Open Pit Mining

Supply Chain Analytics (DA) - Capstone Project

BHUVANESH KUMAR J

Agenda

- Objective
- Background
- Key Findings
- Recommendations
- Appendix:

1. Data Sources
2. Data Methodology
3. Data Model Assumptions

Background

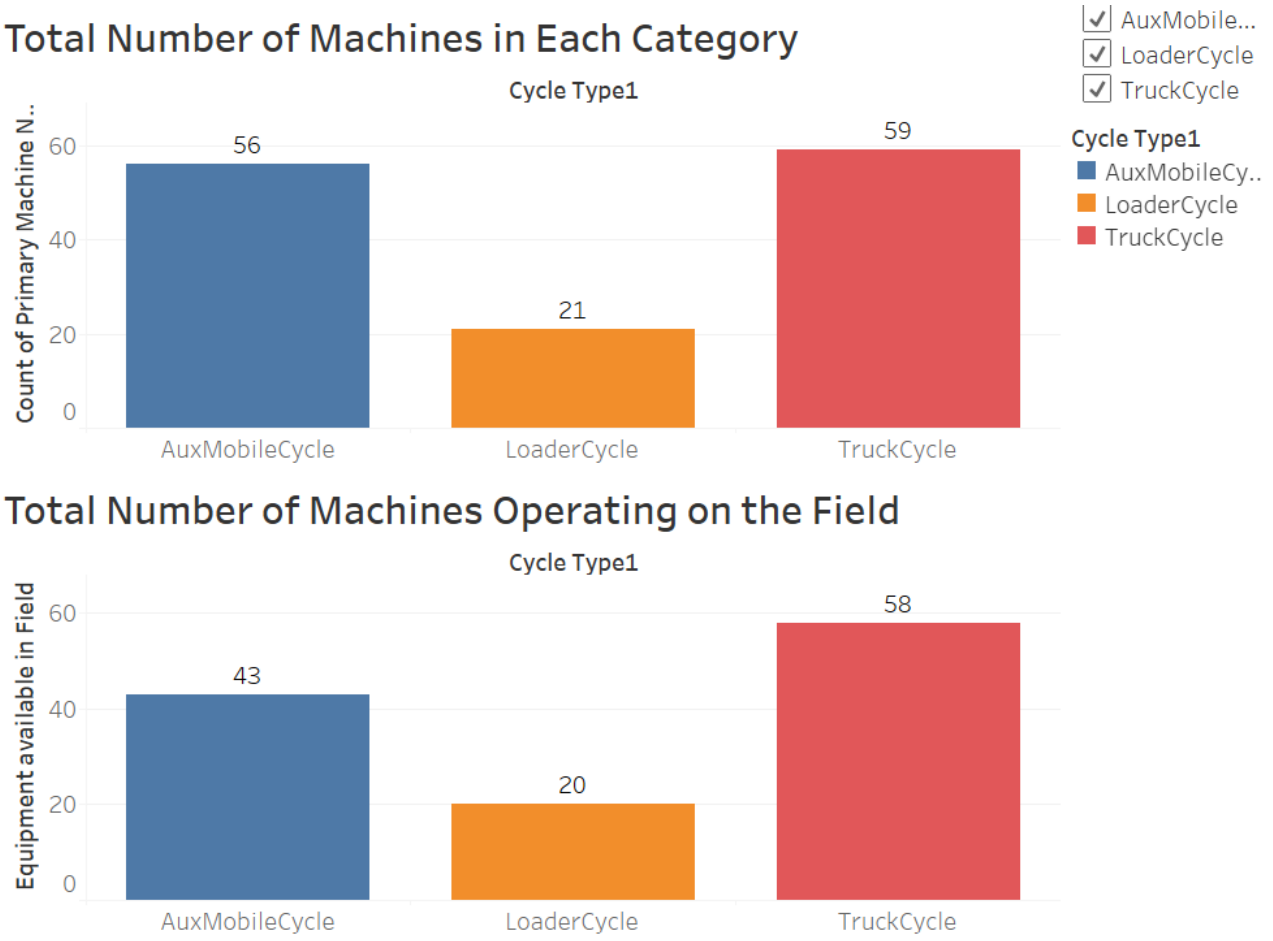
- The open-pit mine is facing problems of inefficient production and is losing customers' trust as they are not able to meet their demands even though there has been no surge in demand.
- The mine has operations such as the digging of ore and crushing of ore into a finer composition where this ore gets transported between the diggers and crushers using transportation trucks.
- Need to build a smart live monitoring system and need to understand the key metrics explained by the client.

Objective

- To Show the Key Metrics Obtained such as
  - Equipment Availability,
  - Production Rates and
  - Efficiency of Operations
- Provide Suitable Recommendations to meet the demand
- To Explain Data Sources and Overall Data Methodology Followed.

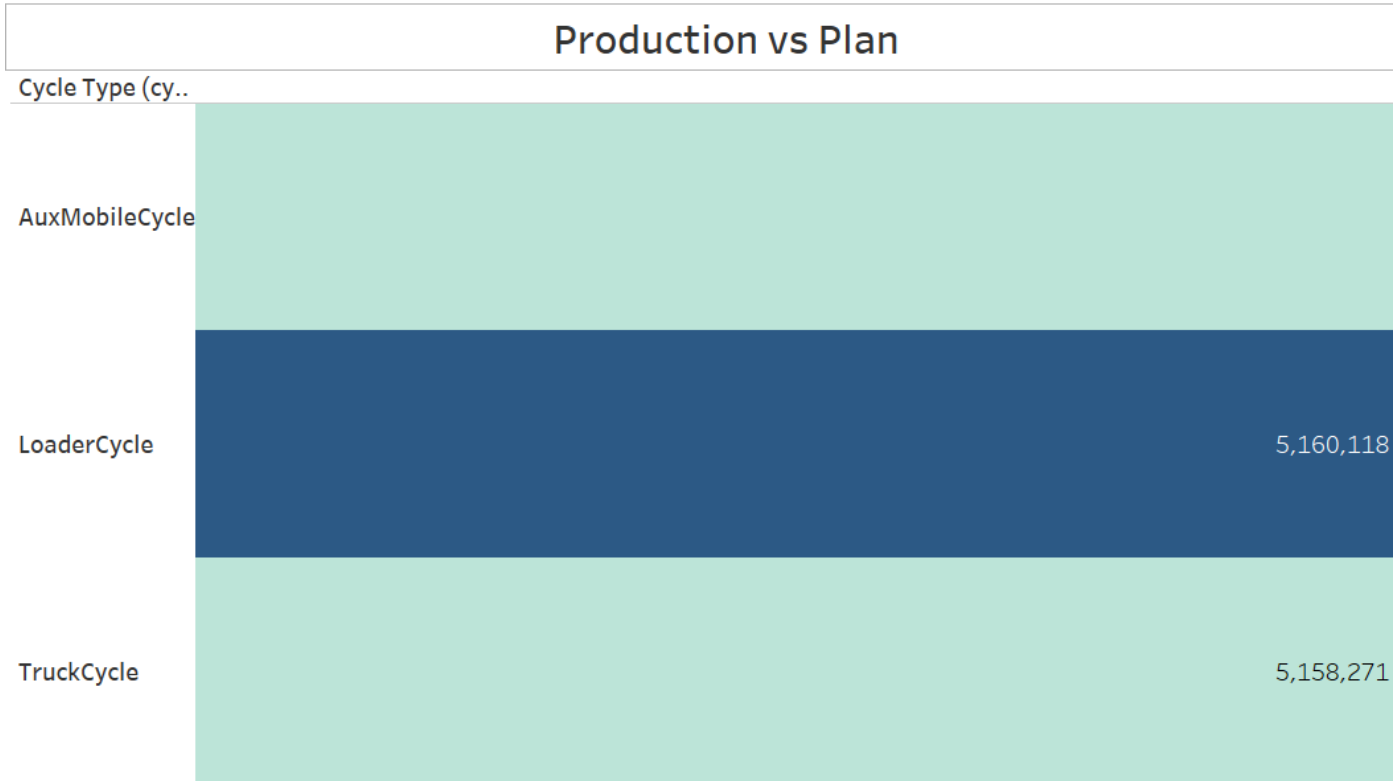
Equipment Availability

- There are total 136 equipments across all the class types and Truck Cycle holds the highest number of equipments
- There were only 121 number of equipments actually working on the mine field.
- Hence 15 number of equipments are under Maintenance, out of which 13 AuxMobile class type equipments are under these category.



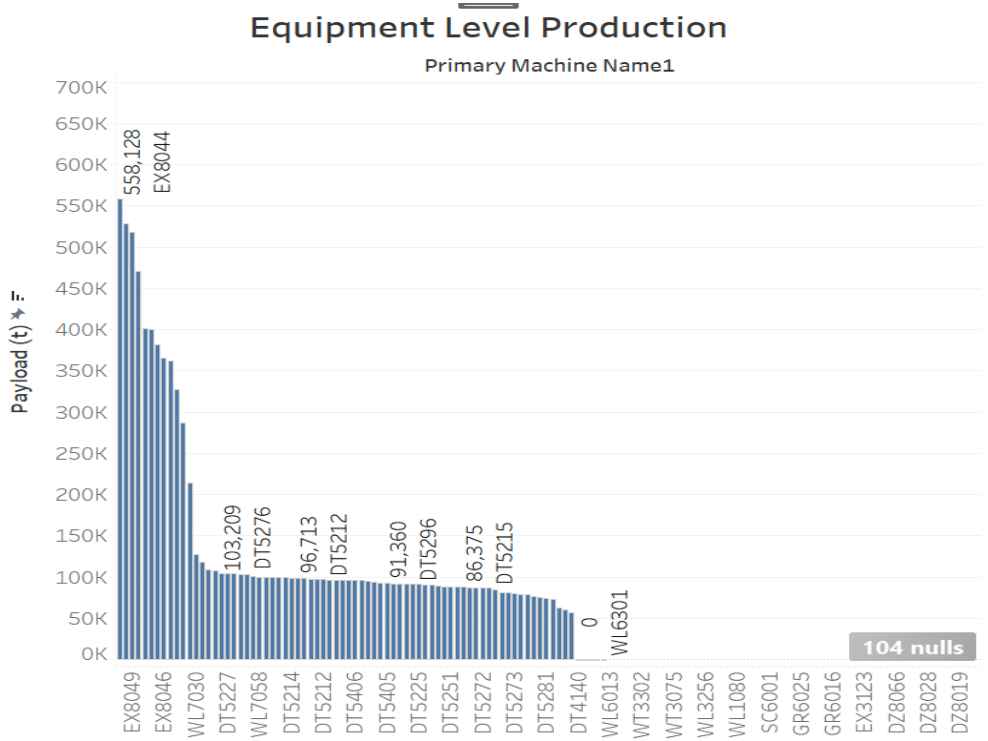
Production Rates

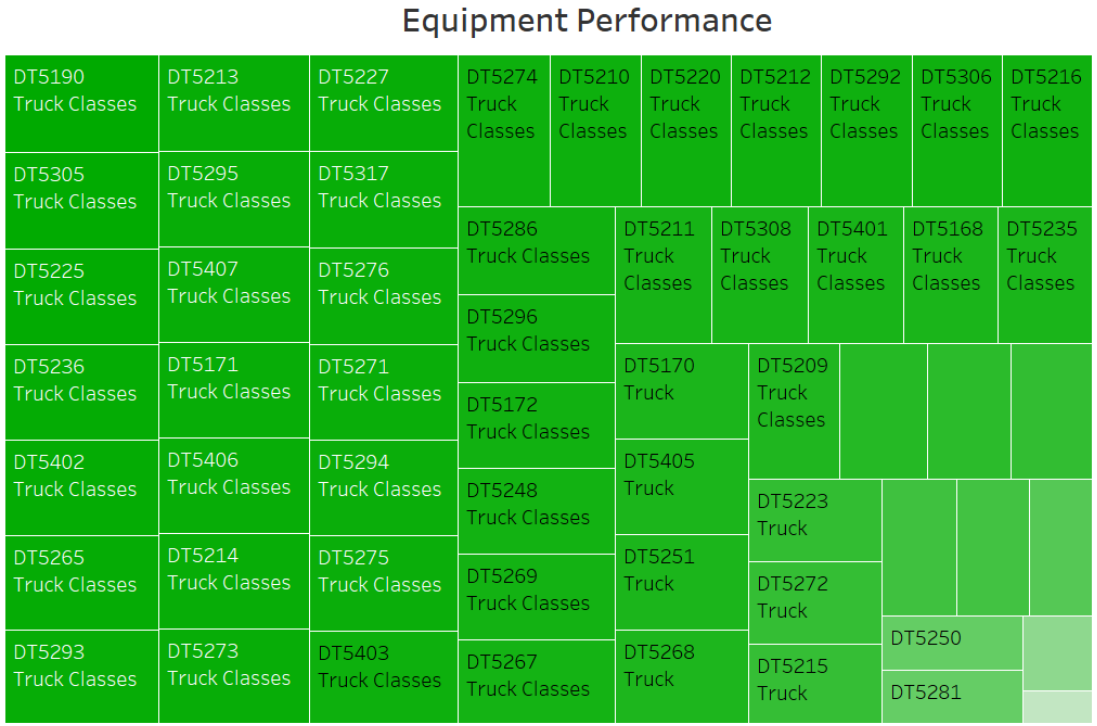
- There is a sum difference in Payload between actual production and plan i.e 1847 Tons.



Production Rates

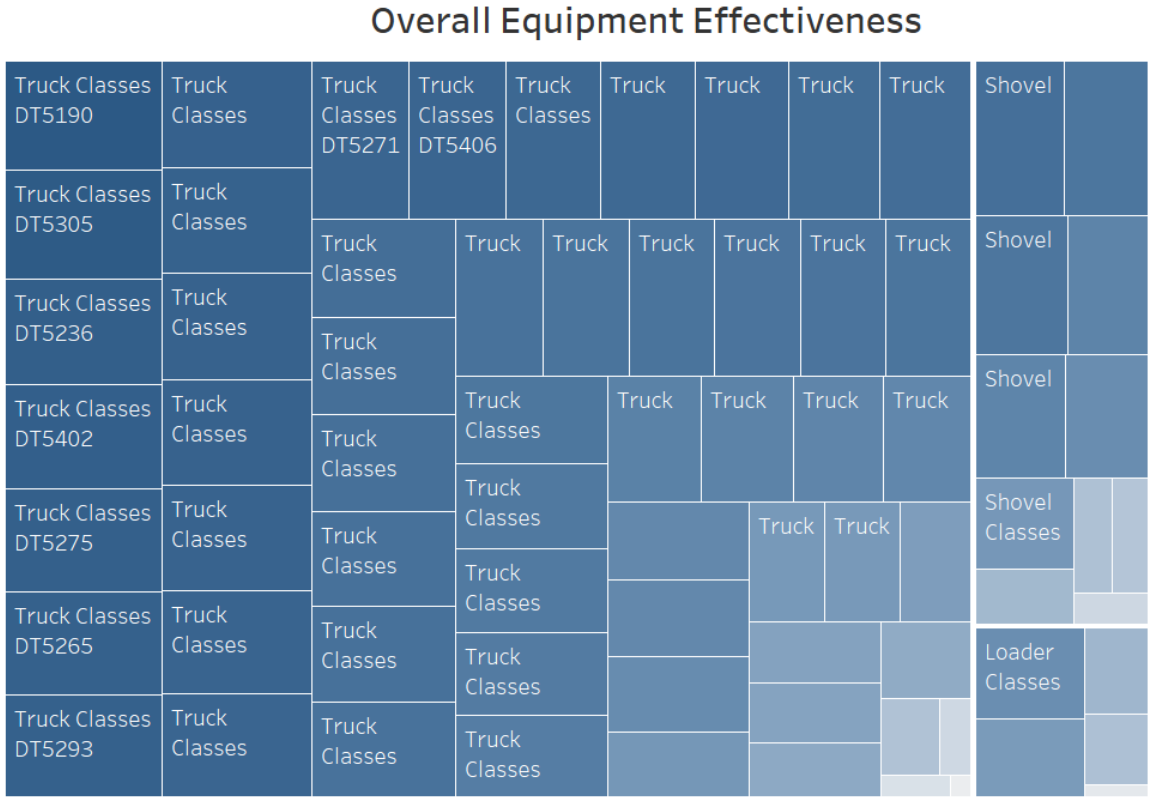
- Top Performing Equipments under production are Shovel Classes
- Poorly Performing Equipments under production are Loader Classes





Efficiency Of Operations

- Considering the overall efficiency the Truck Class overcomes all other classes
- Since AuxMobile Classes do not take part in production it becomes the least efficient



Recommendation

- The Loader Class which takes major part in production has some defect equipments like EX5108, WL6011 etc. needs to be taken care of.
- The Truck Class equipments which covers less distance with more fuel should be taken care.
- The AuxMobile Class have the highest defect equipments needs to be taken care of.

Appendix – Data Methodology

- First the Dataset was loaded in python where the tables were cleaned and created the combined tables cycle, movement and delay tables.
- Those three tables were loaded into MySQL with Username: root and Password: **Bhuvanesh** .After Loading we created a stored procedure for each table and OEE table also
- Then with Tableau we connected the cleaned table to form suitable charts and derive key insights