

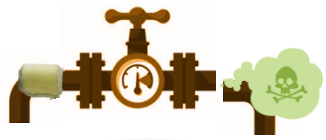


# Classification and Retrieval System for Gas Pipe Repairs

Checkpoint #1

Team 1: Michele Panteleo, Prima Acharjee, Minal Jamshed

# Outline



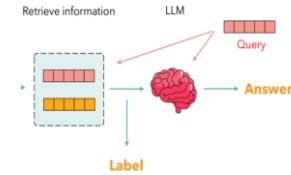
Setting to  
Mission



Value  
Proposition



Stakeholders



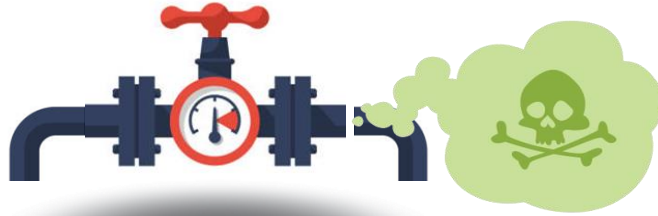
Design



Management

# Setting

This project deals with **gas leaks**.

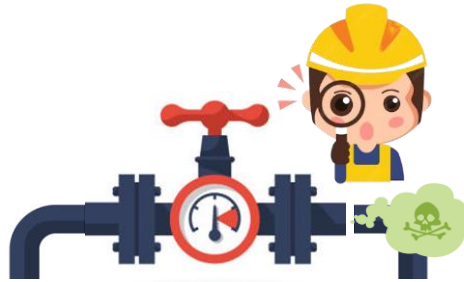


Gas leak



# Setting

This project deals with **gas leaks**. Whenever a fault happens, gasfitters are asked to **fix** it by choosing the **best** strategy (welding, substituting, **patching**).



Gas leak



# Madflex Patches

A **durable** and **versatile** patch for low pressure gas pipes made of **recyclable** materials (e.g. carbon fibre, aramid fibres, foams).



# Patchable?

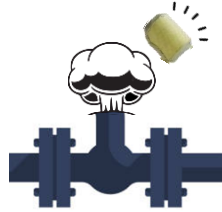
A successful application may depend on pipe conditions and settings



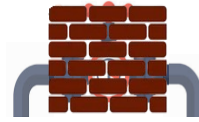
Corrosion



Damage



Pressure



Position



Exposure



# Double intervent, double risk

Scenario: the **applied** patch did not hold. **Then**, the pipe had to be **substituted**, trashing both the old pipe and the patch.



Risk



Waste



Economy



Timing



# Idea

Scenario: an intelligent system **supports** workers in **decisions**, preventing from bad patch applications.



Risk



Waste



Economy

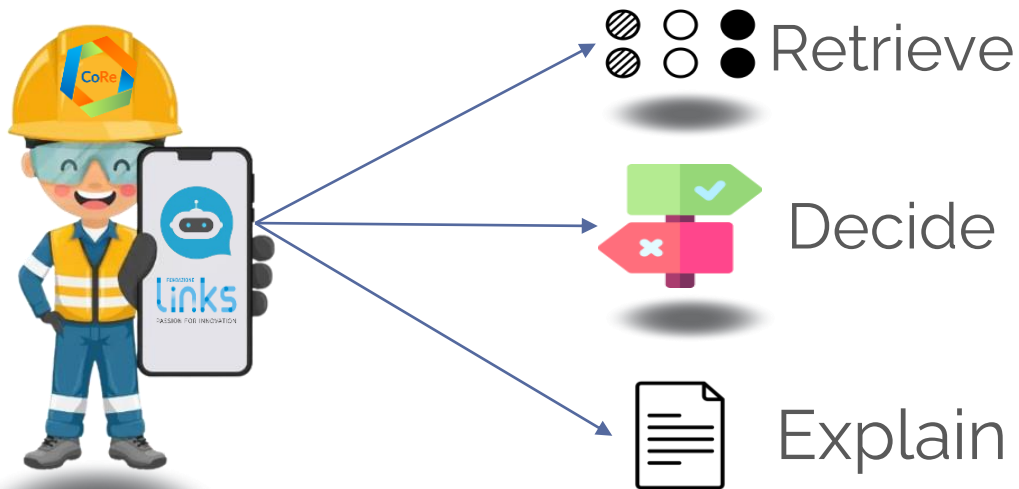


Timing

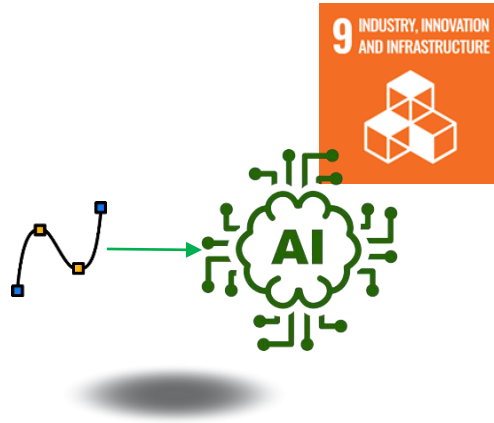


# Mission

Our mission is to develop a **chatbot** to help gasfitters about **patching or not**, explaining **why**. Chatbot will answer based on **fault description** and **past interventions**.



# Value Proposition



Innovate



Reduce Gas Leaks  
Impact



Improve Safety



# Value Proposition (SDGs)



Industry,  
Innovation,  
Infrastructure



Responsible  
Consumption  
and Production



Sustainable  
Cities and  
Communication





# User Persona- Featuring Raj!

**Age:** 40

**Location:** Urban Area

**Education:** MSc in Mech. Engineer

**Company title:** Sr. Gasfitting Technician

**Experience:** 10+ years in the field





# User Persona- Featuring Raj!

## Produce/Use:

- Reports on gas leaks and repairs.
- Maintenance checklists.
- Feedback on system performance.
- Past data on repairs.
- Real-time analytics.
- Regulatory updates.

## Needs:

- Reliable tool.
- Access to accurate information.
- Support in complex decision-making.

## Goals:

- Ensure compliance in all repairs.
- Minimize environmental impact.
- Reduce downtime.
- Achieve customer satisfaction.

## Expected Outputs:

### From System

- Recommendations- repair or replacement.
- Data-backed insights
- Updates on safety issues.

### From Raj

- Documentation of interventions.
- Continuous improvement in repair practices.

# Raj's Journey



## ➤ Daily Responsibilities of Raj-

- Ensuring Safety
- Minimizing Environmental Impact
- Efficient Repairs

### i. Encountering a Gas Leak

- One day, Raj arrives at a site with a damaged low-pressure gas pipe.
- **Uncertainty** whether he should go on a quick patch or full replacement.

### ii. Using Chatbot

- Raj uses the chatbot for guidance.
- Chatbot **analyzes** the fault using past data.
- **Suggests** a repair over a substitute.

### iii. Decision Making

- Raj feels **confident** with the data-backed decision.
- Proceeds with the **recommended** kit application.

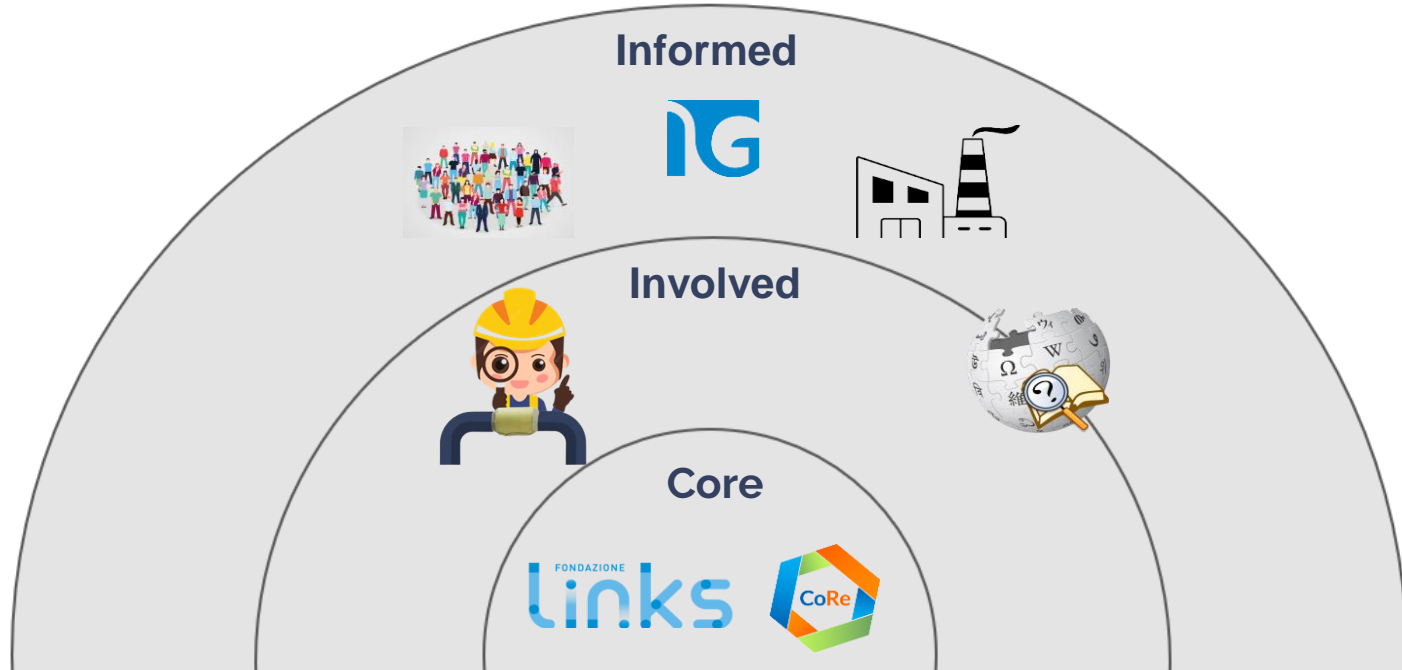
### iv. Outcomes

- A **reliable** repair.
- Task completed **efficiently**.
- **Reduces** impact by avoiding waste.

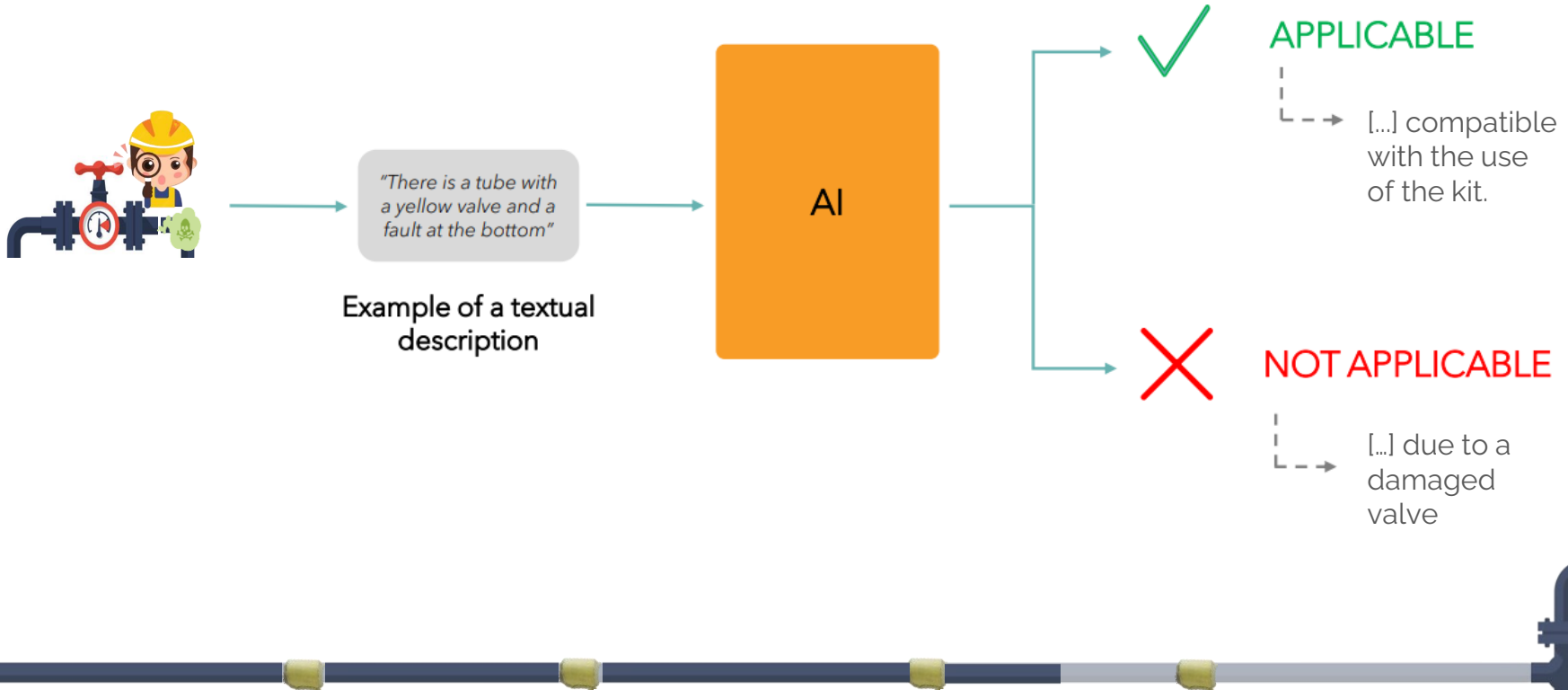
### v. Alignment with Goals

- Utilizes **advanced** tools for better **decision-making**.
- Adheres the **commitment** to **sustainability**.

# Stakeholders Map

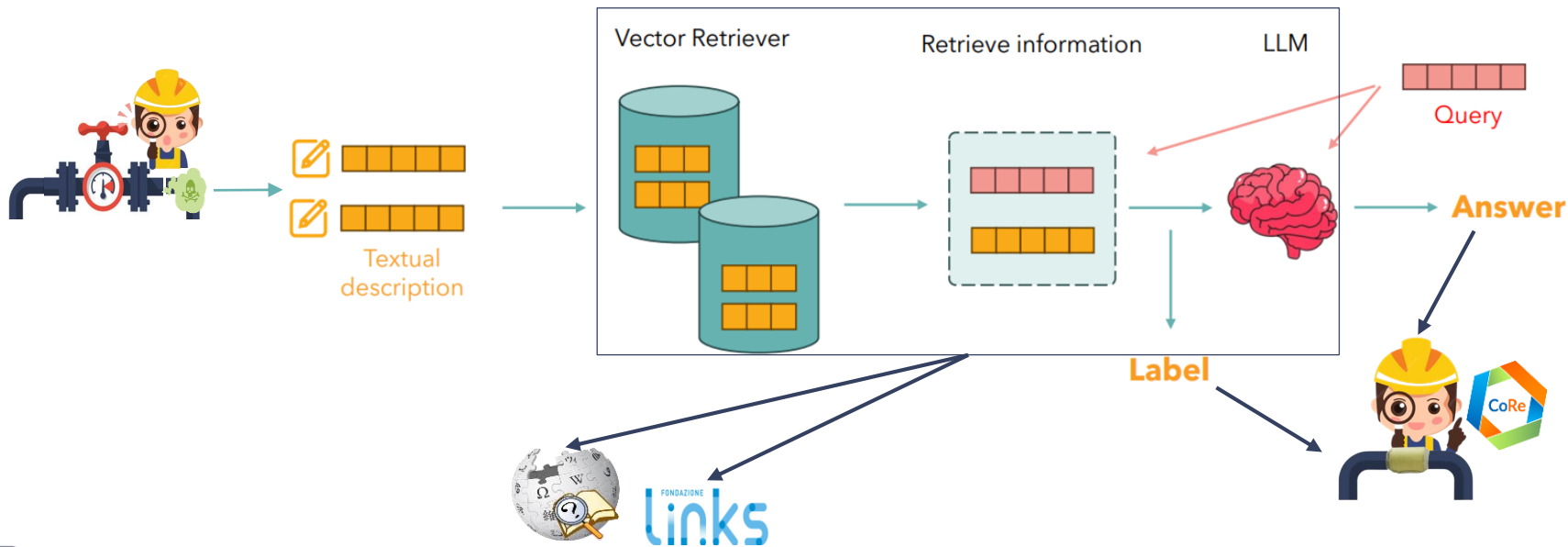


# Functional Diagram





# Retrieval Augmented Generation System





# Management Plan

## Work Breakdown Structure

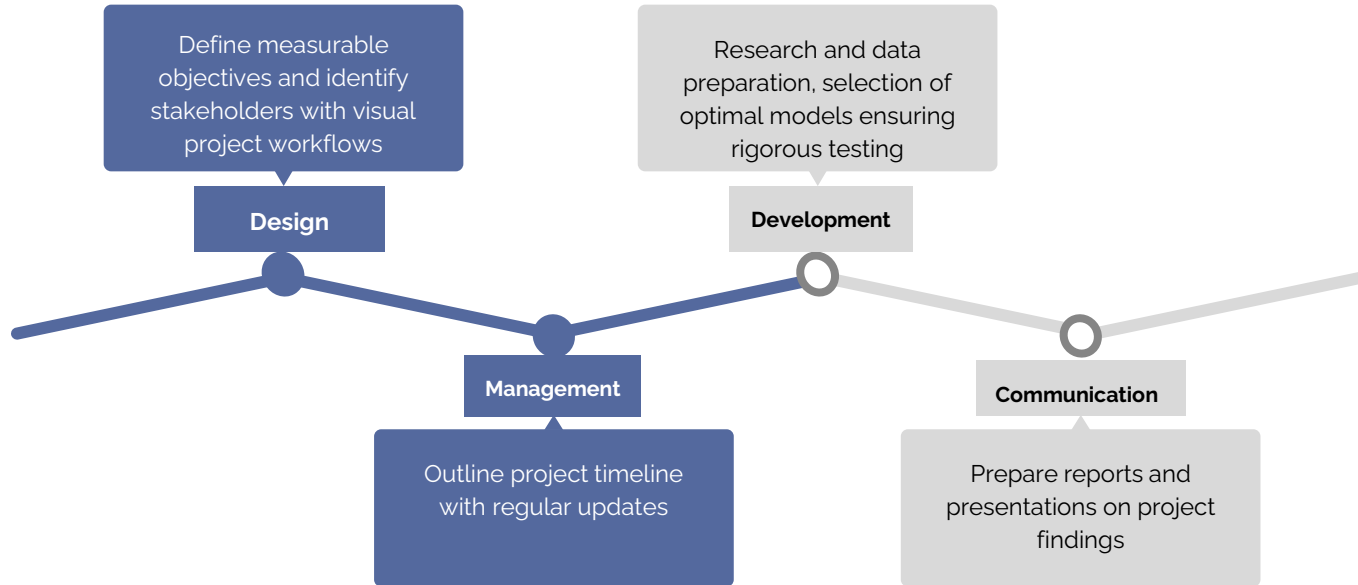
WP No.	WP Title	Lead Name	Start Month	End Month
1	Design	Panteleo.M	Nov-24	Nov-24
2	Project Management	Acharjee P, Jamshed M, Panteleo M	Nov-24	Jan-25
3	Development	Acharjee P, Jamshed M,	Nov-24	Jan-25
4	Communication	Acharjee P, Jamshed M, Panteleo M	Jan-25	Jan-25



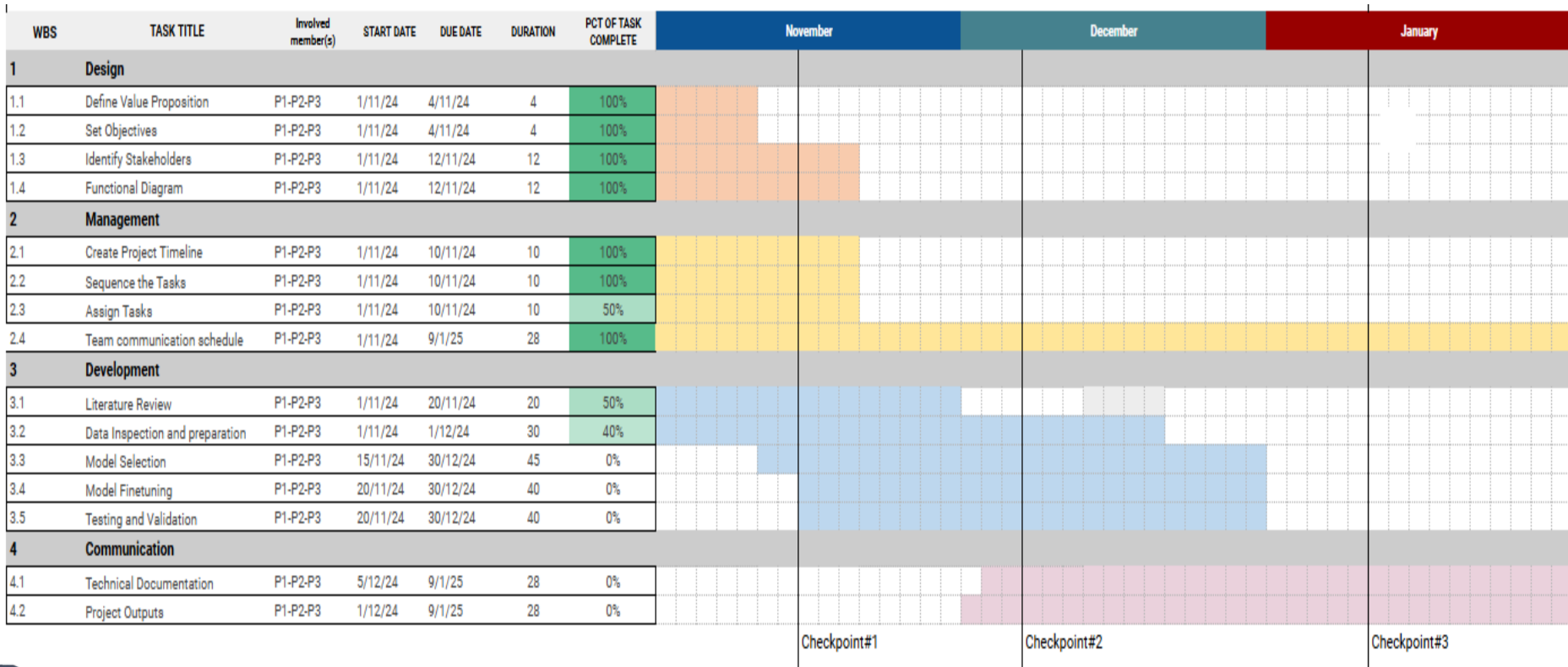
## Overview of the Work Packages

Start Month	Nov-24	End Month	Nov-24
WP Title	1. Design		
Description			
1.1 Define Value Proposition			
1.2 Set Objectives			
1.3 Identify Stakeholders			
1.4 Functional Diagram			
Start Month	Nov-24	End Month	Jan-25
WP Title	2. Project Management		
Description			
2.1 Create Project Timeline			
2.2 Sequence the Task			
2.3 Assign Tasks			
2.4 Team Communication schedule			
Start Month	Nov-24	End Month	Jan-25
WP Title	3. Development		
Description			
3.1 Literature Review			
3.2 Data Inspection and Preparation			
3.3 Model Selection			
3.4 Model Finetuning			
3.5 Testing and Validation			
Start Month	Nov-24	End Month	Jan-25
WP Title	4. Communication		
Description			
4.1 Technical Documentation			
4.2 Project Outputs			

# Management Plan



# Gantt Chart





# THANK YOU!

Grazie!  
ধন্যবাদ  
شکریہ