Inventory Forecast

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Problem Statement

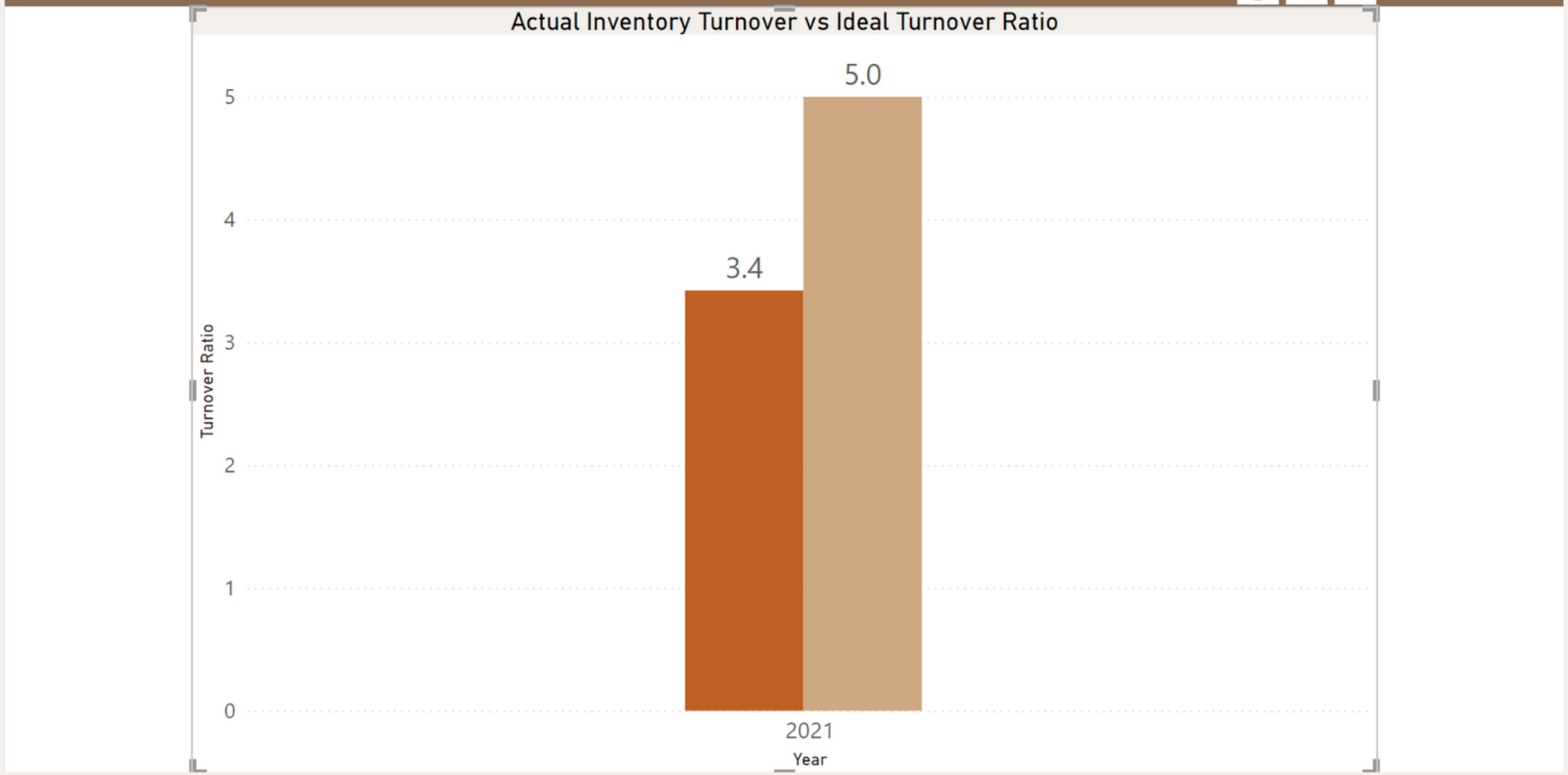
1. INVENTORY FORECAST IS DONE BASED ON GUT FEEL

overstocking	cash being tied up in holding stocks
impedes growth	business is not able to maximise its cashflow on faster moving stocks, marketing, new product launches
over storage	store not efficiently stocked up, dead stocks taking up expensive real estate
affects reputation negatively	high opportunity cost and increase in customer dissatisfaction when products they want are out of stock

2. TASK CANNOT BE HANDED OVER EASILY

Task cannot be handed over easily- ordering **experience is required**

Turnover Ratio



how many times a product or service was sold and replaced within a given timeframe

Power BI

Project Objective:

1. **Accurate inventory forecasting**: inventory based on historical sales, trend and leadtime so to **increase sales** and **turnover ratio**

   - To **improve cash flow** so that fast moving stocks can be sufficiently procured, new product mix can be explored and marketing dollars can be used to promote products that are instock.
   - To better **maximise storage space** with products that have higher turnover (reduce holding cost)
   - To increase **customer satisfaction** by having optimal stocks available for purchase

2. To **automate** the current process so that task can be completed based on science, **allowing handover**

Data Required

SKU	MINIMUM COVERAGE
OPENING INVENTORY	MAXIMUM COVERAGE
DEMAND	
SUPPLY	
PERIOD	

Data to obtain from function

CALCULATED COVERAGE IN PERIOD	NUMBER OF MONTHS BEFORE STOCKS RUN OUT, BASED ON UPCOMING DEMAND
PROJECTED INVENTORIES IN QTY	INVENTORY NEEDED TO FULFILL FUTURE ORDERS
SAFETY STOCKS	EXTRA STOCKS THAT PREVENT STOCKOUT
MAXIMUM STOCKS	MAXIMUM STOCKS BEFORE OVERSTOCKING
PI INDEX	OK, ALERT, SHORTAGE, OVERSTOCKS
RATIO PI VS MIN	RATIO [PROJECTED INVENTORIES] VS. [MINIMUM STOCKS TARGET]
RATIO PI VS MAX	RATIO [PROJECTED INVENTORIES] VS. [MAXIMUM STOCKS TARGET]

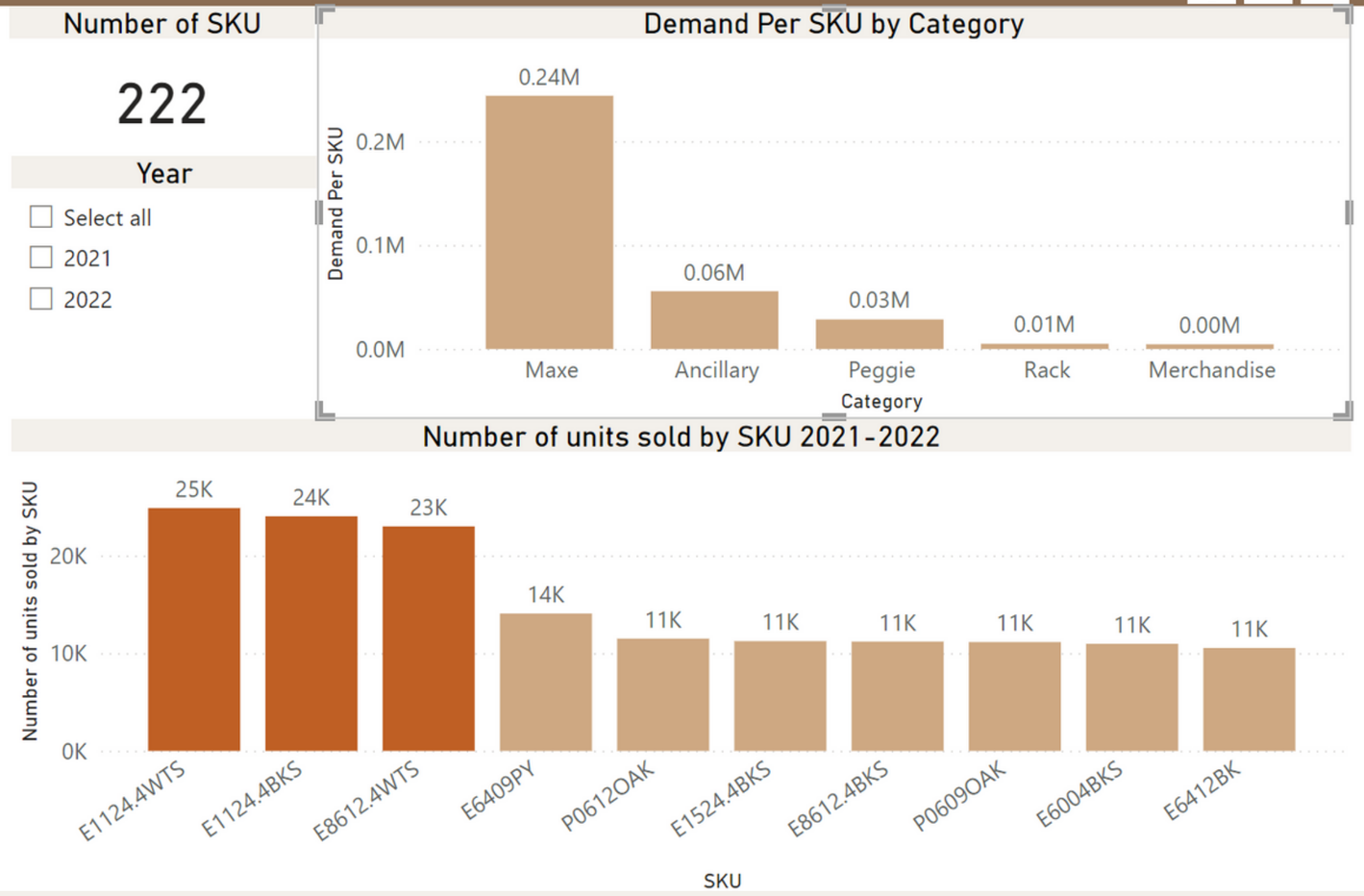
Data Cleaning Process

RAW DATA TO PRELIMINARY DATA	EXCEL	PULL OUT THE REQUIRED FIELDS NEEDED
DATA CLEANING	R	PACKAGE USED: READR DPLYR LUBRIDATE ENSURE PERIOD IS IN DATE CLASS CHECK FOR NULL AND REPLACE WITH 0

EDA

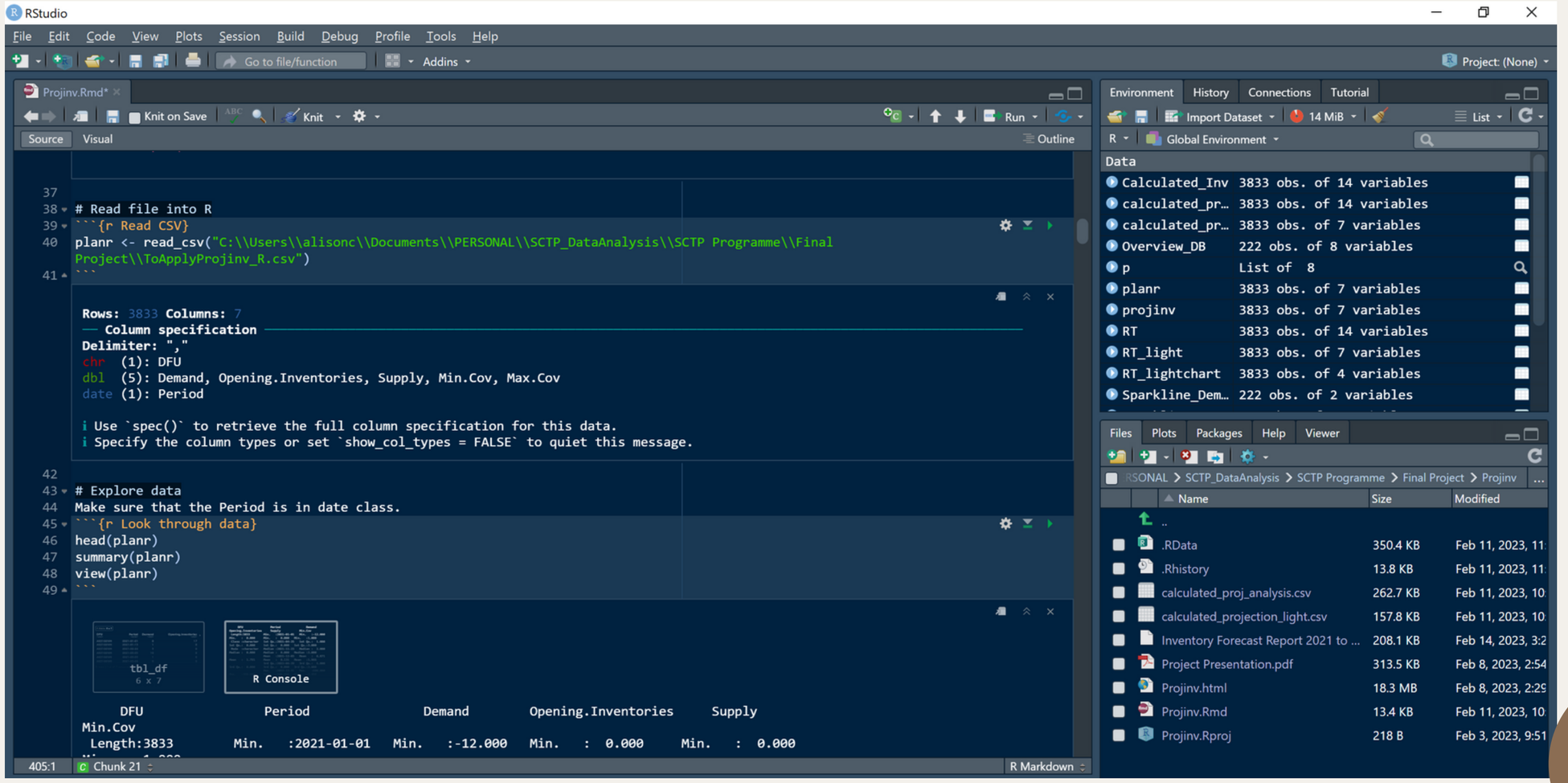
CALCULATE COVERAGE IN PERIODS AND PROJECTED INVENTORIES	R	PACKAGE USED: PLANR FUNCTION: LIGHT_PROJ_INV
VISUALIZATION: CREATE A REACTABLE TABLE AND HIGH CHART FOR AN OVERALL VIEW OF THE INFO	R	PACKAGE USED: TIBBLE REACTABLE HIGHCHARTER
ANALYSE VALUES OF PROJECTED INVENTORIES AND COVERAGE	R	PACKAGE USED: PLANR FUNCTION: PROJ_INV
VISUALIZATION: CREATE A REACTABLE TABLE AND HIGH CHART FOR AN OVERALL VIEW OF THE INFO	R	PACKAGE USED: TIBBLE REACTABLE HIGHCHARTER

SKU Analysis



Power BI

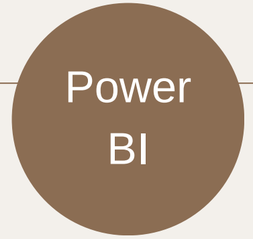
R Studio– Apply planr function to E1124.4WTS



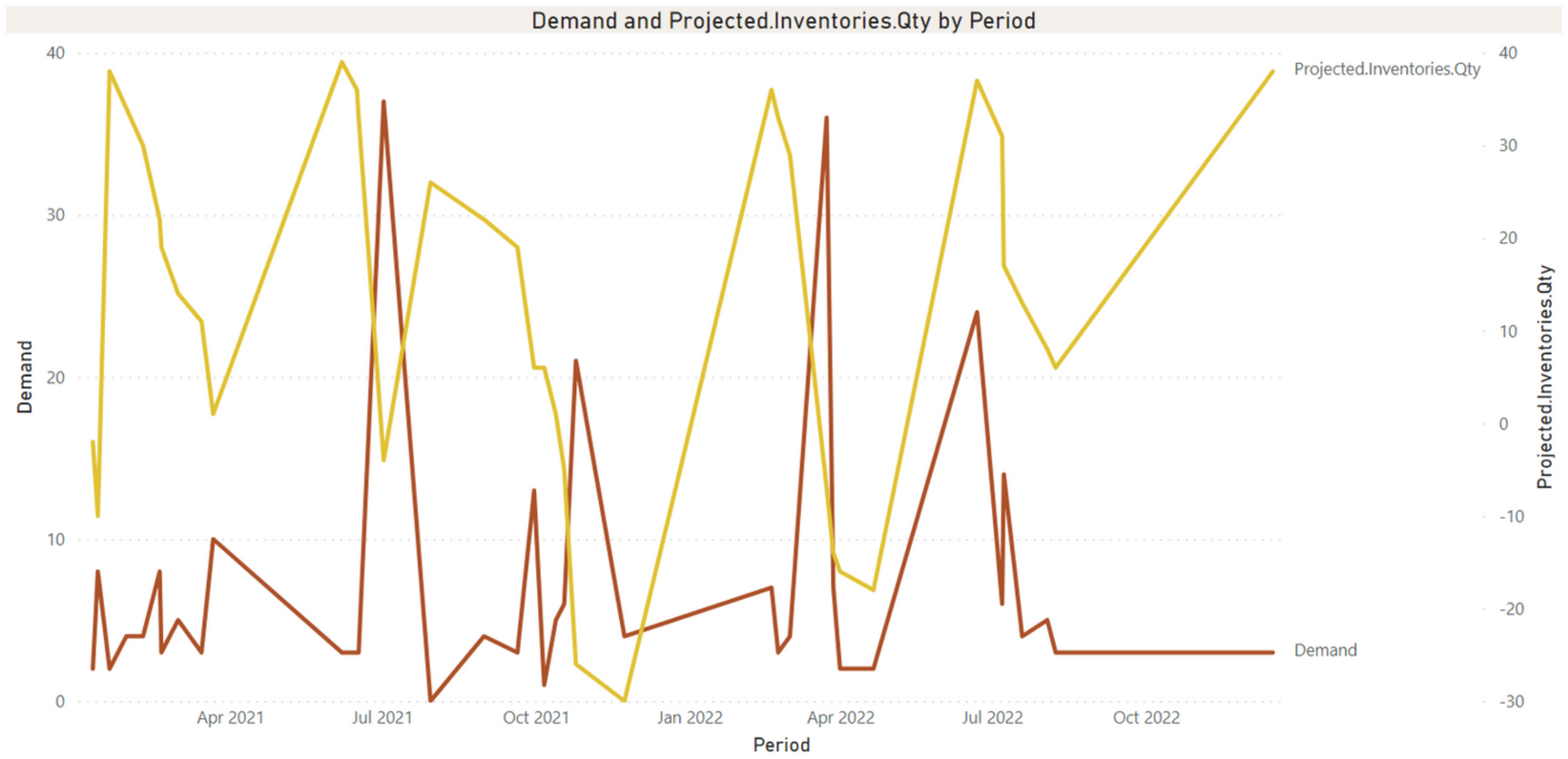
R Studio

Data Visualisation in Power BI

EXPORT DATA FROM R	R	FUNCTION: WRITE.CSV
IMPORT CSV INTO POWER BI	POWER BI	



Projected vs Demand



Conclusion

From the analysis, I can see that the **projected inventory** VS **actual demand fits in certain periods** using the **function planr** in R Studio. With more data and further analysis of the function, we can potentially increase the accuracy of stock order and to increase the turnover ratio.

The function allows the tabulation of safety stocks, maximum stocks, reorder quantities and generates the indexes when the SKU is in the "Alert", "Shortage", "Overstocked" statuses with just a line of code. This **saves us time** and **increases accuracy**. And from there we can make adjustment to the numbers based on gut feel towards the end. This process can then be **handed over to another person** easier and they can get better at it over time.

Q & A

Epilogue

In this project, I wanted to focus on improving inventory forecasting, which is a real problem I encounter on a daily basis. Through research, I was able to apply functions like the planr package, lubridate, reactable and high charts into the project, which are not taught in the programme.

This process has encouraged me to be a self-learner and push myself to experiment different softwares and functions required to reach my end goal.