

PROJECT NAME	PROJECT MANAGER
Forecasting and Analysis of Raw Materials using Drone	Afroz Mohammad

PROJECT DESCRIPTION

In any industry, raw materials form the crux of the production process. As colossal amounts of raw materials are stored and utilized, it becomes laborious to keep track of the existing inventory as well as to attempt to predict the amount of raw materials required for the next production cycle. The project, "Forecasting and Analysis of Raw Materials using Drone," aims to simplify the process of determining the amount of raw materials present in the stockyard using drone imagery.

The major raw materials used in the steel industry are Limestone, Coke and Iron Ore which can be differentiated based on color. The purpose of the drone is to capture color images for analysis using digital image processing to derive useful data. Advanced analytics will be applied on current and historic data, to generate a summary report which includes informative statistics and trend analysis.

Business Objectives

- To implement a forecasting application system for raw materials in a steel plant.
- To reflect the real-time status of stockyard occupancy.
- To digitalize inventory management.
- To visualize the related analytics and figures on a user-friendly dashboard

Assumptions

- Colors of the raw materials involved are known.
- Enough data is available for analytics purpose.
- Resources will be available when needed.

Constraints

- Raw materials could be scattered across the stockyard.
- Obstacles present in the stockyard.

PROJECT PLAN

Implementation

The drone is used to take pictures of the stockyard while following a pre-defined path. The captured images are then sent to the database periodically for storage. These stored images are analyzed using Image Processing and rendered on the dashboard. The dashboard features different images of the stockyard corresponding to different timestamps, a summary report is generated using Image Processing and certain figures which forecast the excess amount of raw material required for the production process.

Implementation Requirements:

Software:

- Python
- Anaconda Libs
- OpenCV
- Azure ML Services
- Azure Storage

Hardware:

- Wi-Fi enabled Drone
- Windows 10 Operating System
- 8Gb RAM, i3 processor

Data, images of stockyard, is required to implement the Image Processing phase of the project. A certain amount of historical data is also needed if any prediction or analysis is to be done. A production schedule is also required to compare the requirement.

Feasibility Requirements:

- **Technical feasibility**

This is a web-based application and the technologies associated with it include:

- Azure Student Services
- HTML, CSS
- JavaScript
- Python
- APIs

The above technologies are available for free and the technical skills required are manageable.

- **Time feasibility**

The Time limitations and the ease of implementing the project using the mentioned technologies is also synchronized.

- **Resource feasibility**

The resources required for this project include:

- Programming devices (Windows 10 OS, 8Gb RAM/ i3 processor): Available
- Wi-Fi enabled Drone: Available
- Programming Individuals
- Programming Tools and Services: Available for free

The project has the required resource feasibility.

Project scope

- **Design & Development**

Narrow down the modules involved in developing the application, followed by determining the flow of each module and integration of the modules.

The modules involved in building the application include:

- User Interface
- Database
- Image Processing
- Drone – Database Interface

- **Testing**

Adopt a testing strategy and create system test scripts, according to the user acceptance testing criteria.

- **Deployment**

Deploy a forecasting application system for raw materials in a steel plant and enable technology assisted inventory management while reflecting on the real-time status of stockyard occupancy. Visualize the related analytics and figures on a user-friendly dashboard.

Scheduled Status Meetings

MEETING	PURPOSE	FREQUENCY
Project Team Status	Communicate Statuses, Issues, Risks, Action Items, Decisions	Everyday
Project Leadership	Communicate Status, Issues, Risks, Decisions	Bi-Weekly or Weekly

Scheduled Status Reports

REPORT	PURPOSE	TIMELINE
Implementation and Feasibility	Implementation and feasibility requirements	WEEK 1
Project Plan	Project team, scope, objectives and approach	WEEK 1
Action Plan	Key actions and their priority, responsibilities, and timeline	WEEK 1
Software Requirements Specifications	Functional and non-functional requirements	WEEK 2
Architecture Specifications	Structure, behavior, and views of the system	WEEK 2
Design Specifications	UI design details, flows	WEEK 5
Test Specifications	Scenarios to be tested, tools for testing, timeline for testing	WEEK 7

Project team

INTERN	RESPONSIBILITIES
Aishwarya Kanna	Image Processing, User Interface, APIs
Akhila Atmakuri	Azure services, Database, Testing
Bharati Akella	Azure services, Database, Testing
Medini Rachapudi	Image Processing, User Interface, Testing
Sahithi Mikkilineni	Image Processing, Database, APIs
Sravya Sree Dhulipala	Image Processing, User Interface, Testing

ACTION PLAN

ACTION	PRIORITY	STATUS	START	END
Goal #1: Raw Materials Data				
Images of stockyard	High	Pending		
Historical data	High	Pending		
Color of raw materials	High	Pending		
Goal #2: API				
Select API for Drone- Database connection establishment	High	In progress	3/2/20	
Store data in Cloud	High	Not started	17/02/20	21/02/20
Retrieve from Cloud	High	Not started	17/02/20	21/02/20
Goal #3: Database				
Selecting the appropriate database	High	In progress	4/2/20	
Retrieve images from database for algorithm	High	Not Started	10/02/20	14/02/20
Store data from Algorithm to Cloud	High	Not Started	10/02/20	14/02/20
Goal #4: UI				
Design the dashboard and flow	High	Not Started	24/02/20	28/02/20
Implement the UI design	High	Not Started	24/02/20	28/02/20
Establish connections with other modules	High	Not Started	24/02/20	28/02/20
Goal #5: Image Processing Algorithm				
Developing Algorithm	High	Not Started	2/03/20	6/03/20
Get image from cloud	High	Not Started	2/03/20	6/03/20
Analyzing Image	High	Not Started	2/03/20	6/03/20
Summary report	High	Not Started	2/03/20	6/03/20
Forecast the requirement of raw materials for outcome	High	Not Started	2/03/20	6/03/20
Goal #6: Testing				
Adopt a testing strategy	High	Not Started	9/03/20	13/03/20
Create system test scripts	High	Not Started	9/03/20	13/03/20
Run the test scripts	High	Not Started	9/03/20	13/03/20