Design Doc Template

*Author(s): xyz*

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# Introduction

## Summary

Non-technical project overview, also known as an executive summary or elevator pitch. Intended to quickly summaries the problem you are trying to solve.

Transformers are most costly and it gets difficult to check every transformer manually. Before transformer is scheduled to be shipped to its designated site, it's important that you coordinate with the manufacturer what acceptance tests should be carried out. But there are no tests being conducted after a transformer is being installed. This leads to reduction in service life which can be prevented. The easiest solution for finding the health index of power transformer is to monitor it online. Sensors detect the values of parameters like voltage, current and moisture which judge the health index and are then compared with the maximum range. We have used colored markers on Google Maps to locate the transformer and two colors red and green for representing bad and good condition of transformer respectively.

## Background

The problem statement was given by Skipper Seil in Smart India Hackathon 2019 .

We have opted to represent the health index of the transformer on Google Maps because its easier to look at its health index represented by a colored marker on Google Maps rather than a report.

**The problem statement, what are the issues you are trying to solve, what gaps currently exist, etc.**

We are trying to prevent transformer from further failure by online monitoring and it makes it lot easier.

Till today transformers are checked manually at every place which is a huge amount of work and it can be prevented.

**What are the existing tools that address these issues or gaps, and why do they not satisfy this problem? Why can’t the existing tools be updated to solve this problem.**

The transformers are checked manually at every place which is difficult and it is huge amount of work.

Manual entry is used till date but online monitoring makes it a lot easier.

**What overlaps will your solution have and how is it differentiated from the existing tooling.**

Our idea is to monitor transformer online whereas the existing tool is to manually enter and check it , which are both different.

**What are the gains / wins from creating this tool / solution?**

A transformer failure can be prevented before ahead by checking the transformer on Google Maps.

## Definitions, Acronyms, and Abbreviations

Definition of terms that will help readers understand the documents, or acronyms common in your project area

# Design Overview

## Requirements

**Project requirements, this can include requirements from customers, partners, or overseeing teams. The requirements for the project, this may include subsections for various types or sources of requirements**

Sensors are needed to detect the value of voltage, current ,moisture content which determines the health index of transformer. So sensors are needed to find the vales of parameters.

Ministry to provide required support for hardware.

### Documentation

**If the project requires any wiki pages, code comments, presentations, etc. that information should be included here**

## Minimum Viable Product

**A detailed description of the deliverable for this project, this is the minimal functionality required for the project to be considered successful and should not include stretch goals or future work.**

A webpage to continuously monitor the condition of the transformer online after installing at a place. We need sensors to detect the values of parameters which judge the health index of transformer. And point the condition of transformer on Google Maps using two colored markers, red for representing bad condition and green for good condition.

## Stretch goals

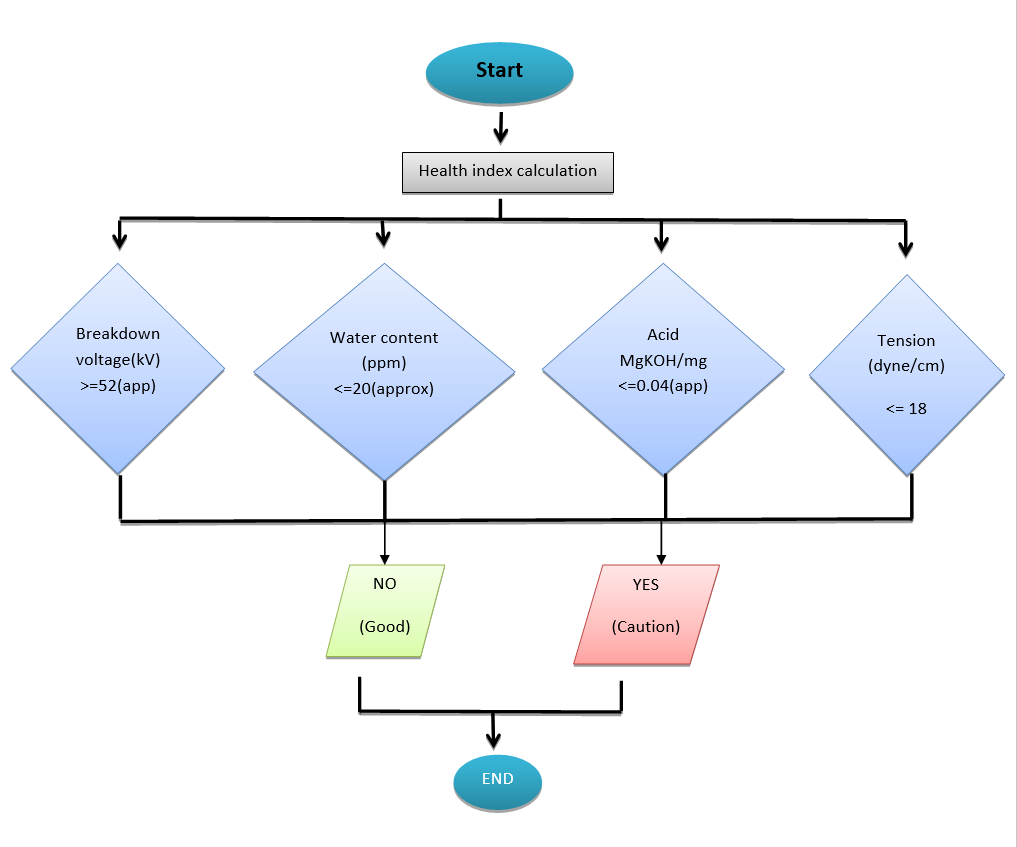
Stretch goals include functionality beyond the scope of the minimum viable product that should be include in the project should time and budget permit. Unlike future work, stretch goals would be smaller tasks for features in support of the minimum viable product.

## Future work

This may include ongoing support, expansion of the original scope, work that requires transitions in project ownership, or details of projects designed to be broken up into multiple phases.

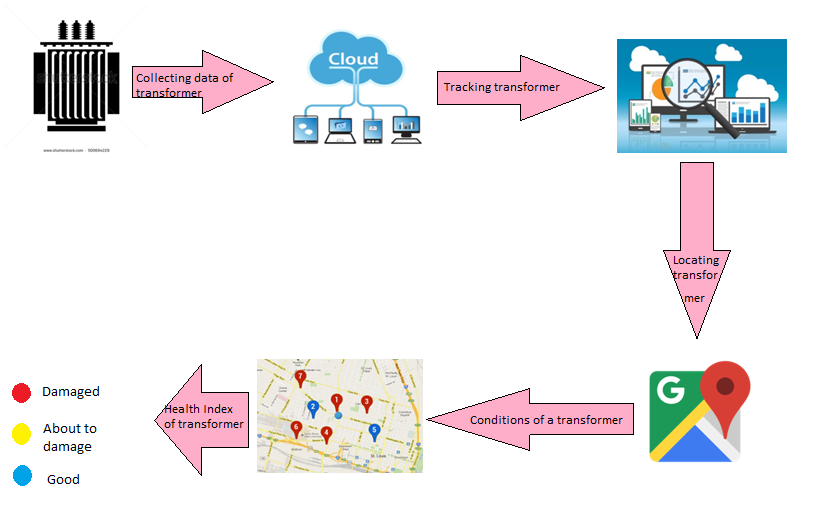
# Architectural Diagrams

UML diagrams describing the project. You can look for any open source diagramming tool for the same.



# System Diagrams

This section, sometimes referred to as a ‘System Context Diagram’, would typically consist of a UML diagram which illustrates the boundary and interaction with external systems. For a CLI this may show which backend systems provide the data, for services it may indicate dependencies such as databases, Kafka, or downstream services.



# Application Programming Interface

For services, libraries, and command line interfaces that present an interface which can be wrapped

## Recommendations

Using a versioned endpoint simplifies the process of making future backwards incompatible API changes;

# User Interface

**For frontends, a mockup can be attached to illustrate the user interface. Command line interfaces may include a list of subcommands and their options**.



Red – for representing bad condition of transformer.

Green- for representing good condition of transformer.

# Data Models and Storage

For projects requiring messages queue such as Kafka, MySQL, etc.

Kafka

* How many partitions are needed for this topic?
* How many days of retention will be needed?
* What will the partitioning key become?
* How much data will be written to the topic during peak hours?
* What type of Kafka cluster will be needed? (E.g. aggregate, queuing, tracking, metrics, logging)

MySQL

* What does the table schema look like and how are they all tied together (provide a UML)?
* What sort of updates will be made to the tables?
* How will users make queries to the tables? (e.g. Complex joins, pre-filtering, single record gets)
* What the strategy for indexing?

# Service Operability

## Key Performance Indicators

Key performance indicators (KPI), describe how a service should be monitored and how its performance can be gauged. This would typically include an overview of the types of metrics an application will need to emit, call time, error rate, etc.

## Service Level Objectives

Service level objectives (SLOs), set targets for various KPI through alerts via email or SMS, these targets may provide early indicators of approaching a capacity limit, changes in load patterns through various phases of an application, changes in duration of offline processing, etc.

# Project Overview

## Communication and Tracking

Any relevant distribution lists, slack channels, taiga projects, etc

## Risks

**Anything that may put the project at risk; potential delays, dependence on work done by other teams, hardware procurement, or reviews.**

**Risks may also include assumptions of the project's external dependencies. These may be lower level project dependencies that are tracked outside of the immediate project scope and assumed to already be in place. For example, "project x assumes OS version y will be available in the market."**

Sensors may get damaged or blow down due to huge heat produced by the transformer.

## Milestones

**Estimated dates when planning steps, deliverables, and reviews will be completed**

We will include temperature sensor to find the temperature of the oil which is nearly equal to temperature of transformer material.

## Project Phases

**For projects that are better tracked and reported on in multiple phases because of extended timelines, external dependencies, etc**

## Cost

Level of effort, number of resources, number of hours or weeks, unlike milestones which tracks project time cost should only include engaged time.

1) For the all tasks which are deliverables/visible on user-end side needs to be documented as stories.

2) Need to guess/estimate the time required in number of hours for the completing that stories which can be captured in taiga.

3) Assign that task to the right person and document the actual time taken for completing that task.

# Frequently Asked Question

# References

Links to any supporting documentation, other projects, or reference material

# Addendum

Additional diagrams or details that do not particularly belong in the body of the design doc. This could also be a place to describe additional examples that would otherwise bloat the introduction section. More specifics on APIs could also be placed here for engineers to reference.