



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

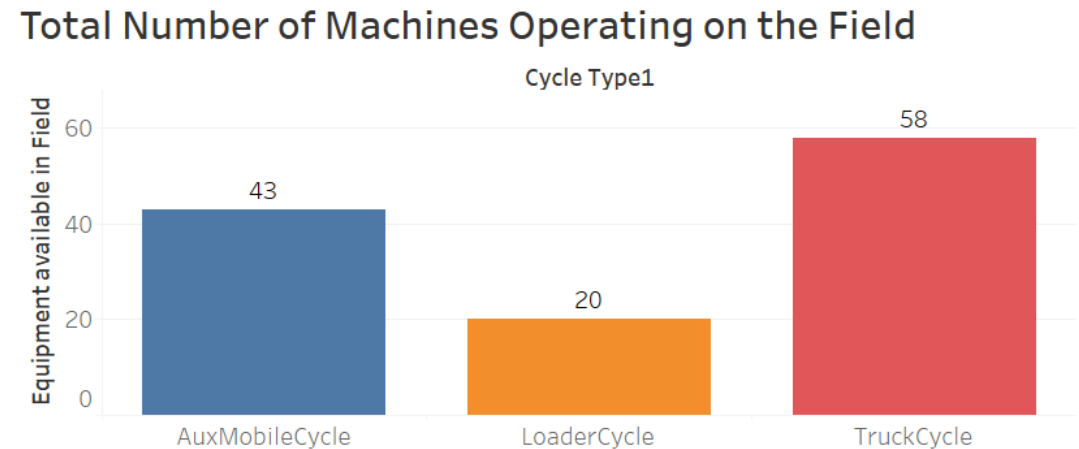
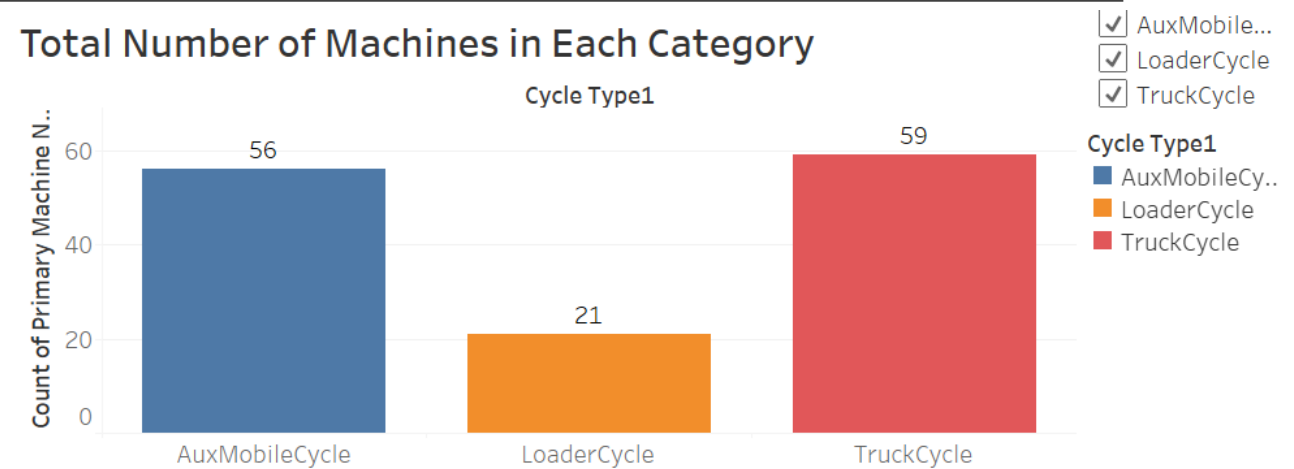
- The open-pit mine is facing problems of inefficient production and is losing customers' trust as they are not able to meet their demands even though there has been no surge in demand.
- The mine has operations such as the digging of ore and crushing of ore into a finer composition where this ore gets 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.

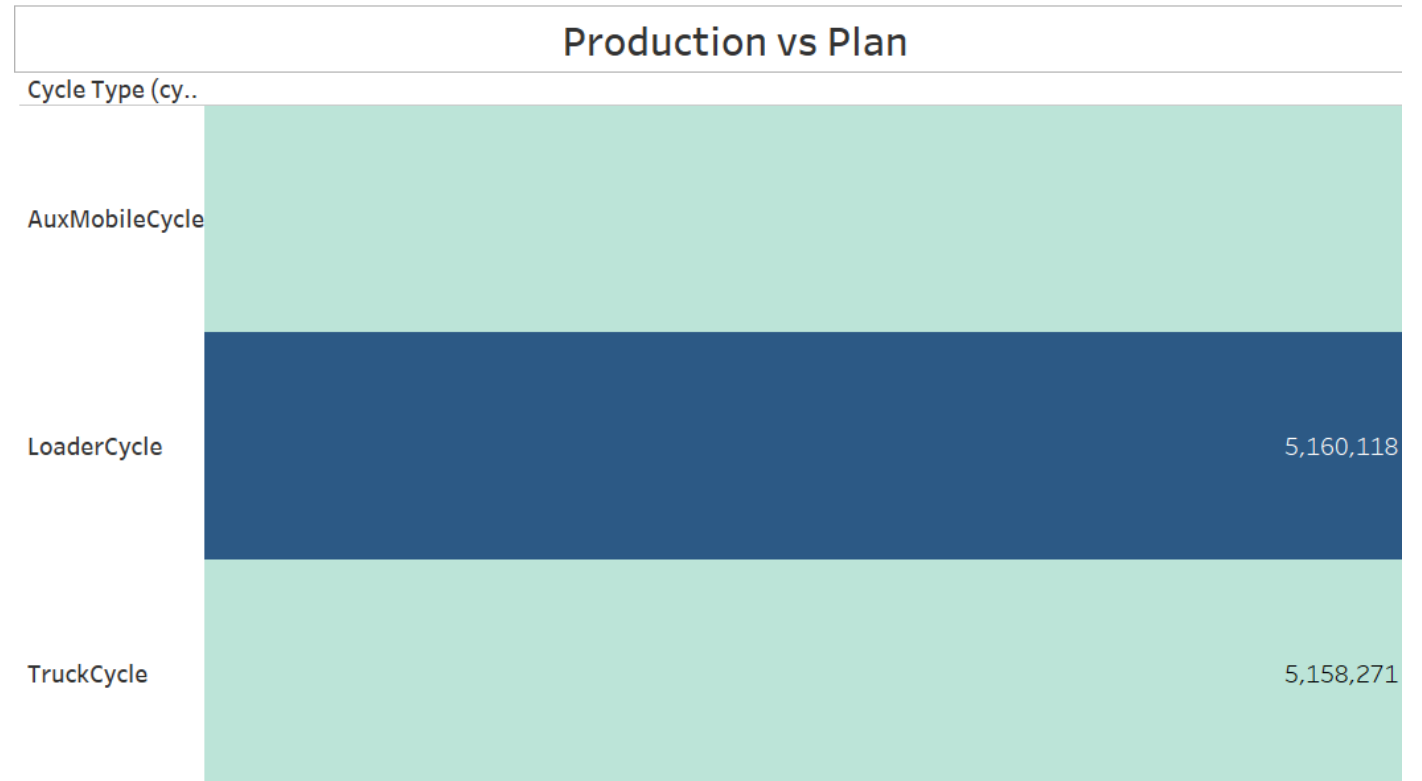
Equipment Availability

- 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.



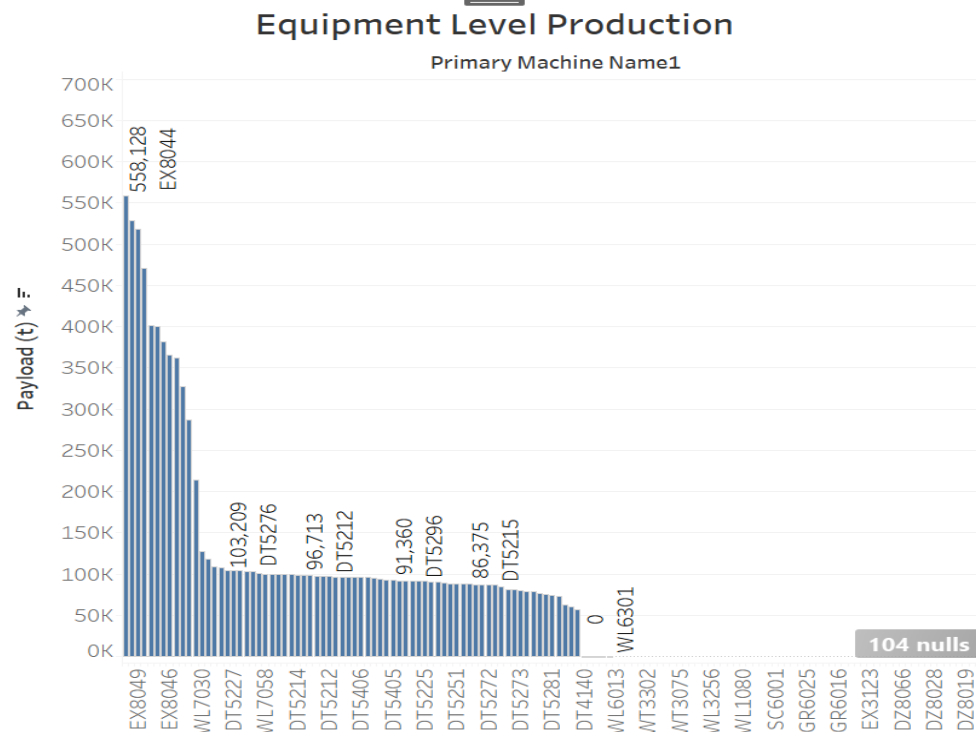
Production Rates

- 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



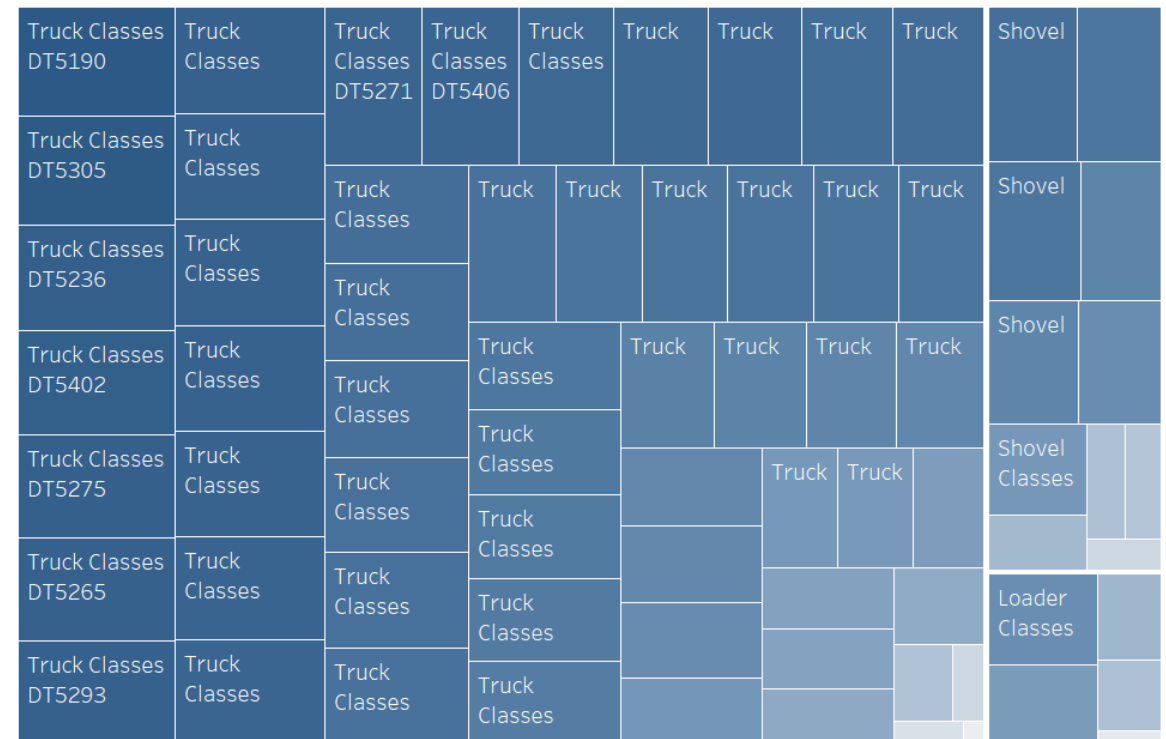
Equipment Performance

DT5190 Truck Classes	DT5213 Truck Classes	DT5227 Truck Classes	DT5274 Truck Classes	DT5210 Truck Classes	DT5220 Truck Classes	DT5212 Truck Classes	DT5292 Truck Classes	DT5306 Truck Classes	DT5216 Truck Classes
DT5305 Truck Classes	DT5295 Truck Classes	DT5317 Truck Classes							
DT5225 Truck Classes	DT5407 Truck Classes	DT5276 Truck Classes	DT5286 Truck Classes	DT5211 Truck Classes	DT5308 Truck Classes	DT5401 Truck Classes	DT5168 Truck Classes	DT5235 Truck Classes	
DT5236 Truck Classes	DT5171 Truck Classes	DT5271 Truck Classes	DT5296 Truck Classes						
DT5402 Truck Classes	DT5406 Truck Classes	DT5294 Truck Classes	DT5172 Truck Classes	DT5170 Truck	DT5209 Truck Classes				
DT5265 Truck Classes	DT5214 Truck Classes	DT5275 Truck Classes	DT5248 Truck Classes	DT5405 Truck					
DT5293 Truck Classes	DT5273 Truck Classes	DT5403 Truck Classes	DT5269 Truck Classes	DT5251 Truck	DT5223 Truck				
			DT5267 Truck Classes	DT5268 Truck	DT5272 Truck				
						DT5250			
						DT5281			

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

Overall Equipment Effectiveness



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