

# Architecture specification

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Main users of the dashboard divide into two groups:

- Dashboard viewers who are usually supply chain organization employees or other functional department heads
- Dashboard creator or editor, who is BI Analyst.

Main uses for the dashboard:

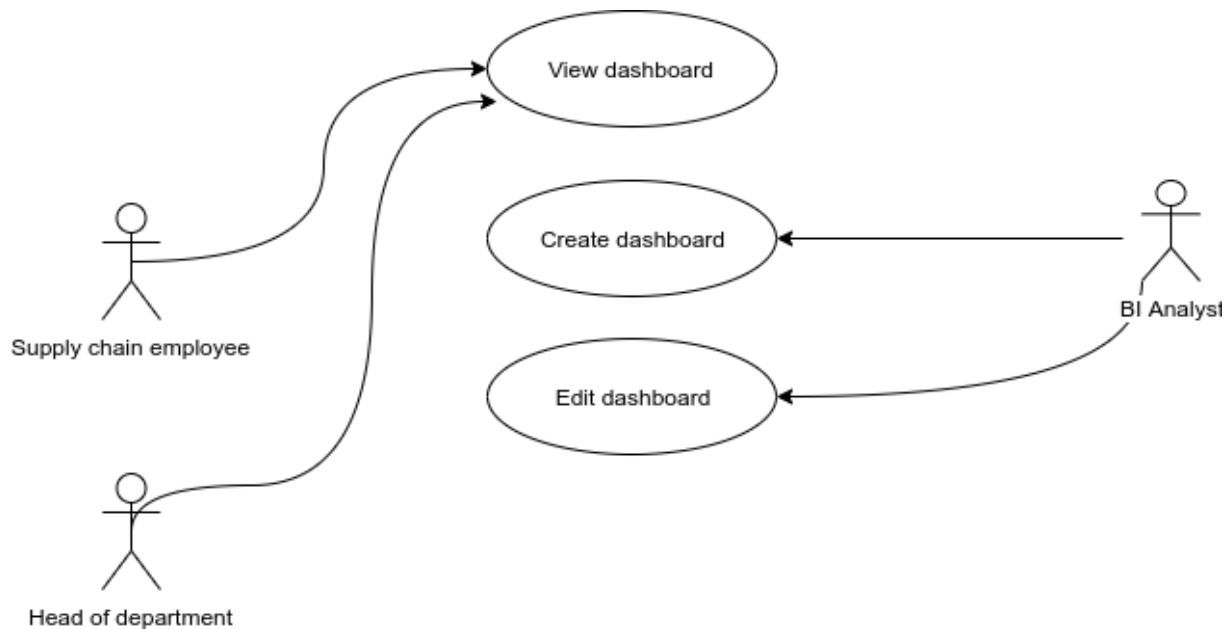
- Performance management
- Results analysis
- Root cause analysis

Performance management includes the checks of current company supply chain performance and if there are any problems affecting the service levels, such as factory breakdowns or other issues in supply chain, like wrong orders sent to customers.

Results analysis includes comparing actual and forecasted performance, to track, manage and improve the operational results.

Root cause analysis can be used to track down which products drove the results and which products were negatively impacting them. Dashboard is particularly useful for this matter due to the possibility of quick dive through into the contribution analysis product by product.

## Use cases



### Use case 1

The supply chain employee can quickly visualize key KPIs from the dashboard to show in company meetings. The dashboard eliminates manual labour, when data is directly drawn from company database. KPIs show where company has performed and where it has improvements to do.

### Use case 2

The head of department has access to the same information as the subordinates, which eliminates information barriers and layers between them. Head of department can quickly see which products are driving the results and perhaps where the bottlenecks or problems arise. The Head of department can also see where the deviances from forecast to sales are, and where the team needs to improve.

### Use case 3

BI analyst creates the dashboard by creating, accessing and structuring the right data needed from company operations and databases. The BI analysts' instructions may come from Head of department or other management team members.

#### Use case 4

BI analyst can edit the data based on Head of department or employees needs and wishes. BI analyst can also proactively propose changes if he or she notices areas for improvements.

### **Description of technical solution**

For building the dashboard we are going to use Microsoft Power BI software. Power BI lets easily to create and publish interactive dashboards. Our dashboard will take data from the connected datasource. Initial scope is to use the already exported data from the database which is in .xlsx format. Future scope is to use the database as a direct data source, this will allow us to show up to date dashboard at all times. In addition to desktop use, Power BI dashboard can also be viewed by mobile app which helps to stay connected wherever business takes you. Following Mobile platforms are supported: Windows, iOS, Android.

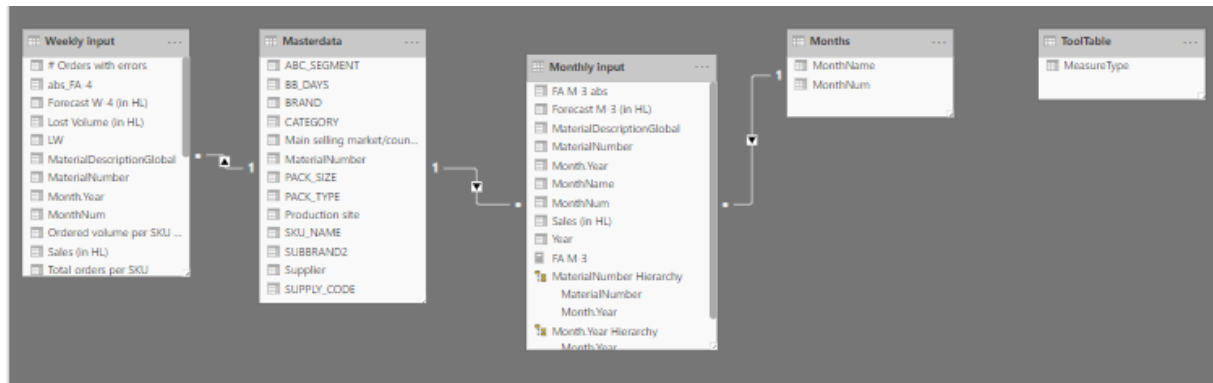
Similar solution could also be done with AWS Quicksight service, but the main decision point to use Microsoft Power BI is the fact that Saku is already using this tool very commonly throughout the company.

## General overview of the architecture



## Datasource

Our existing Excel file contains the following data model



From this data model we need the following main KPI-s. Some of them need to be calculated based on the base data.

- Forecast W-4 (in HL): Shows the accuracy of the forecast, which was made 4 weeks ago for present time
- Sales (in HL): Sales volume of products in hectolitres
- Total orders per SKU: Shows the orders for each stock keeping unit (SKU)
- Ordered volume per SKU (in HL): Shows the volume ordered in hectolitres per each SKU (stock keeping unit)
- Lost Volume (in HL): Shows how much volume was lost in hectolitres
- Orders with errors: Shows the number of orders with errors

KPI-s which need to be calculated from the base data:

- Stock Service Level (SSL) - a measure that indicates performance related to product availability for customers
- Forecast accuracy (FA)
- Under or over forecasting accuracy (BIAS)

**SSL is calculated as follows:**

$$=1-(\text{'Rejected Volume (in HL)' (PO2+PO4)}/\text{'Ordered volume per SKU (in HL)'})$$

**Forecast accuracy is calculated as follows:**

$$=\text{MAX}(1-\text{'FA calc. ABS W-4'}/\text{'Forecast W-4 (in HL)'};0)$$

**BIAS is calculated as follows:**

$$=(\text{'Forecast W-4 (in HL)'}-\text{'Sales (in HL)'})/\text{'Forecast -4 (in HL)'}$$