Detailed Project Report (DPR)

CSP-Cost Management

Faiyaz Khan: 1.8

Abstract

Cost management systems are simply the methods used to evaluate the results of decisions made as a result of **cost management** strategies. **Costing systems** have three primary goals: ... - to provide **cost** information for operational **control**, and. - to measure inventory value and **cost** of goods.

1 Introduction

The purpose of this document is to present a detailed description of the Deep **Cost management systems**. It will explain the purpose and features of the system, the interfaces of the system, what the system will do, the constraints under which it must operate and how the system will react to external stimuli. This document is intended for both the stakeholders and the developers of the system and will be proposed to the higher management for its approval.

Main objectives & Problem Statement

- Understand invoice costs and associate the costs to the customer, subscriptions, resource groups, and services.
- Get an intuitive view of Azure costs in cost analysis with capabilities to analyse costs by customer, subscription, resource group, resource, meter, service, and many other dimensions.
- View resource costs that have Partner Earned Credit (PEC) applied in Cost Analysis.
- Set up notifications and automation using programmatic budgets and alerts when costs exceed budgets.
- Enable the Azure Resource Manager policy that provides customer access to Cost Management data. Customers can then view consumption cost data for their subscriptions using pay-as-you-go rates.
- Export their cost and usage data to a storage blob with a pay-as-you-go subscription.

My Responsibility

- Firstly, I have studied and researched about Cost Management System
- I have Analysed Requirements, validate available data.
- Created Visualizations, reports, and Dashboard using Power BI
- Created calculated columns and measures using DAX formula.
- Created Document of Understanding of the project

Start Date	1st Jun 2021
End Date	11th June 2021
Team Size	5 Member
Technologies	Power BI, SQL, MS Excel, Microsoft Azure
Designation	BI Developer

2. Technical specifications

Dashboards:

1. Actual & Forecast Summary
2. Actual & Forecast Detail
3. CSP Cost Summary
4. CSP Cost Details
5. Weekly Cost Summary

Total Dashboard	5
No. of Tables	7
Name of Table	Dim Table, Exchange Table, CSP Costing, Forecasted, Requested Buffer, VW-All Resources, VW-Forecasted subs
Data Source	Azure, SQL Server
Volume of Data	100 MB
Freq. of Refresh	Every week on Mon

KPI (Key performance indicators)

- Slicer for Currency Exchange
- Actual Cost & Forecast Cost by date
- Weekly Cost Consumptions
- Cost By Resource Group
- Top N Cost by Resource Group
- Top N Cost by Resource Type
- Cost Distribution using Decomposition Tree
- Cost By Category
- Cost By Sub Category
- Cost By usage date
- Cost Distribution by Meter
- Accumulated Qty by Usage Date

Detailed Project Report (DPR)

Solar Plant

Faiyaz Khan: 1.8

Abstract

Present your Solar plant's performance data in a unique way. With this Dashboard, the information and performance are appealingly and clearly presented.

The Project customized in some main Equipment/Assets:

Inverter:

A power inverter, or inverter, is a power electronic device or circuitry that changes direct current to alternating current

SCB

The combiner box is a device that combines the output of multiple strings of PV modules connection to the inverter

Transformer

A transformer is a passive electrical device that transfers electrical energy from one electrical circuit to another, or multiple circuits

Pyranometer

This is used for measuring solar irradiance on a planar surface & it is designed to measure the solar radiation flux density (w/m²).

1 Introduction

The purpose of this document is to present a detailed description of the Energy Solar Plant. It will explain the purpose and features of the system, the interfaces of the system, what the system will do, the constraints under which it must operate and how the system will react to external stimuli. This document is intended for both the stakeholders and the developers of the system and will be proposed to the higher management for its approval.

Main objectives & Problem Statement

- Fault Diagnostics
- Probable Reasons of Failure
- Prediction
- Inverter Health Score
- Comparative Analysis
- Anomaly Analysis
- Loss Distributions
- Plant Performance
- Month Wise Loss Distribution
- Month wise plant performance

My Responsibility

- Firstly, I have studied and researched about Energy and Solar Plant

- I have Analysed Requirements, validate available data.
- Created Visualizations, reports, and Dashboard using Power BI
- Created calculated columns and measures using DAX formula.
- Created Document of Understanding of the project

Start Date	1st Apr 2021
End Date	30th May 2021
Team Size	5 Member
Technologies	Power BI, SQL, MS Excel, Microsoft Azure
Designation	BI Developer

2. Technical specifications

Dashboards:

1. Solar Plant Homepage

2. Inverter Analytics

3. Inverter Details

4. SCB Analytics

5. SCB Details

Total Dashboard	5
No. of Tables	6
Name of Table	Measure Table, Demand Supply, ICR AC IGBT Inverter, SCB last 7 days, Weather
Data Source	Azure, SQL Server
Volume of Data	200 MB
Freq. of Refresh	

KPI (Key performance indicators)

- Demand Vs Generation by Year
- Generation by Year
- Supply Gap by Year
- Plant summary by Weather
- Plant Equipment performance summary

- ICR Health Status
- Fault Prediction
- Total Anomalies by ICR INV
- Count of Anomalies
- Remaining Useful life

- SCB Health Status
  Total Anomalies by ICR INV
- Actual Current vs Prediction

Low Level Design (LLD)

ARTIFICIAL INTELLIGENCE BASED DETECTION

OF LUNGS DISEASE FOR COVID PATIENTS

Document Version Control

Date Issued	Version	Description	Author
	1.1	First Draft	Kratika
	1.2	Added Workflow Chart	Srinivas
	1.3	Added Exception Scenarios Overall, Constraints	Abhishek
	1.4	Added KPIs	Abhishek
	1.5	Added user I/O Flowchart	Sarang
	1.6	Added Model Diagrams	Sriharsha
	1.7	Added dataset overview and updated user I/O flowchart	Rohit
	1.8	Restructure and reformat LLD	Kratika
	1.9	Dashboard	Faiyaz

Table of Contents

Abstract

Coronavirus disease (COVID-19) is highly contagious and pathogenic. Currently, the diagnosis of COVID-19 is based on nucleic acid testing, but it has false negatives and hysteresis. The use of lung CT scans can help screen and effectively monitor diagnosed cases. The application of computer-aided diagnosis technology can reduce the burden on doctors, which is conducive to rapid and large-scale diagnostic screening.

In this paper, we proposed an automatic detection method for COVID-19 based on spatiotemporal information fusion. Using the segmentation network in the deep learning method to segment the lung area and the lesion area, the spatiotemporal information features of multiple CT scans are extracted to perform auxiliary diagnosis analysis. The performance of this method would be verified on the collected dataset.

1 Introduction

1.1 Why this Low-Level Design Document?

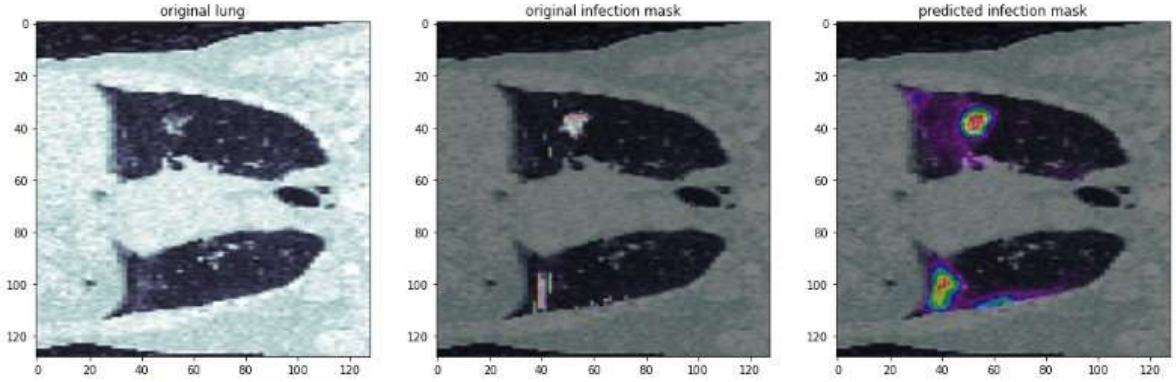
The purpose of this document is to present a detailed description of Artificial Intelligence Based Classification of Lungs Disease for Covid patients. It will explain the purpose of the classification of lung diseases and how it can be implemented using machine learning algorithm by processing the CT scans of the patients. The document is intended for both the stakeholders and the developers of the system and will be proposed to the higher management for its approval.

The main objective of the project is to identify whether the patient has been affected by Covid-19 or not, if yes, then identify the location of the affected area and then mark the infection and label it.

At present, the diagnosis of Covid-19 mainly depends on the nucleic acid kit for reverse transcription-polymerase chain reaction (RT-PCR) to determine the presence of viral nucleic acid. But the test has its own limitations due to which it's not reliable for an accurate testing of the patient and thus can lead to false negative results for the affected Covid patients.

Chest CT may be considered in those Covid-19 patients who are at an increased risk for disease progression (age >65 yr and with associated co-morbidities - diabetes, cardiovascular disease, chronic respiratory disease, obesity, hypertension, immune-compromised), have only mild symptoms and a normal/indeterminate CXR, but record arterial oxygen saturation (SpO2) of <93 per cent at rest while breathing normal room air or have an abnormal six-minute walk test (when there is an absolute decrease of >3% in SpO2 after a six-minute walk)," it emphasised for the most vulnerable group.

With the increasing cases of Covid, classification and segmentation of patients would ease the task of radiologists and also would reduce the duration of diagnosis for an individual patient.



1.2 Scope

The deep learning algorithm would label the lung diseases for Covid patients based on the location of the infection in the lung which will help to predict the disease earlier. Early prediction of the disease would provide timely treatment of the patient. Labelling the infected area on CT Scan images would also reduce the burden on the doctors and ensure better hospital management services.

1.3 Constraint

The project will only be labelling the infected area, and it will not attempt to classify the lung disease.

1.4 Risks

There's probability of false negatives depending upon the accuracy of the model.

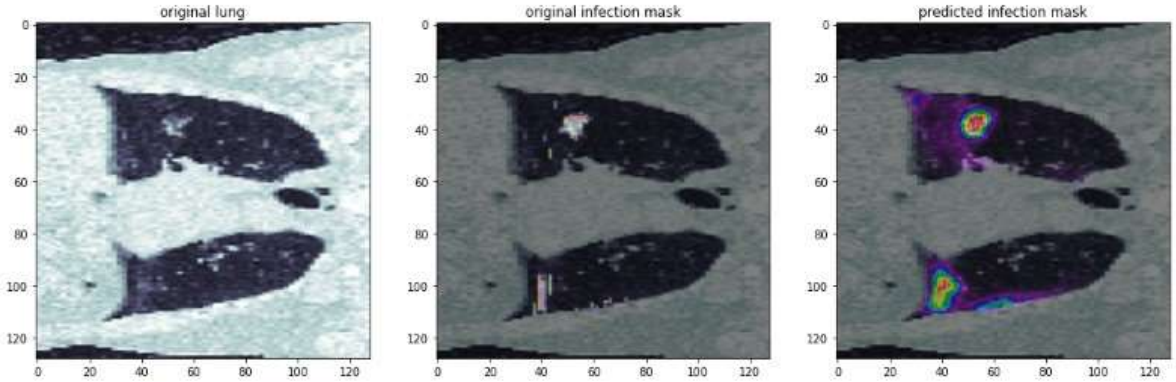
1.5 Out of Scope

Classification of lung diseases is out of scope for this project.

2 Technical Specifications

2.1 Dataset

CT Scan Data	Finalized	Source
Original Lung CT Scan Image	Yes	https://www.kaggle.com/daenys2000/unet-segmentation
Original Infection Mask	Yes	https://www.kaggle.com/daenys2000/unet-segmentation

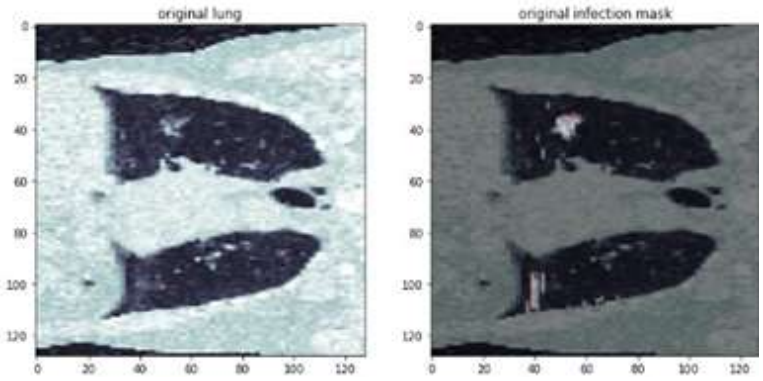


2.1.1 CT Scan Dataset Overview

The data consists of CT Scan Images of the Lungs of the patients who are to be tested for Covid. There are two kinds of images for CT Scan – Original and Infection Mask. The dataset consists of the original Lung CT Scan and original infection mask CT Scan images of the patients being tested for Covid-19. The infection mask CT Scan Image will have the coordinates for the infected area which will be used to validate the algorithm. The volumetric dataset has been collected for 20 patients.

2.1.2 Input Schema

Feature Name	Data format	Size (pixels)	Null/Required
CT Scan	.nii	512 x 512	Required
CT Scan	.nii	630 x 630	Required



3 Technology Stack

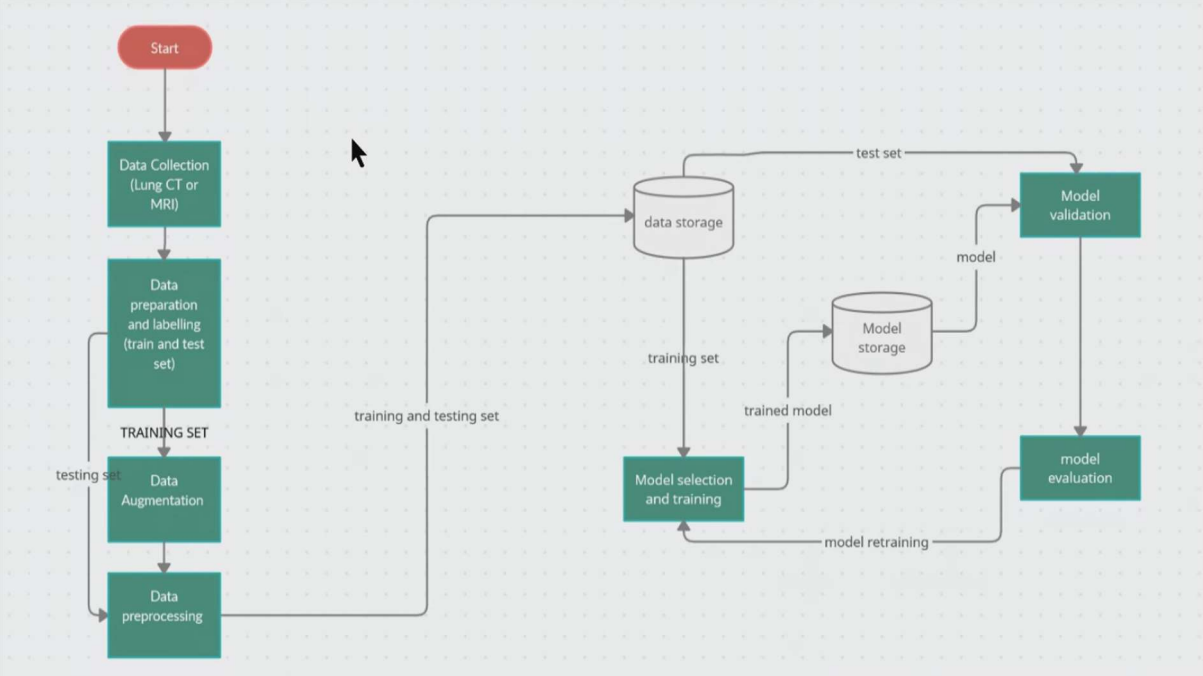
Front End	HTML/CSS/JS
Back End	Flask API, Python Django
Database	Not Required
Deployment	ML Flow/Kube Flow

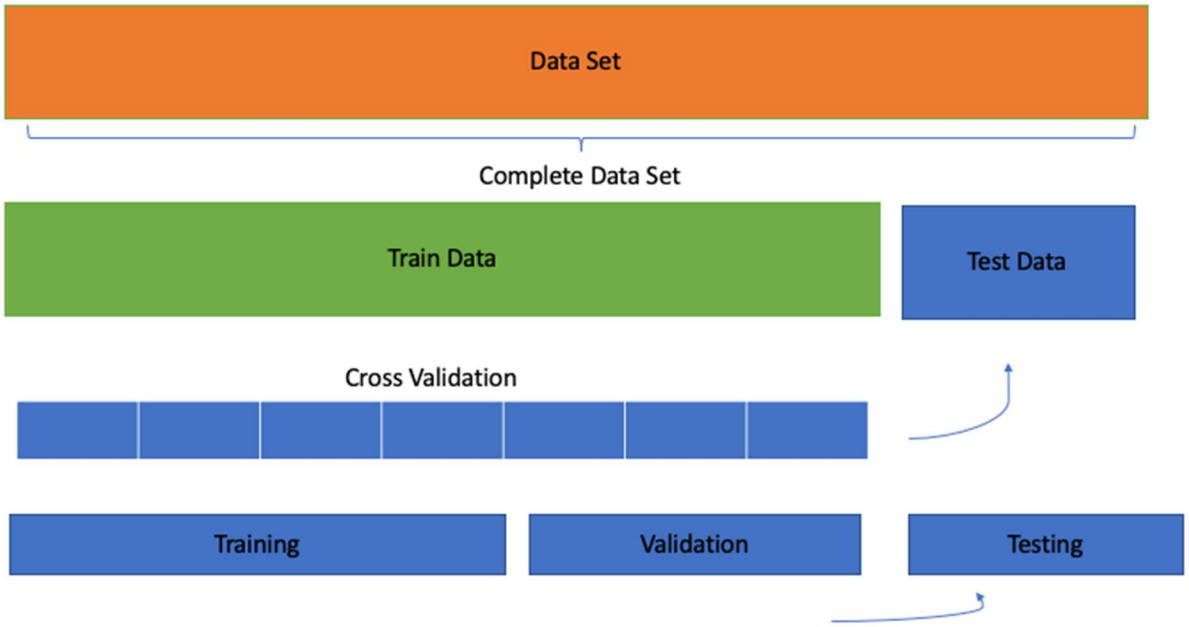
4 Proposed Solution

Refer: https://arxiv.org/abs/2007.04774

Based on the actual research paper, we would implement 3D U-Net architecture as we require semantic segmentation for the disease diagnosis. U- Net is a Fully Convolution Network architecture used for Semantic Segmentation of images. It was primarily designed to process biomedical images. The benefits this algorithm offers are reduced training time and redundancy issues and perform good even on lesser data.

5 Model Training/Validation Workflow




Data Set
Complete Data Set
Train Data
Test Data
Cross Validation
Training
Validation
Testing