STANDARD WARRANTY DATA MART & PREDICTIVE MODELING OF POTENTIAL OPEN ITEMS

CAPSTONE PROJECT PUBLIC SUMMARY

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The setup

As a leading global medical technology and life sciences company, GE Healthcare provides a broad portfolio of products, solutions, and services used in the diagnosis, treatment, and monitoring of patients and in the development and manufacture of biopharmaceuticals. The products are licensed under a warranty policy, in which the company promises customers to repair or replace certain types of damage to its products within a certain number of days following the sale date.

One of the GE Healthcare Commercial teams' responsibility at the Shared Services Center in Budapest is to accrue expenses that reflect the cost of an estimated amount of warranty claims likely to emerge under the policy. After quarterly closing activities, the Commercial team carries out a reconciliation process, where the goal is to confirm the reliability of the company's accounting records by comparing balances of transactions and creating backups for transactions to be in line with internal and external auditing requirements.

The problem

The Commercial team in GE Healthcare struggled with the current reconciliation process for the Standard Warranty accounts. It was a highly manual, non-standardized, prone to error activity and required constant manual effort to monitor the state of the accounts including open items occasionally appearing which need action from the team.

Open items arise from every posting transaction in a Balance Sheet General Ledger Account in connection with the contract and reflect unfinished business transactions. In practice, it means the given entry doesn't have its counterpart transaction on the Account in line with accounting logic. For example, if an invoice item that has not yet been paid is recorded as an open item in the contract account until it is paid and cleared.

The Capstone project consists of two elements. The first is to create a functioning database for GE's standard warranty processes that consolidates data from various sources and aids team members' work with reconciling warranty accounts. The second is to create a predictive algorithm that can identify protentional open items with source data coming from the database.

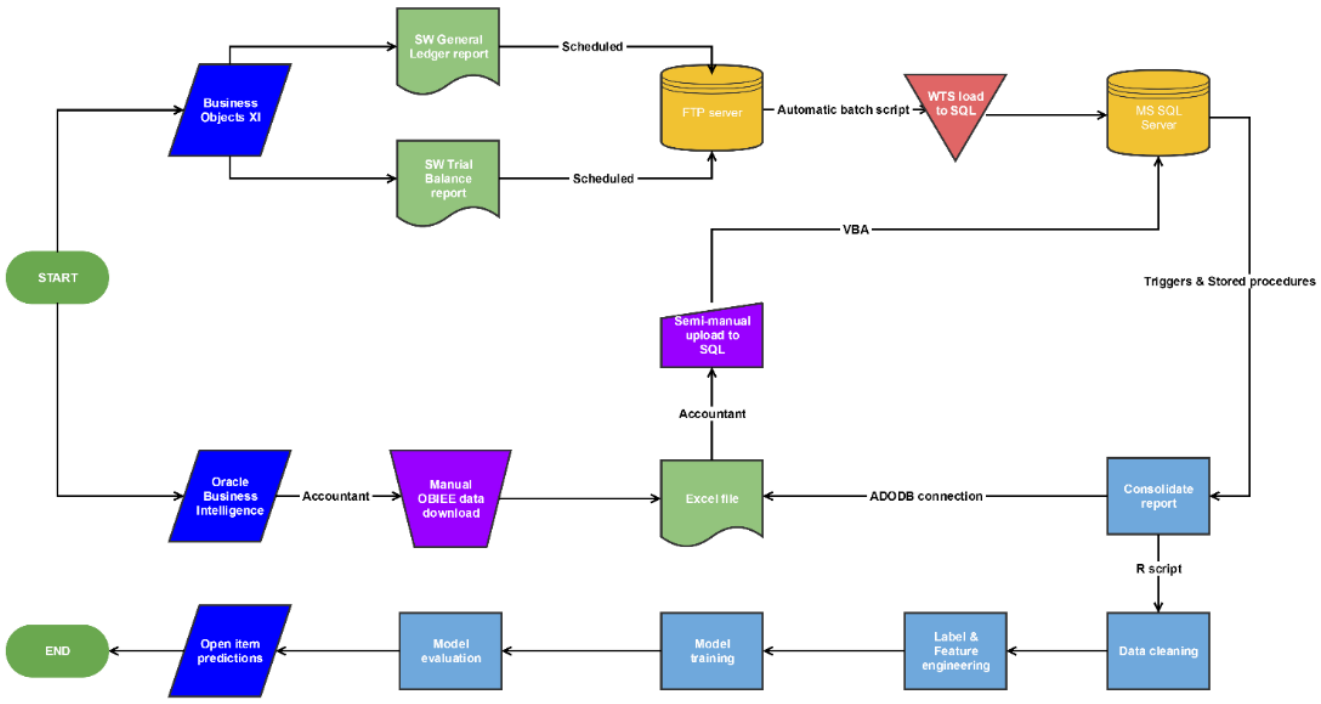
The Methodology

To automate the manual steps, simply the current process and standardize the output, a database was established. It automatically gathers data from different sources. These sources are either order level information (customer name, shipment date, agreed terms …), accounting data (legal entity, account number, accounting date, transactional information …) or manual categorizations coming from accountants (on the topic of actions required, impact, root cause owner …).

After importing the data, automated procedures remove potential errors, combine and create an overall, order level view on the accounts' current state on a daily basis. It maintains a connection with Excel files used by the accountants and provides them enough information to explain balances on the accounts and book corrections/escalate systemic issues when necessary.

Apart from the automation and standardization, a program is used to learn from previous examples and classify accounting lines on these accounts, based on the fact if they should be there or they are a result of a systemic or manual error, and should these balances be cleared or not.

The high-level process can be seen in the flowchart below:



The Result

The new process implemented saves on average 21 hours for the team every quarter. It further provides daily visibility of accounts' status, and around 94% of potential errors can be spotted using the classifying algorithm so that most of the work is not concentrated on the last days of quarter closes (the busiest period for the whole organization). Due to the automatic insertion, cleaning, combining and report creation procedure, accountants do not spend hours preparing their own report manually (which is also very much prone to error), but the processes run on servers before 8 am, and they just need to refresh their Excel files in a matter of seconds to get the most recent view on the accounts.

The Experience

I am already working at the client organization, but this project has been the biggest one so far. The complexity of the database architecture, especially the overall report creation was a big challenge and required me to go beyond my former SQL programming knowledge. Stakeholders were easy to interact with and I received great support from accountants in understanding the financial processes behind the requirements as well.

The data extraction part of the project might desire some better suitable tools such as Knime (instead of standard windows task scheduler and scripts), which is a potential possibility to redesign the process in the future.

This was also the first time I applied machine learning in a corporate environment. Although more data will help the predictive algorithm to be more robust and applicable to other classifications (such as action required to clear an item), stakeholders (and I) are satisfied with the outcome of the project. The next potential step is to evaluate the model on the Q2 items coming in in the next couple of weeks and put the model in production if it meets the expectations.