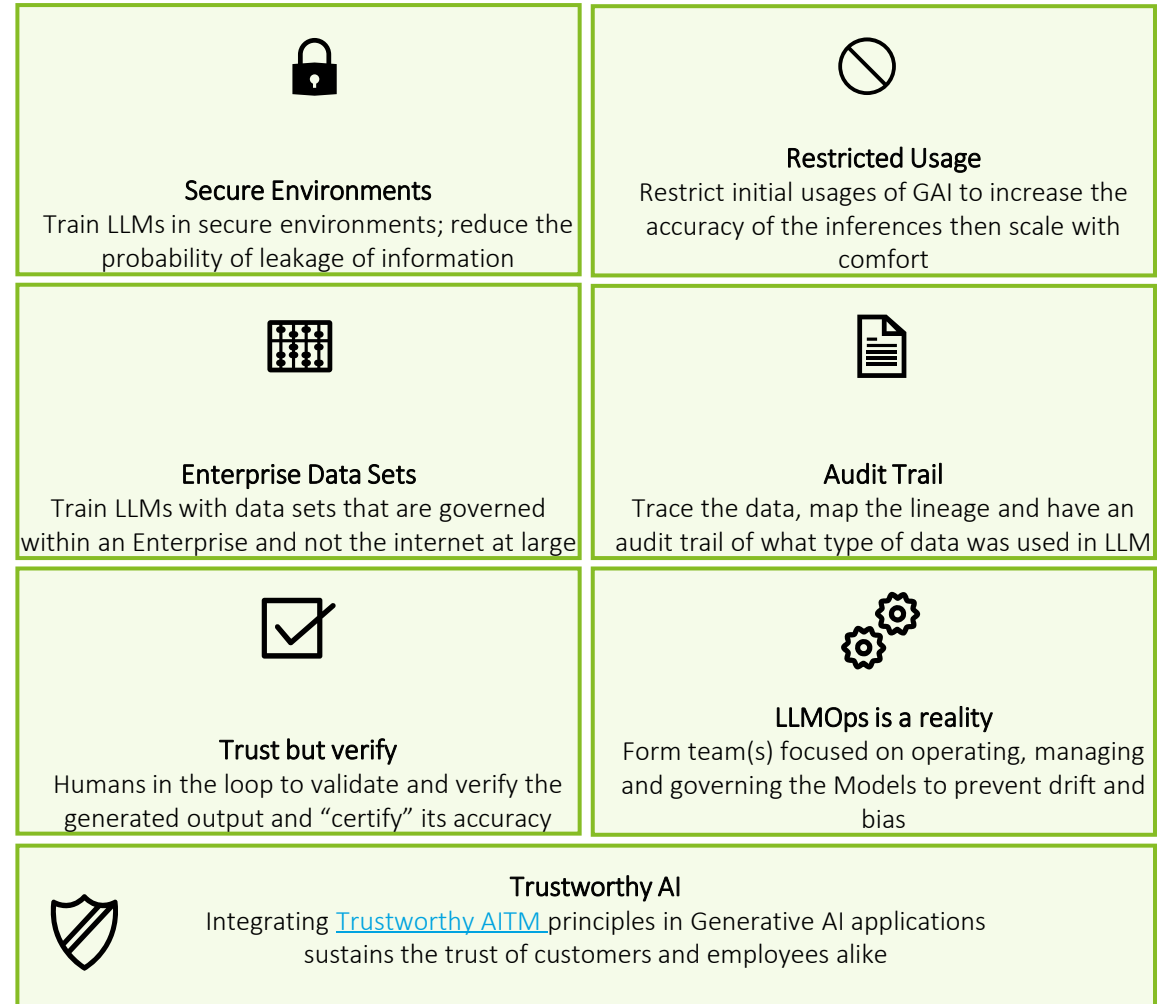   CoreWeave

3. **In-House Data Center**

Business Risks of Generative AI

AS PRIMARY RISKS EMERGE ...	... COMMON GUARDRAILS MUST BE IMPLEMENTED

RISK OF...

1 **AMPLIFICATION OF BIASES**
Inherent biases in the underlying data can be amplified when Foundation Models are trained on them

2 **SAFE USAGE**
Governance must consider both where and how Foundation Models are used (e.g., autonomous action for machinery in a factory floor)

3 **RESPONSIBLE APPLICATIONS**
Use cases will be contemplated with heightening levels of autonomy (e.g., enhanced cyber threat detection monitoring)

4 **SOVEREIGNTY**
AI Models trained on certain data sets will be subject to sovereignty / residency regulations (e.g., run models only on data centers within a certain jurisdiction)

5 **LACK OF CERTIFICATIONS**
Foundation Models trained for domain specific insights may also be regulated as human experts are today (e.g., Bar exam for legal professions)

Secure Environments
Train LLMs in secure environments; reduce the probability of leakage of information

Restricted Usage
Restrict initial usages of GAI to increase the accuracy of the inferences then scale with comfort

Enterprise Data Sets
Train LLMs with data sets that are governed within an Enterprise and not the internet at large

Audit Trail
Trace the data, map the lineage and have an audit trail of what type of data was used in LLM

Trust but verify
Humans in the loop to validate and verify the generated output and "certify" its accuracy

LLMOps is a reality
Form team(s) focused on operating, managing and governing the Models to prevent drift and bias

Trustworthy AI
Integrating Trustworthy AITM principles in Generative AI applications sustains the trust of customers and employees alike
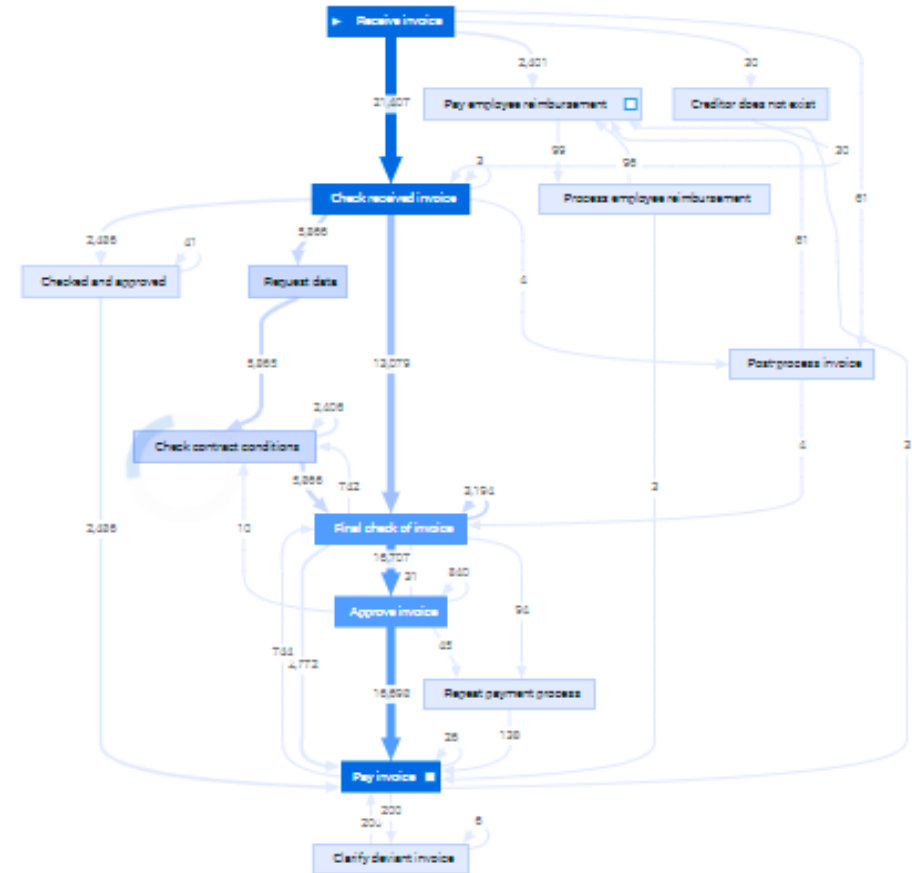
Process mining

Process mining

Most processes are more complex than our expectation.
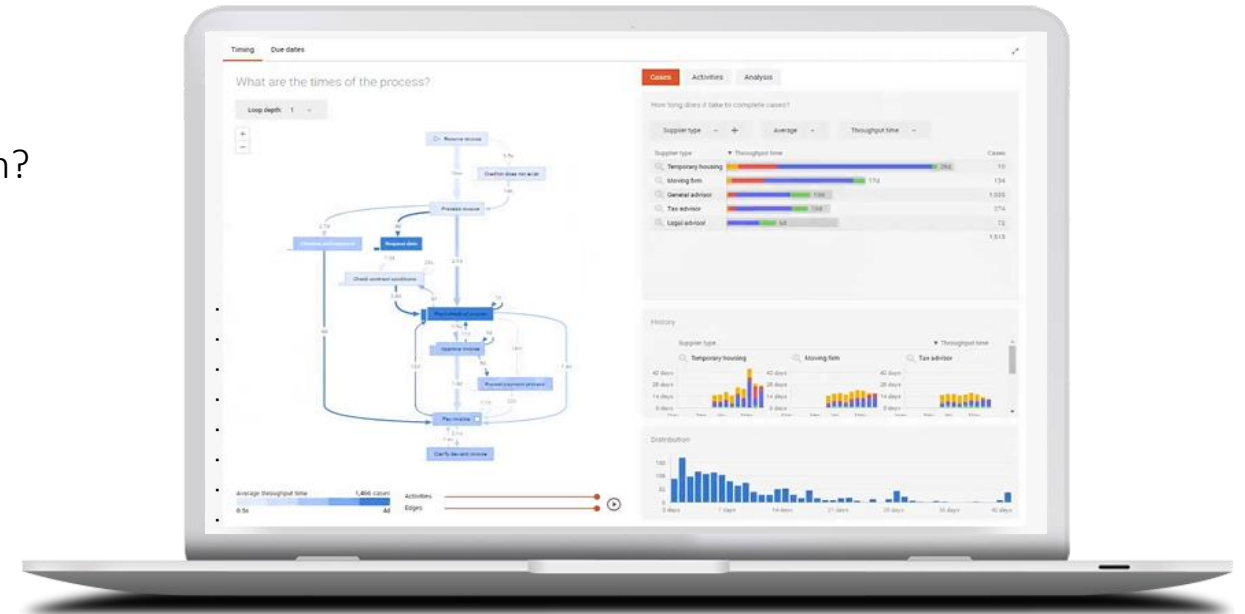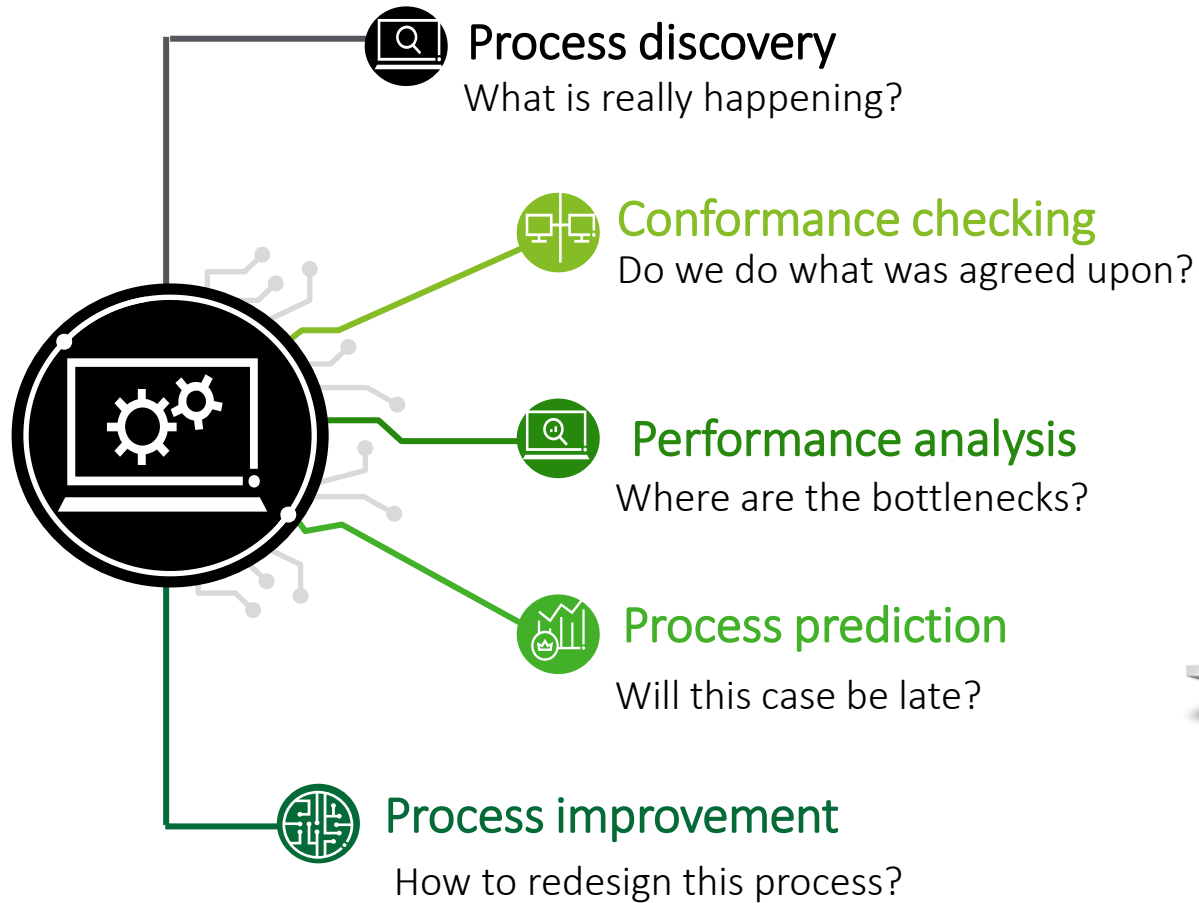
From the expected process...
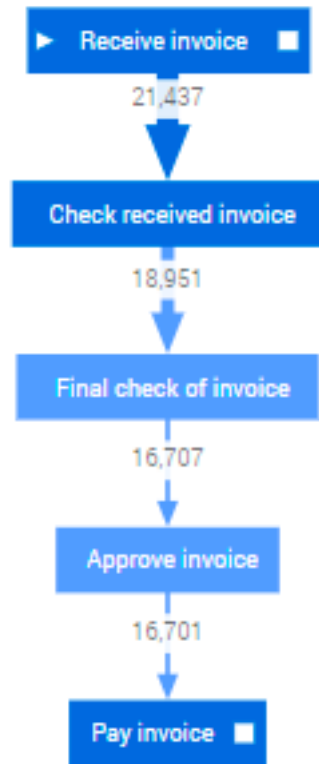
... to the actual process

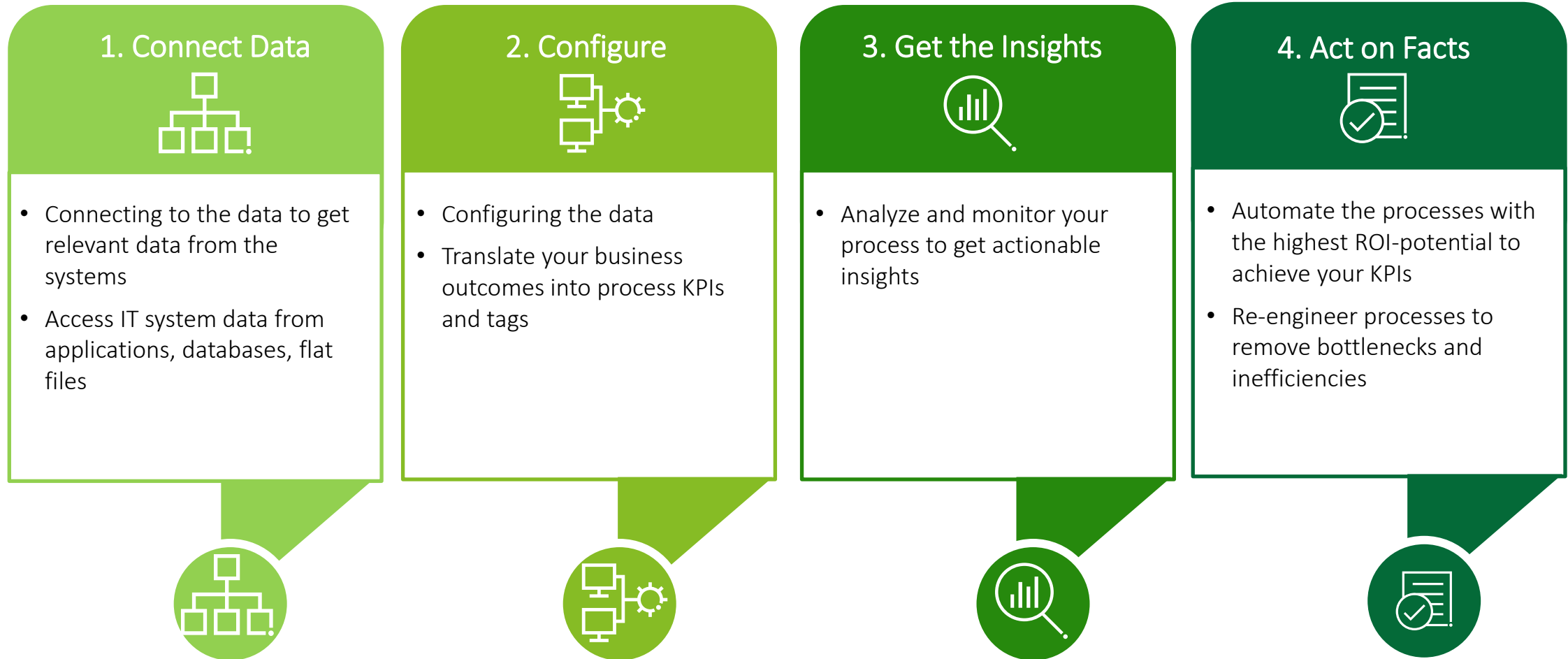Process mining

What can process mining be used for?

Process discovery
What is really happening?

Conformance checking
Do we do what was agreed upon?

Performance analysis
Where are the bottlenecks?

Process prediction
Will this case be late?

Process improvement
How to redesign this process?

Process mining
How does it work in practice?

1. Connect Data

- Connecting to the data to get relevant data from the systems
- Access IT system data from applications, databases, flat files

2. Configure

- Configuring the data
- Translate your business outcomes into process KPIs and tags

3. Get the Insights

- Analyze and monitor your process to get actionable insights

4. Act on Facts

- Automate the processes with the highest ROI-potential to achieve your KPIs
- Re-engineer processes to remove bottlenecks and inefficiencies

Process mining
Understanding your process from end to end will help
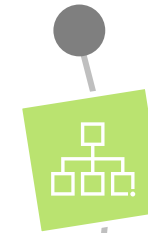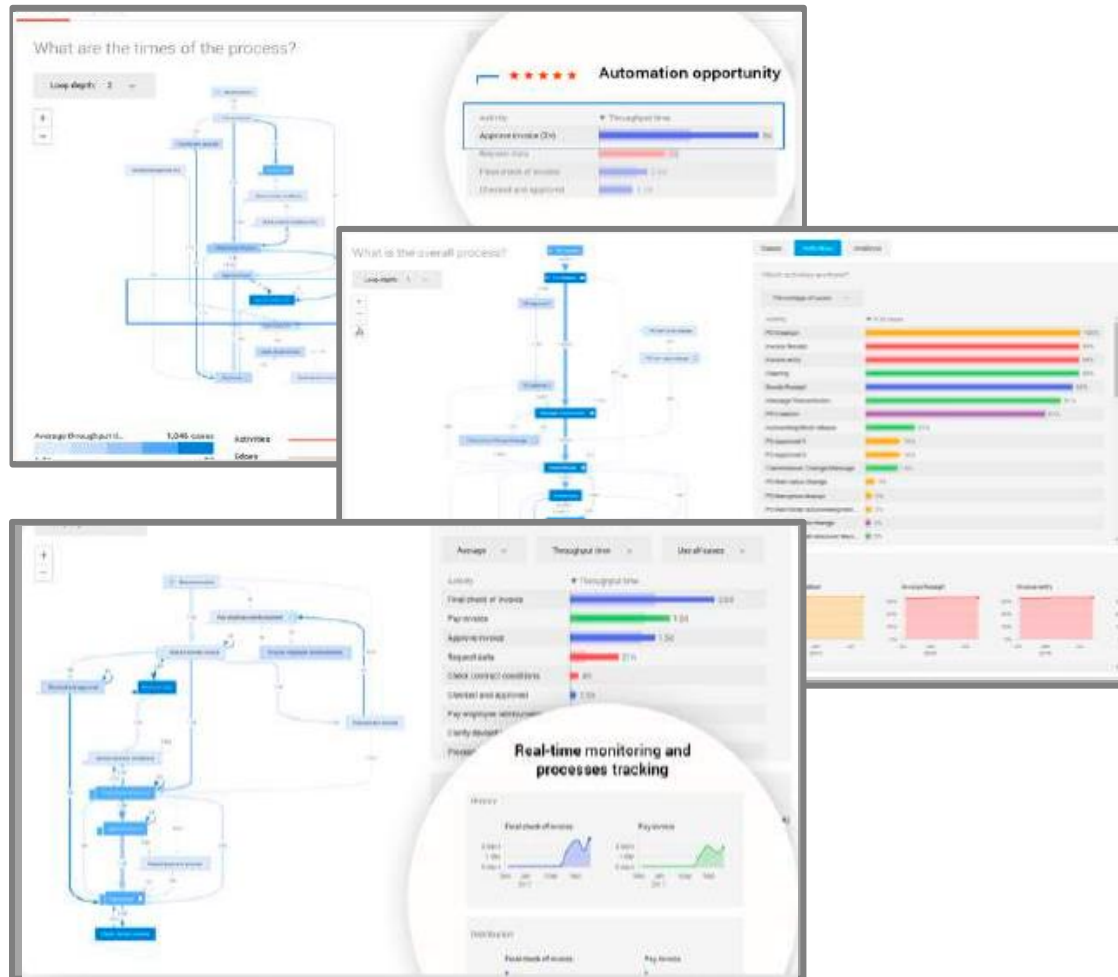
Increase Efficiency
Having a clearer view of the process will enable more precise process reengineering to increase efficiency

Reduce Risk
Identify areas with greatest risk to business processes and take the appropriate actions to mitigate the risks

Maximize ROI for automation
Ensuring that RPA is implemented in the areas with the maximum utilization in a process for a maximized ROI

Accelerate RPA program
Discover and validate automation opportunities faster in your processes.

Focus efforts on business outcomes
Having an end-to-end view of the process will assist process owners to have a better focus on the outcomes of each operation and ultimately the business outcomes of the process

Process mining

Use cases and approach

PROCESS DISCOVERY & KPIs

- Identify critical cycle times
- Missing approvals
- Segregation of Duties
- Activities outside normal working hours

INTELLIGENT ROOT CAUSE ANALYSIS

- Maverick buying
- Identify fraud
- Process conformity
- Duplicate payments

DISCOVER

Find out how your process is executed in reality.

.

IMPROVE

Identify and eliminate weak spots and violations. Use proactive insights to prioritize actions leading to process improvement.

CONTINUE

Find your "Smooth path" and ensure continuous process efficiency, compliance, and quality.

Process Mining versus Process Modelling

Process mining and modelling are two key techniques that are core to process transformation and complement each other depending on the situation

PROCESS MINING (ALL TYPES)

Process mining is a family of techniques relating the fields of data science and process management to support the analysis of operational processes based on event logs. The goal of process mining is to turn event data into insights and actions.

WHEN THIS TECHNIQUE IS MOST EFFECTIVE

- Available data / time stamps along the process
- Clear object to track through the process
- 'Decent' data quality
- Some understanding of desired process
- Forensics – process not known or need for 100% accuracy and task level detail

PROS

- No need to rely on individual perceptions of process (less burden on people, more accuracy)
- Quantifies value of process breakdowns
- Can be used for varied platforms and systems
- Allows ongoing process review – early warnings on trends

PROCESS MODELING

Process modeling is a set of methodologies enabling the development of process models based on a combination of human input and available data

WHEN THIS TECHNIQUE IS MOST EFFECTIVE

- Limited data available
- Organizational-wide documentation need
- Bridge automated and non-automated (business, people and tech)
- Need for clear definition of all process and technology steps and interactions at Level 3/4
- Need for clear definition of all process and technology steps and interactions
- Traditional customer journey mapping

PROS

- Uses meta-data & full detail of all activities along a chain
- Rapid triage of source of pain points
- Allows linking of processes across an organization
- Supports training, compliance, centralized documentation, audit trails, and other needs

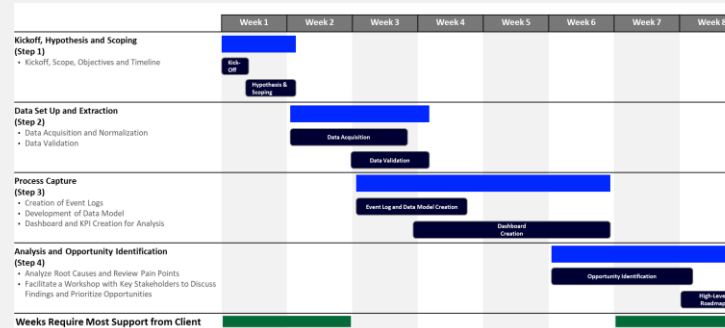# Process Mining requires technology, methodology and skills to be effective
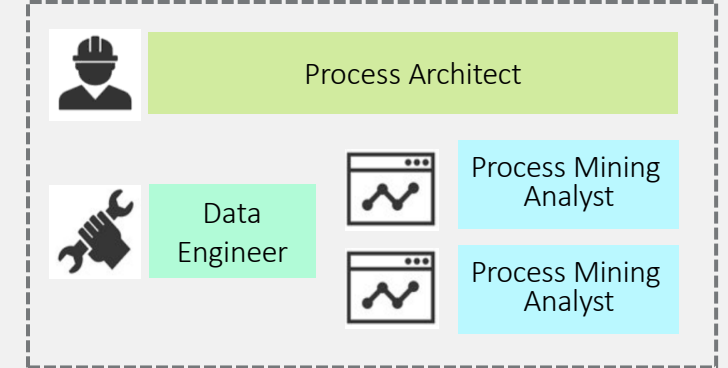
TECHNOLOGY

Core capabilities

Process models and analysis	Journey models and analysis
Comparative process mining	Process model enhancement
Data access and preparation	Business activity monitoring and management
Advanced process analysis	Task mining

Optional capabilities

Process orchestration	Execution support

METHODOLOGY

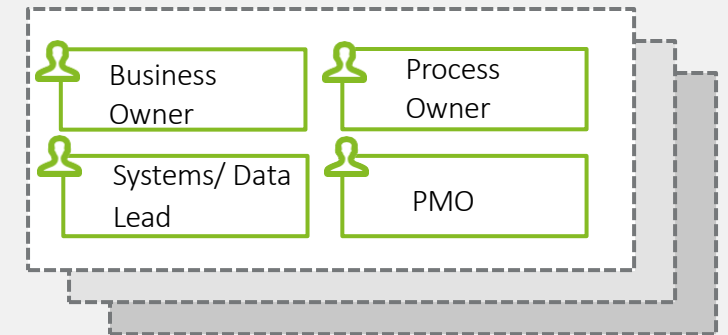| Phases	Process Selection	Source Data Set-Up	Process Mining	Value Area Identification	Value Realization Prioritization & Development
Key Activities	• Prioritize functional opportunities & strategic initiatives • Identify process for mining, aligned with strategic priorities as well as inputs from process workshops • Confirm process scope and KPIs	• Create data request • Identify source systems • Set up data extraction from source systems • Validate process data • Import relevant data into environment using Process Mining connectors • Validate and deploy data model	• Profile and transform data • Interpret, refine and customize Process Mining analysis • Create dashboards / visualizations and identify opportunities • Conduct Business Validation Workshop	• Identify, value and quantify opportunities • Conduct a Value Realization Workshop • Finalize opportunities	• Conduct workshop to create Roadmap for Realization • Develop Implementation Timeline and Resource Plan • Build a sustainability vision
Deliverables	• Draft Project Plan • Process Assessment Methodology • Requirements definition list	• Initial process connection • Continuous data connection set-up • First analyses developed	• Finalized analyses and dashboards	• List of Prioritized Opportunities	• Future State Roadmap & Timeline (high-level)
Client	• Process Owner / Business Sponsor to review strategic priorities and confirm candidate for mining	• Data Owner and System Owners to approve data extraction	• Process Owner / Business Sponsor to review findings	• Process Owner / Business Sponsor to review recommendations and prioritize opportunity realization areas	• Business Sponsor to sign off

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Kickoff, Hypothesis and Scoping (Step 1) • Kickoff, Scope, Objectives and Timeline	Kick-Off / Hypothesis & Scoping							
Data Set Up and Extraction (Step 2) • Data Acquisition and Normalization • Data Validation		Data Acquisition	Data Validation					
Process Capture (Step 3) • Creation of Event Logs • Development of Data Model • Dashboard and KPI Creation for Analysis			Event Log and Data Model Creation	Dashboard Creation				
Analysis and Opportunity Identification (Step 4) • Analyze Root Causes and Review Pain Points • Facilitate a Workshop with Key Stakeholders to Discuss Findings and Prioritize Opportunities						Opportunity Identification	High-Level Roadmap	
Weeks Require Most Support from Client								

SKILLS

Business process mining pod

- Process Architect
- Data Engineer
- Process Mining Analyst
- Process Mining Analyst

Functional stakeholders

Business Owner	Process Owner
Systems/ Data Lead	PMO

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