AI-based auditing

Hackathon case

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Context: auditing and its challenges

When public funding is granted to a project, the project partner is expected to submit an overview of its costs together with underlying evidence (invoices, payslips, …) to a first line control (FLC) organization. This organization checks – often manually - whether no mistakes or fraud can be found, and subsequently gives the green light to reimburse the costs made. These checks typically include: is the amount correct, is the date correct, has the right cost category been selected, was the public procurement law respected, …

To ensure that this setup works, there is a second-line control body (SLC, often called “audit”) that needs to validate that the materiality of errors made by FLC is below 2%. Today, this is tackled by manually re-checking a random sample of accepted cost lines, among others. There are some drawbacks to this approach though:

1. Audits are conducted two years after actual expenditures, making it difficult or even impossible to (partially) recover rejected costs.
2. Operational and financial audits involve repetitive components, which is not cost-effective and increases the risk of substantive and/or procedural errors.
3. Due to seasonality, not all audits can be performed with available auditors, leading to a significant portion being outsourced. The cost of outsourcing is relatively high, and tasks are often carried out by inexperienced auditors, necessitating time-consuming quality control by the audit team.

Given the recent advances in (Generative) AI, new possibilities open up to tackle these challenges. More specifically, the auditing process (of both FLC and SLC) can be redesigned leveraging AI so that

* Monitoring and checking can be done continuously, allowing rectifications to happen sooner,
* Cost efficiency increases by reducing the repetitive tasks for the control teams.

# Challenge: design and prototype the target auditing solution

In general terms, the goal of this case is to design and prototype an AI-based auditing platform that is able to the current auditing challenges listed in the introduction. To keep things feasible within the Hackathon scope and timing, focus on following aspects of the solution:

## Strategic direction & Business case: is it worth implementing a solution?

You will receive a list of (anonymized) all historical cost lines over a certain time period, with their acceptance or rejection information. A more detailed description of the auditing process will be provided as well. Using this information, potentially together with other information found online, determine whether this approach has a positive business case. Additionally, finetune the strategic direction of the solution: who will gain from this and what are the implications for the functionalities?

Following questions may provide some guidance:

1. Who benefits from the platform: FLC or SLC, or both? Is this setup specific to a single sector / country?
2. Which errors occur most often?
3. What are the expected savings in terms of time and money?
4. What is the expected implementation cost?

## Architecture: what are the key functional capabilities?

Design the high-level architecture for the solution by determining which functional building blocks are needed to translate the raw data (description of cost lines with documents as evidence) to a risk level.

Following questions may provide some guidance:

1. How will you handle the large set of checks, that can potentially grow in the future?
2. How would cases be detected that do not often occur in practice?
3. Is your solution in line with key architectural best practices? (e.g. limit double work, modularity so that components can be swapped)

As a deeper reflection of risk estimation: how would you characterize “risk” of a cost line, and how could this be computed (i.e. which algorithm can be used). What are the advantages and drawbacks of your proposed solution?

## Prototype: how can wrong cost categories be detected?

To make things tangible, zoom in on the specific check for “wrong cost category”. Given the provided information on cost categories, describe how you would approach this check (preprocessing, algorithms, prior knowledge) and implement a prototype. The prototype should be able to ingest cost line data (Excel or csv) and determine the risk for a cost line that the cost category is wrong.

Guiding questions:

1. Given the information available, is every case 100% clear whether the cost line is correct?
2. How should the output of your prototype / model be interpreted? Is this easy for the FLC/SLC to understand?

## Assurance: how to limit materiality of errors?

One key responsibility of the control functions is to ensure that the materiality of errors is limited. From the manufacturing industry, we know that AOQL is sometimes used in quality control of goods. Research and explain if and how AOQL could be used for auditing, given that

1. the goal is to reduce the manual workload of the control functions
2. we know the risk for each cost line (and assume it is correct)