KEY PERFORMANCE

6/18/2018 — 6/22/2018

Line: All

Team: All

Machine Utilization
90.57%

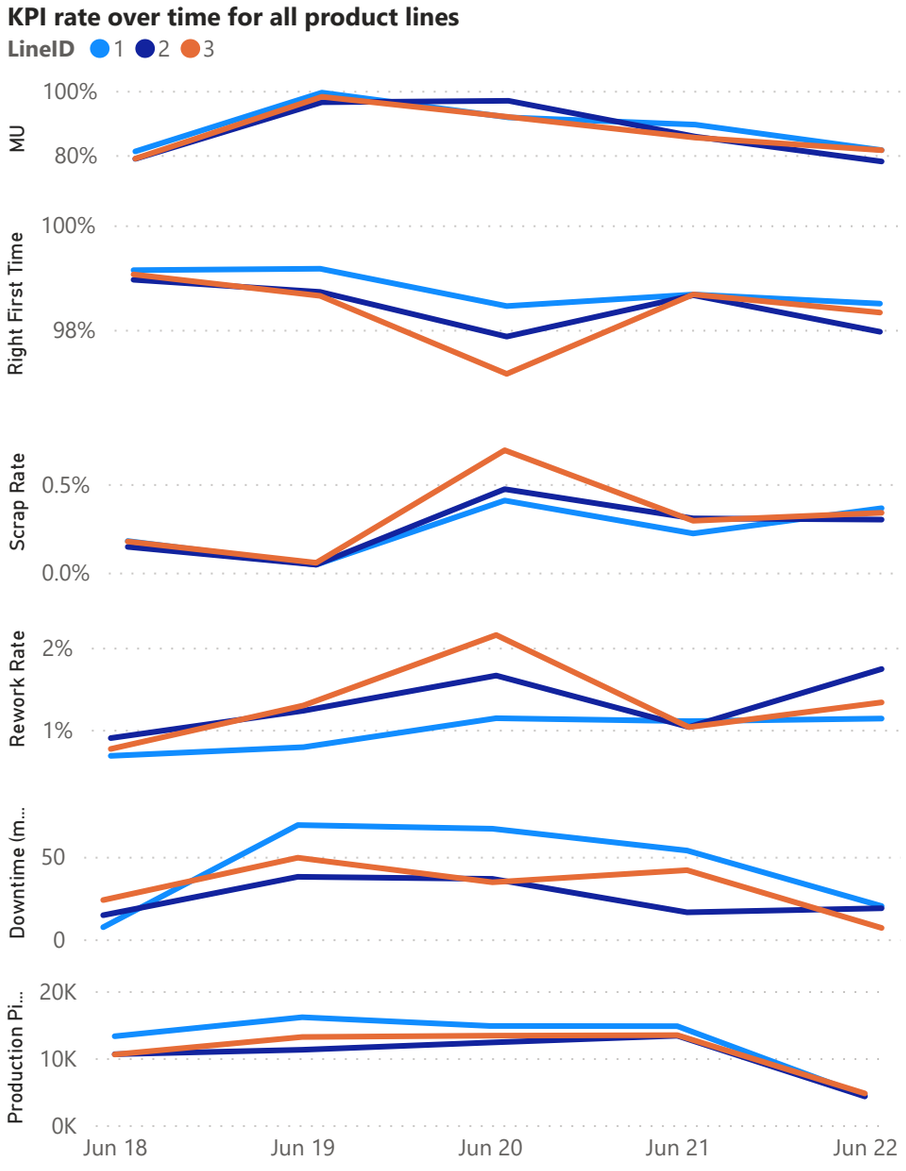
Right First Time
98.79%

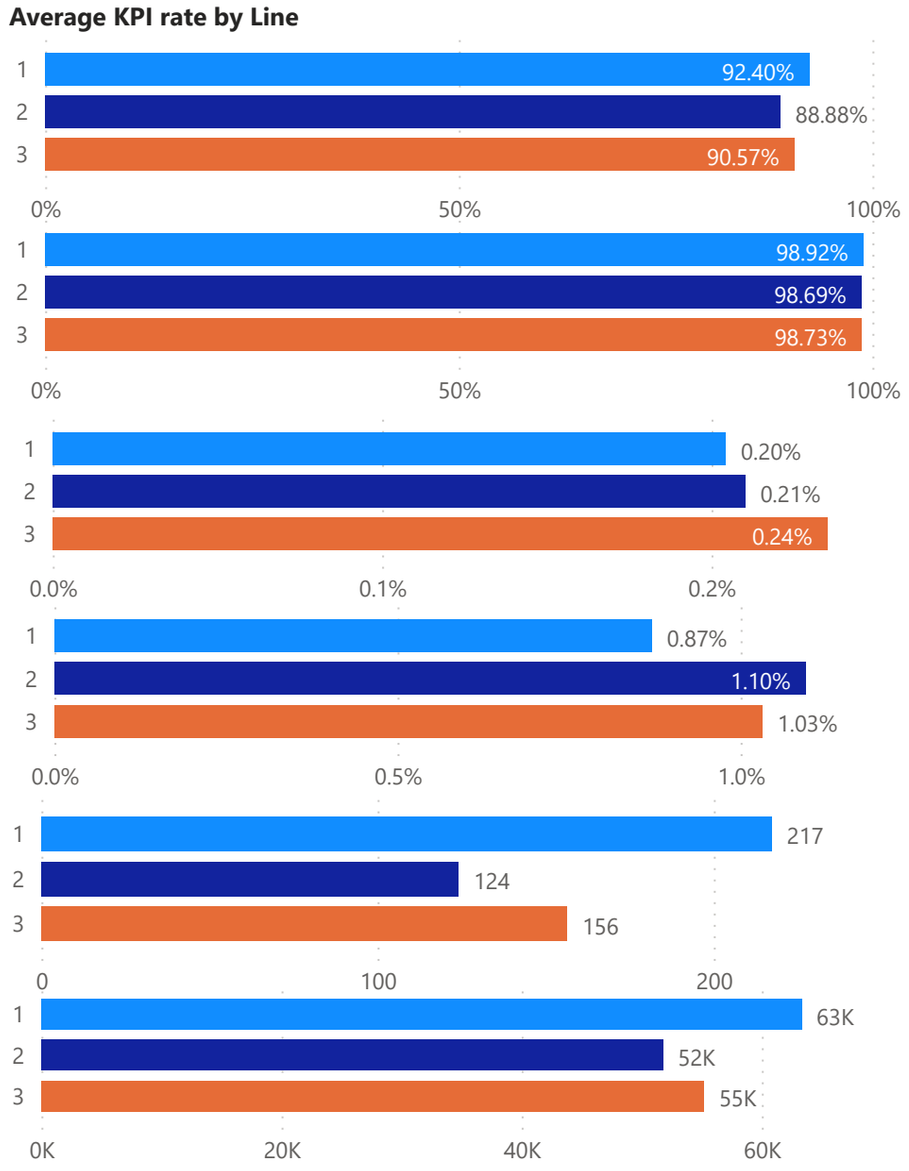
Scrap Rate
0.22%

Rework Rate
0.99%

Total Downtime Mins
497.75

Total Production Pieces
170.27K





ANALYSIS INSIGHTS

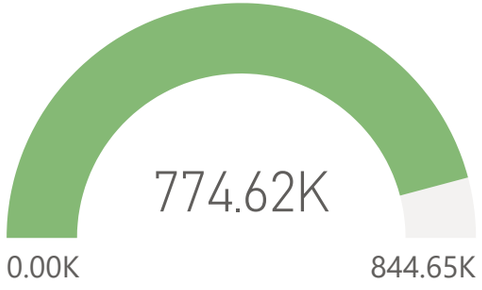
6/18/2018 – 6/22/2018

Line: All

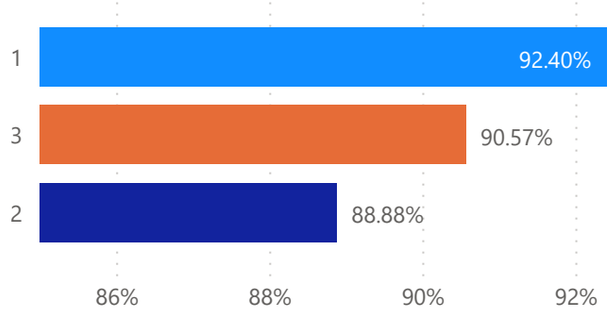
Team: All

Machine Utilization	Right First Time	Scrap Rate	Rework Rate	Total Downtime Mins	Total Production Pieces
90.57%	98.79%	0.22%	0.99%	497.75	170.27K

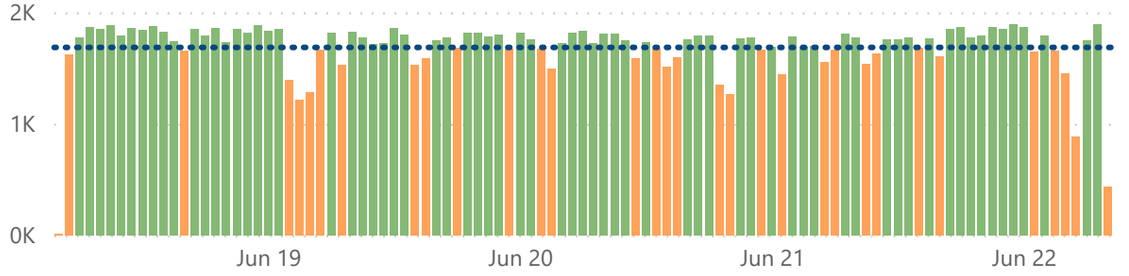
Are we meeting the Predicted Production?



Which Line has the best machine utilization?



Are we meeting the Average Items produced by Hour?

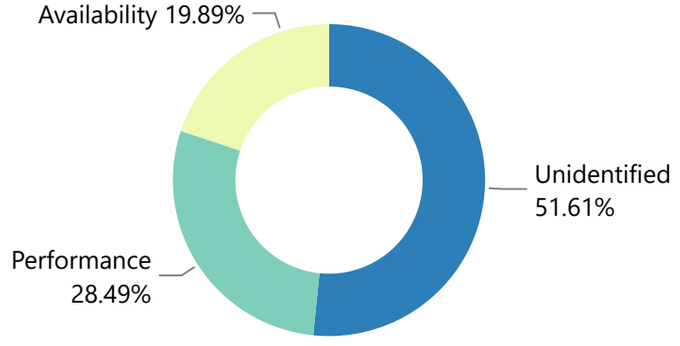


Summary by Line and Team

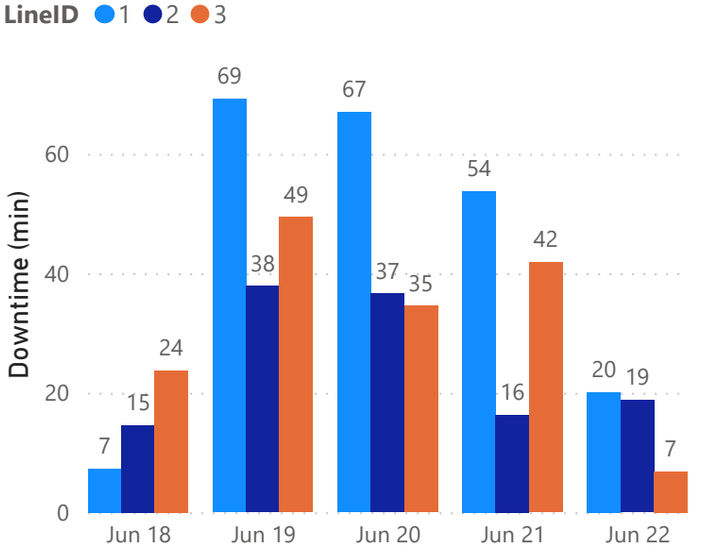
Line 1, Team 1		
92.28% MU	20247.00 Production Pieces	60.60 Downtime (min)
Line 1, Team 2		
93.61% MU	22600.00 Production Pieces	94.43 Downtime (min)
Line 1, Team 3		
91.21% MU	20465.00 Production Pieces	62.25 Downtime (min)
Line 2, Team 1		
88.13% MU	17147.00 Production Pieces	35.18 Downtime (min)
Line 2, Team 2		
90.44% MU	21858.00 Production Pieces	41.88 Downtime (min)

Total No. of Downtime	Longest Downtime (mins)
186	29.55

What are the Downtime Categories?



Which Line suffers the Worst Downtime?



BONUS: CORRELATION

6/18/2018 — 6/22/2018

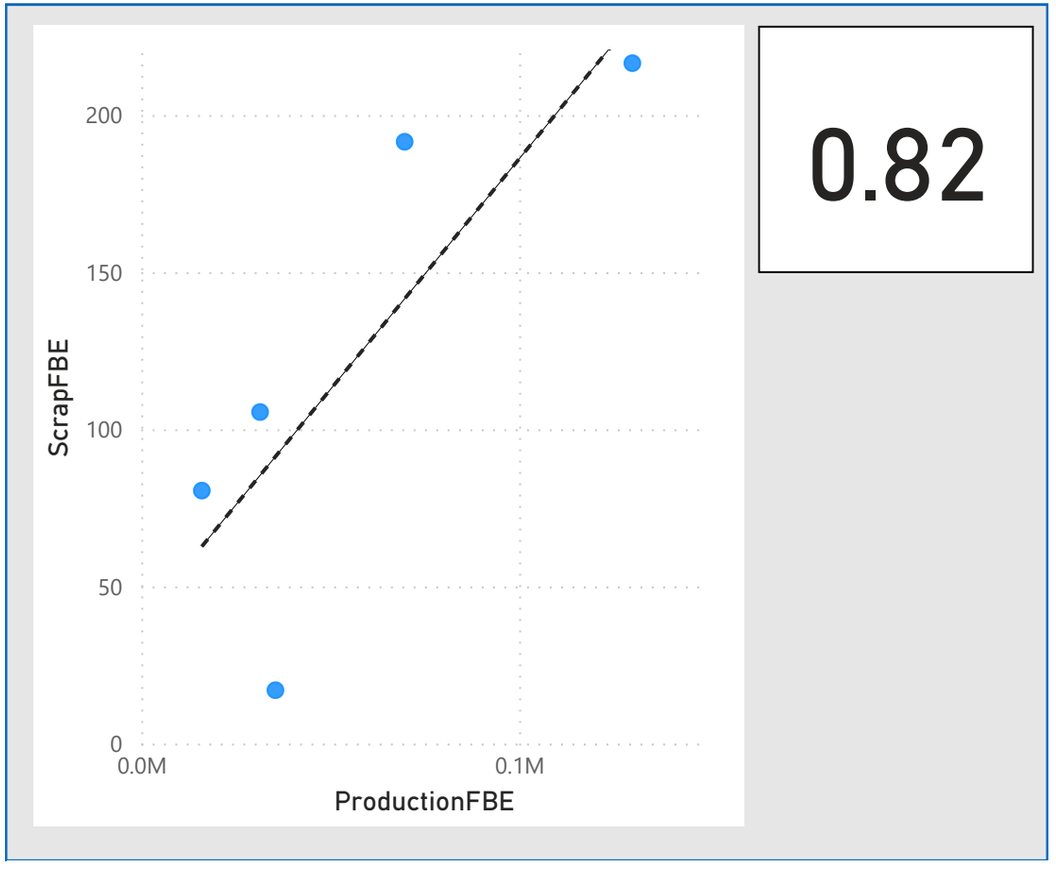
Line: All

Team: All

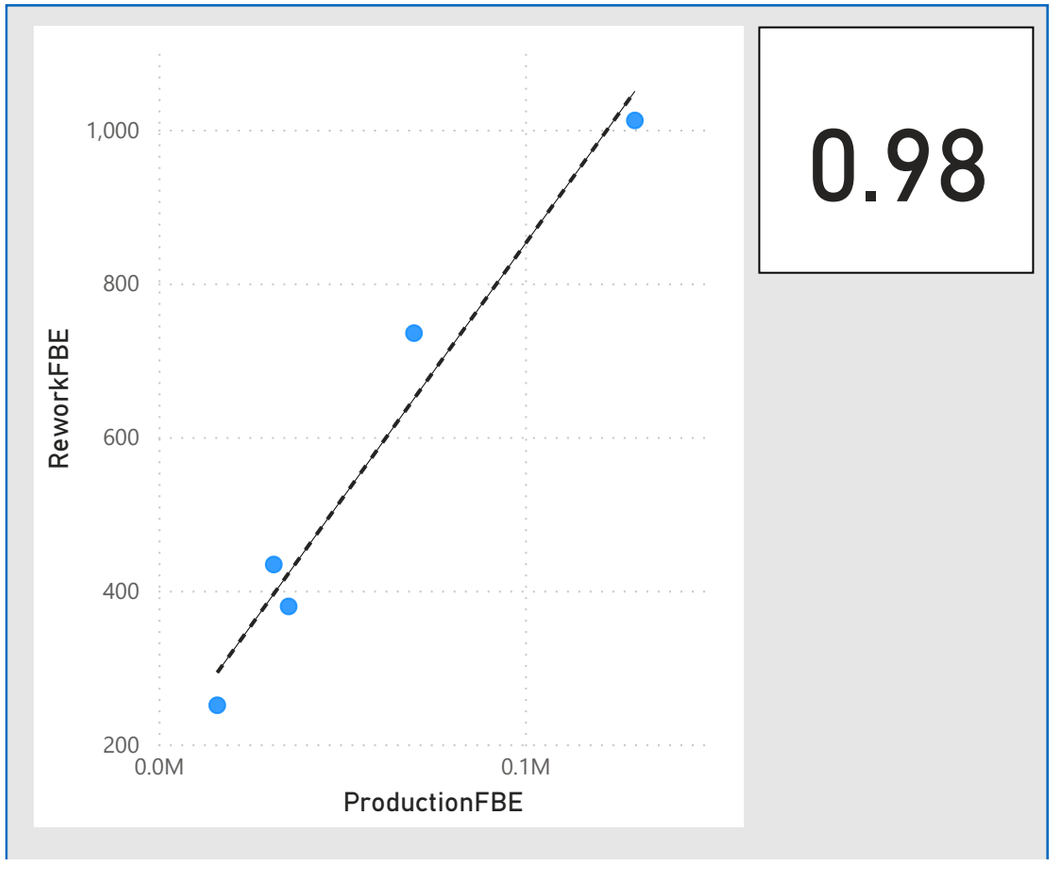
Bonus Question:

Is there a correlation between (i) total production and scrap pieces produced, (ii) total production and rework pieces? What is the magnitude of correlation?

Correlation between total production and scrap pieces



Correlation between total production and rework pieces



Answer: Yes, there is a correlation between the total production and scrap pieces produced and total production and rework pieces. However correlation does not imply causation. Why there are more scrap and rework when more items produced could be due to several reasons: machine malfunction, human error, poor quality materials, etc. Magnitude of correlation for (i) 0.82 (ii) 0.98

Assumptions
- Null values to be left alone except for Breakdown Name/Type
- Each line has the same potential output/productivity
- Breakdown Name/Type null values to be replaced as **'Unidentified'** and **'U'**
- Table **DBMachineUtilization1** to be used as the base table that will be linked together tables when managing relationships

Changes Made to Datasets
ShiftID: removed as it's null across all datasets
LineTeamDateID created as common ID to use in table relationships and sync slicers
Date col contains date
Time col contains time
Datetime col contain date and time

Measure Formulas
Machine Utilization
Machine Utilization KPI = DIVIDE(SUM(DBMachineUtilization1[ProductionFBE]) - SUM(DBMachineUtilization1[ScrapFBE]), SUM(DBMachineUtilization1[ProductionFBETheoretical]))
RETURN IF(Machine Utilization KPI > 1.0, 0.9*Machine Utilization KPI, Machine Utilization KPI)

Right first time
Right first time = DIVIDE(SUM(DBRightFirstTime[ProductionFBE])-SUM(DBRightFirstTime[ReworkFBE])-SUM(DBRightFirstTime[ScrapFBE]),SUM(DBRightFirstTime[ProductionFBE]))

Scrap rate
Scrap rate = DIVIDE(SUM(DBRightFirstTime[ScrapFBE]),(SUM(DBRightFirstTime[ProductionFBE])))

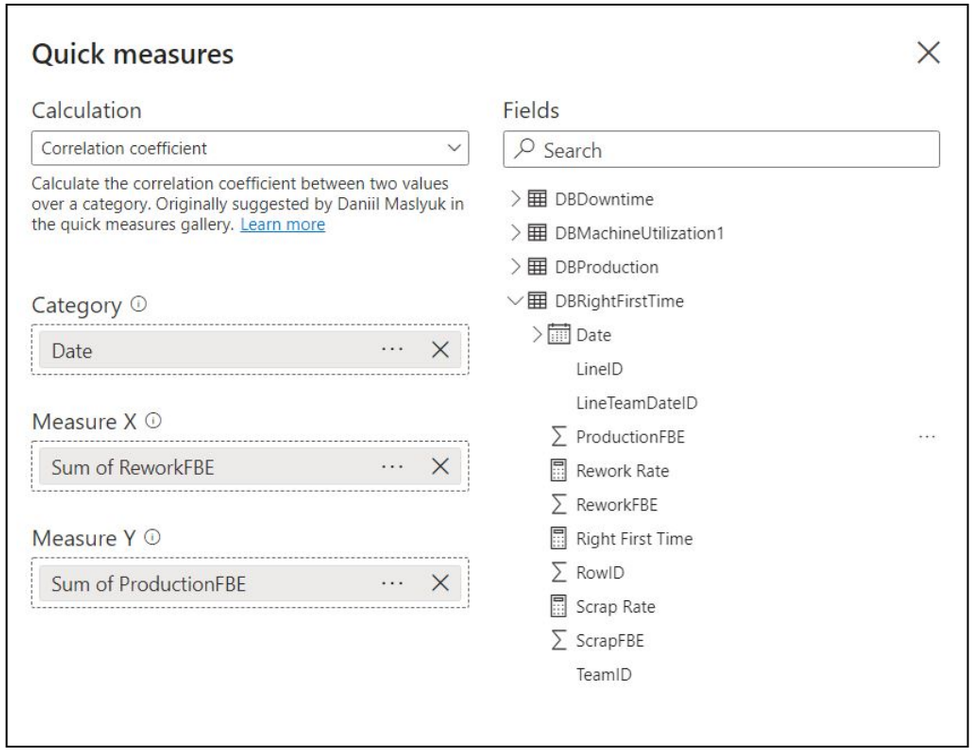
Rework rate
Rework rate = DIVIDE(SUM(DBRightFirstTime[ReworkFBE]),SUM(DBRightFirstTime[ProductionFBE]))

Downtime (min)
SUM(DBDowntime[Downtime (sec)])/60

Total Production pieces/Volume
Production Pieces = COUNT(DBProduction[Item])

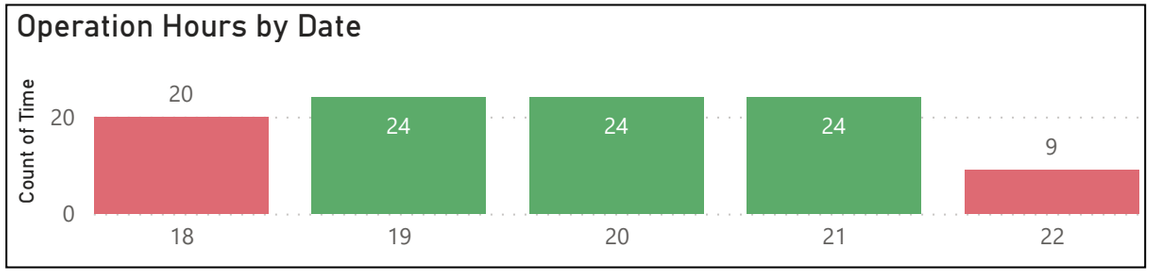
Bonus
- Correlation score was created using quick measure while scatter plot was used for visualization.
- Data was aggravated by date as there are null values when aggravated by rowID.

Date	ProductionFBE	ReworkFBE	ScrapFBE
18/06/2018	129,961.65	1,012.00	216.50
19/06/2018	35,495.12	379.48	17.00
20/06/2018	16,013.12	250.83	80.50
21/06/2018	69,691.80	735.18	191.50
22/06/2018	31,431.88	434.00	105.50
Total	**282,593.57**	**2,811.49**	**611.00**



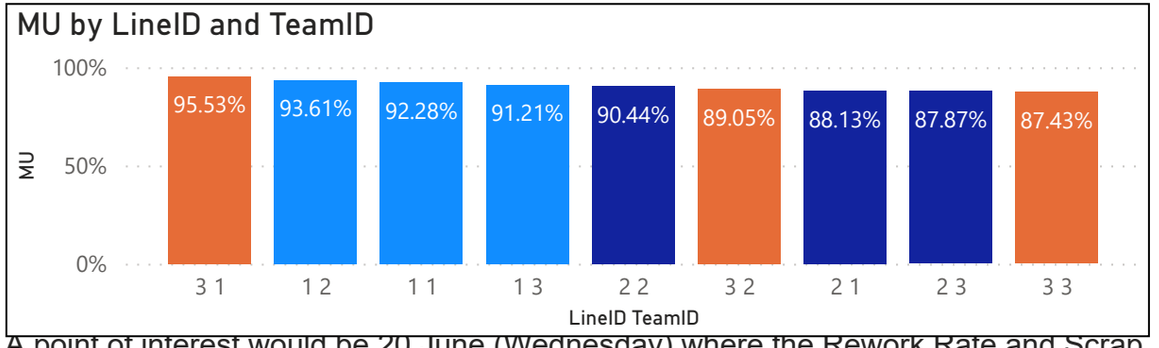
Observations

- 18 June (Monday) and 22 June (Friday) were not 24 hours operational

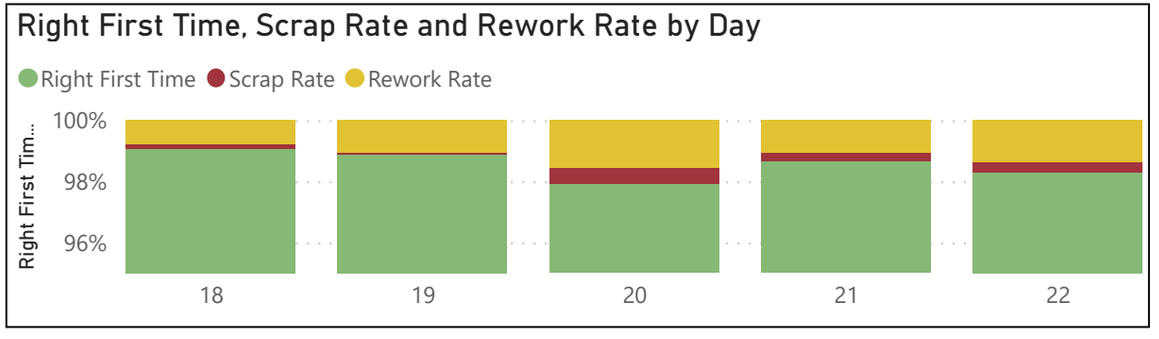


- Although the overall Machine Utilization KPI exceeds 90%, Line 2 overall KPI falls below 90% due to the line's Team 1 and 3.

-There's a total of 4 teams whose Machine Utilization KPI fall below the 90%. They are Team 1 and 3 from Line 2 and Team 2 and 3 from Line 3



- A point of interest would be 20 June (Wednesday) where the Rework Rate and Scrap Rate increased causing a small dip in Right First Time. While the drop is small, it'd be worth looking into if it happens on every Wednesday.



- 51.6% of the downtime is not identified. They should be looked into and documented as it will give a more accurate outlook on whether the downtime falls under performance, availability or another underlying issue.