CENTRAL EUROPEAN UNIVERSITY

Capstone Project Summary: KPIs Dashboard

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This project was executed as my Capstone project in my Master of Business analytics from mid-April to the beginning of June as an internship at the company. This project aimed at building a Dashboard for the Management team of the company and at giving some insight about the technical issues that one Business Unit of this company encounters. During this project, I participated in a complete analytics workflow. Building the dashboard required some analytics, data engineering and analytics management, however the analysis of the technical issues required some data science and visualization.

The company leadership team lacks an extensive view on the health of the operations. The company has multiple business units and every month, the head of each business unit and the management team meet to talk about the performance. To prepare that meeting, the head of each business units download Excel files from their software, load it into Power Bi for visualization and do extensive PowerPoint presentation. This process is time consuming, not efficient and could lead to human error. This process was maintained because nothing else has been put in motion. However, the management team felt that the preparation for those meetings could be optimized and wanted a way to stay aware of the state of each business at all times. This demand was formulated in the late 2019 year to the business analytics team and a dashboard was created. The goal of the dashboard was to summarize some KPIs from the different business units. At the moment, there are 5 KPI in this dashboard from only one business unit. The reason that the dashboard has not been finished in 2 years is that other business units were reluctant to cooperate in his creation because that pushed them to change their habits. Now, with the Covid19 situation, the way they work has changed and another business unit, came back to the advanced analytics team with the demand to pursue the project of a dashboard. The first goal of the project is to add additional KPIs from this business units to complete the dashboard and the second goal is to perform a quick analysis to give an overview about the technical issues that this business unit encounters.

I found the existing dashboard easy to understand but not very efficient to add more KPIs (complicated manipulation), so I decided to create a new dashboard with a better design, show the same information and make the adding of KPIs as easy as possible. The KPI dashboard is a project that will take years to complete, so I needed to be sure that my dashboard could be easy enough that anyone in the Data Factory team could work on it. I wanted to avoid working in such specific ways that all the knowledge about the functioning of the dashboard would have been in my hand and that the next person that will work on it would rather create a new one that trying to understand how mine works (even with a very good documentation).

The main step for this project were:
For the Management KPIs dashboard:

- Lots of meeting to understand how the Data Warehouse was implemented and to understand the new KPIs
- Some data engineering steps to integrate new data to the Data Warehouse
- Data transformation in Power query
- Hours of searching to find the adequate method to build the Power Bi dashboard
- Creation of Calculation groups and new measures
- Recommendations for the pursuit of the project

The final dashboard is automated (directly connected to the Data Warehouse) and easy to understand. I used the feature *Calculation groups*, to ease the process of adding new KPI. I added two new KPIs from the business unit and I also added the 4 KPIs from the previous dashboard.
The management KPIs Dashboard is highly dependent of the Business Units. Indeed, when the project was launched, only one business unit had some clear KPIs defined. During the spring, another came back with their KPIs, so my capstone project was to include them. To avoid a stagnation of the project I recommend to approach: Bottom up and Top down. The Bottom up approach focus on the business need while the Top down approach focus on finishing the dashboard as soon as possible. I recommended the Bottom up approach as I believe it is better in the long run.

If I had more time, I would add some features into the dashboard:

- Rolling 12 months average
- Personalized tooltips with explanation of the KPIs (I spent a lot of time trying to create separate customize tooltip for different parts of the final table but did not find any solutions)

For the quick analysis of technical issues: I analyzed the text description of each case (a case is an issue that the business unit has to solve on a specific machine on a site)

- Extraction of the Data from the Data Warehouse
- Analysis in R (creation of bigrams in tidy text format and words correlation)
- Visualization and interpretation of the results

The text analysis answered the two requests: have an overview of the content of the cases and give a lead to a further analysis concerning the top 5 recurrent issues in different regions.

If I had more time, I would have kept this analysis going deeper. I would have had several more meetings with the Customer Service Technical Expert to gather more information about the issues. I would have started with those 5 top issues and added the site age to my data, to see if I could find any correlation. Maybe looking into maintenance as well: while the machine maintenance is not done by the company, (some site chose to do the maintenance with another company), that could be an interesting lead as well. Lastly, looking into the different aspects of the training on the usage of the machine could explain some more recurrent issues as well.

I believe his project helped me grow as a data Scientist at different levels. Firstly, I was doing this project as an Intern, so I was fully integrated with the team and I participated to team meetings. I learned how an Advance Analytics team works (communication between DS and DE) and how the ETL is implemented at the company. Secondly, it developed my technical skills. I practiced the programming languages that I learned this year (SQL and R) and developed my data analysis skills. I also learned new programs that were not part of the courses (Azure, Power BI, Data factory).