**ABSTART**: The purpose of this report is to analyse manufacturing data and provide insights and recommendations for improving production efficiency and reducing defects. The data includes information on production runs, quality control tests, and equipment maintenance logs. The analysis was done using SAS software and the findings were visualized using Power BI.

**Data and Assumptions:**

The sample manufacturing data contains information on production runs, including the date, shift, line, product, batch, yield, scrap, rework, cycle time, downtime, and maintenance cost. The data is assumed to be accurate and representative of the production process.

**Key Findings:**

Key Performance Indicators: The following KPIs were identified as relevant to the business goals:

Cycle time

Yield

Scrap rate

Rework rate

Downtime

Maintenance cost

**Charts:**

**Time Series Line Chart**: The trend of the yield, scrap rate, rework rate, cycle time, and downtime over time was visualized using a line chart. The chart showed that the yield and cycle time have improved over time, while the scrap rate, rework rate, and downtime have remained relatively constant.

**Bar Chart**: The yield, scrap rate, rework rate, cycle time, and downtime were compared across different production lines using a bar chart. The chart showed that Line A has the highest yield and lowest scrap rate, while Line C has the highest cycle time and downtime.

**Scatter Plot**: The correlation between yield and cycle time was visualized using a scatter plot. The plot showed a positive correlation between yield and cycle time, indicating that longer cycle times may result in higher yields.

**Recommendations**:

Focus on reducing scrap rate and rework rate: The analysis showed that the scrap rate and rework rate have remained relatively constant over time, indicating a need for improvement in these areas. The company should invest in better quality control measures and equipment maintenance to reduce defects and improve efficiency.

Improve production line performance: The analysis showed that Line A has the highest yield and lowest scrap rate, indicating that this line is the most efficient. The company should investigate ways to replicate the success of Line A in the other production lines.

Monitor cycle time and yield: The analysis showed a positive correlation between cycle time and yield, indicating that longer cycle times may result in higher yields. The company should monitor these KPIs closely and investigate ways to optimize the production process to improve both cycle time and yield.

**Conclusion**:

The analysis of manufacturing data using SAS and Power BI revealed insights and recommendations for improving production efficiency and reducing defects. By focusing on reducing scrap and rework rates, improving production line performance, and monitoring cycle time and yield, the company can achieve its business goals and remain competitive in the market.