1)

a)

The problem that we as a company will see is that, regardless of the outside temperature, the temperature of inner compartments of the storage container should be maintained to keep the vaccines safe. Furthermore similarly we can add pressure gauge to maintain the pressure inside as well as outside.. There can be also a condition, where in storage may be sent via high altitude lands, let’s assume the storage will require diesel power to run cooler generator, so the combustion of diesel will depend on amount of oxygen in the air. As we ascend on higher altitude the oxygen in the air decreases limiting the power of cooling the vaccines.

In all the problems that can be addressed are:-

* + - * + Temperature balancing/control
        + Pressure monitoring /control
        + Oxygen monitoring
        + Altitude Monitoring

b)

The company can use this opportunity and can apply machine learning algorithm to understand and forecast the outer temperature ,pressure and oxygen . Geo-Location of the moving storage can also come handy to make the understanding better for the ML. Adding over pressure ,temperature and oxygen monitoring can have the function anomaly detection so that any sudden change in sensor data can be monitored and the temperature can be altered.

c)

* Unsupervised Learning - Because we will be analysing and clustering unlabelled data sets using machine learning methods. Without the need for human interaction, these algorithms uncover hidden patterns in data.

d) There will be temperature measure and pressure measure taken from the sensors outside the container, as well as inside the container using temperature and pressure sensors , Geo-Location can also be taken to improve forecasting of outside temperature. We can perform polynomial regression for predicting . The output will help predict the outside temperature and then we can adjust our temperature fluctuation accordingly.

Similarly we obtain oxygen amount in air and also O2 exhaust(from lambda sensor ) ,and apply anomaly detection . Here we can find that whether the generator used to run the cooler container is lacking for oxygen combustion .If it lacks then it will switch to battery operated or solar or an other power source .

2.

a)

In this business, even a minor blunder can lead to serious problems and a significant loss of credibility. It could be a simple data entry error, a lapse in inventory forecasting, a design flaw, or a manufacturing issue.

Resource Planning − It involves summarizing and comparing the resources and spending.

b)

We can use anomaly detection for system health monitoring or fault detection .

Also we can use classification algorithm for resource planning .

c) Unsupervised Learning - Because we will be analysing and clustering unlabelled data sets using machine learning methods. Without the need for human interaction, these algorithms uncover hidden patterns in data.

d)

We can use anomaly detection for to uncovering data that does not fit into broad patterns that are considered normal . We can detect data errors (measurement inaccuracies, rounding, incorrect writing, etc.)noise data points. We run anomaly detection in many ways one of which is we can test the current flowing through the entire IOT sensor device ,if the anomalous than the normal current we can consider it as a faulty piece . This will help us to discard a faulty IOT sensor device ..

3)

a)

@ATTRIBUTE sepallength REAL

@ATTRIBUTE sepalwidth REAL

@ATTRIBUTE petallength REAL

@ATTRIBUTE petalwidth REAL

@ATTRIBUTE class {Iris-setosa,Iris-versicolor,Iris-virginica}

b)

Table

Description automatically generated

There are 50 instances of each

c)

Classification accuracy is 96 %

d)

Correlation coefficient 0.8343