Business Intelligence & Process Management (BIPM)
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SUPER-X Data Warehousing Case Study

Design a Data Mart for the
Procurement / Production Planning / Sales Process
of SUPER-X
(only one process.
Process depends on the group number)

Group 1: Sales
Group 2: Sales
Group 3: Sales
Group 4: Procurement
Group 5: Procurement
Group 6: Production Planning
Group 7: Production Planning

About the Project

SUPER-X's management needs better analyses of the performance of their business processes. Therefore the CIO wants to start a Business Intelligence initiative and create a data warehouse. Particularly for the processes *Sales, Procurement*, and *Production Planning* dedicated data marts should be built. However, the CIO is unsure about the business requirements for these data marts and also the source systems might have data quality problems that need to be analyzed. Also, the CIO is not sure about what data warehouse technologies SUPER-X should use. Part of your project will be to evaluate and compare different technologies based on your proof-of-concept implementations. Because SUPER-X is running at the same time another project about business process management, the top-management wants to get a better data-driven overview of the as-is processes, too. Therefore, also part of your project is the analysis of the process with the help of process intelligence (process mining).

Your Challenge

The CIO of SUPER-X hired you to develop, as a team, a data mart for helping the process improvement initiatives. Your team is responsible to create a data mart especially for analyzing a specific business process *(sales, procurement, or production planning, (depending on your group number))*.

The management wants to get a first start with Business Intelligence. Therefore, it is ok to severely limit the scope of the data mart project. E.g. it is sufficient to have just one fact table in your data mart. The data mart does NOT need to answer all possible business questions for the business process. You should focus on the most important business requirements.

Your consulting contract covers the following parts:

1. Analysis of the business requirements of the data mart, including identifying important KPIs for the data mart
2. Analysis of the relevant data source(s) (i.e. tables in the operational database), including an analysis of the data quality.
3. Multi-dimensional design of the data mart (conceptual design)
4. Proof-of-concept implementations of the multi-dimensional design with two data warehouse technologies of your choice (e.g. Pentaho, SAP HANA, Tableau, Talend, Qlik, SAP Lumira, Microsoft SQL Server, Microsoft Power BI, Oracle, IBM, MicroStrategy, Apache Superset, …)
   4.1. Multidimensional implementation
   4.2. ETL Process
   4.3. Implementation of a dashboard for your data mart that visualizes the KPIs for the business process
   4.4. Evaluation and comparison of the used data warehousing technologies
5. Process Mining based on the event logs of the operational databases (with a tool of your choice, e.g. Disco or ProM)
6. Business recommendations for the management and project reflection

Deliverables

Your project results will be communicated in two ways: 1) a project presentation and 2) a project report.

1) You will present the result of your project as a team in front of the CIO. Your team has 20 minutes time for the presentation and 10 minutes for discussion (in total 30 minutes). You should be prepared to demonstrate your proof-of-concept implementations.

2) The project report describes your results in more detail.

You should bring a printed copy of the presentation and the report to the meeting.

The formal requirement of your printed deliverables:

- For presentation:
  - 2 Slides per page
  - Slides should be numbered
  - Include the filled-out official group presentation form
- For report
  - DIN A4
  - Pages should be numbered
  - Sections should be numbered
  - All tables and figures must have a caption and must be numbered
  - There should be a table of contents and a list of references.
  - There should be NO list of figures, tables, or abbreviations.
  - Reference style should be APA
  - The cover page should include all involved students with their full name and student number
  - In the appendix of the report you should describe the main responsibilities in the project with a table (who did what?). However, the team is responsible also for the complete report.
  - Include the filled-out official group report form
- If possible both the report and the presentation should be printed
  - in color and
  - two-sided
- The printed presentation as well as the printed report should be separately
  - stapled at the left upper corner and
  - hole-punched.
  - NO folders, binders, clips, ring binding, sheet protectors, etc.

Also, a digital copy of the presentation and the report should be uploaded before the meeting to Moodle. The presentation should be uploaded as a source format (e.g. Powerpoint, Keynote) and as a PDF (one slide per page). The report should be uploaded as a PDF.

Cooperation between teams:

- The CIO paid for seven teams. He wants to get different ideas and perspectives. Therefore, it is not ok to copy the ideas and solutions from the other teams. The teams should work independently.
- However, it is ok to help each other with the following issues:
    - Installation and connection problems
    - Other technical problems and roadblocks
    - Specific technical tricks and solutions that are not obvious (please give credit in the report for the team or person who came up with the solution)

Link between Data Warehousing and Business Process Management courses:

- In both courses, you will analyze the SUPER-X Company. In the BPM course the main information sources are humans, in the DW course it is data. You can use the context information gained in the BPM course for the requirements of the data warehouse.
- Expect that you will get conflicting information about SUPER-X in the two courses. One example could be that in the BPM course the CEO tells you about declining sales. However, in the DW course the data might show increasing sales. Then you should assume two different parallel universes: one for the BPM course and one for the DW course. That means in the DW course data is always overruling anything said in the BPM course. In the BPM course human feedback is always overruling anything from the DW course.
  If you see this kind of conflicting information in the two courses, you can mention them in your report in the part about business recommendation or in the appendix.

Evaluation criteria

- Report (80%)
    - 10% Requirement analysis of the data warehouse
    - 10% Analysis of data sources
    - 10% Multidimensional design (conceptual model)
    - 30% Proof-of-concept implementation
    - 10% Process Intelligence
    - 10% Business recommendations
- Presentation (20%)