



open**SAP**

# **TOUCH IOT WITH SAP LEONARDO**

## **PROTOTYPE CHALLENGE**

**POWER TRANSFORMERS**

**Power Transformers**

This is a template that can be used for the Prototype Challenge included as part of the openSAP course "Touch IoT with SAP Leonardo."

# Story

Power transformers are medium through which the high voltage is step-down the power voltage from high transmission lines to equipment required voltage.

Transformers are continuous working machines and sometimes gets overloaded with multiple high power machines working due to extreme weather, transformer gets heat-up and many times gets burn which results power failure for the area transformer is installed to fulfill the power requirement.

Transformers need periodic maintenance and checkup for certain parameters to fulfill the power requirement and to avoid failure. Normally this is manual task assigned to line operators.

Sometimes manual negligence or missed periodic checkup causes transformer failure which impacts to user and overhead for company to replace transformer in a short span of time.

Connecting all transformers with IOT, they would be easily managed and observed at any time from any remote location and notifications would be received at regular intervals which avoids power failures and saves lots of energy loss & maintenance cost to rectify failure.

## Persona



# Sutikshn

## Area Supervisor

"My task is to energize the society without any disruption resulting human life easy with running machines".

### About

- I am an engineer and love to watch working electrical appliances.
- Responsible for providing uninterrupted power supply, keep moving all the time to check transformers and resolve their issues.
- Work with Line operators on ground and reports to General Manager for providing transformer reports.

### Responsibilities

- I am responsible for generating reports of transformers.
- I am responsible to make strategy for transformer maintenance.
- I take decisions when to replace a transformer based on power consumption on specific area.
- I am responsible to take precautionary actions during adverse environmental conditions.

### Needs

- I need to keep track of transformer loads and running conditions.
- I need to take precautionary steps during peak summer seasons to avoid power failures.
- I need to replace/fix issues for transformers within a short time.

### Main Goals

- I strategize transformers by analyze transformer various characteristics and considering future aspects.
- Minimum power failure and maximum productivity from transformers by monitoring transformers on regular basis.
- Coordinate with line operators for periodic transformers characteristic reading and maintenance as and when required to avoid failures.

### Pain Points

- Difficult to observe peak consumption hours to strategize for that short period.
- Sometimes line operator misses record periodic characteristics which sometime results transformer failure.
- During lightning strikes inbuilt safeguard need to monitor closely.
- Measure area power requirement and if required propose additional transformer to fulfill the area need.

## Point of View

As an Area supervisor

I need a way to regularly monitor all the transformers installed in my area for performance and working conditions

so that I can take necessary precautionary actions and can avoid big power failures.


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## User Experience Journey Template –

<p><b>ACTIONS</b></p>	<ul style="list-style-type: none"> <li>➤ Received call for transformer failure.</li> <li>➤ Starting for site visit.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Reached site.</li> <li>➤ Analyzed and found transformer needs replacement.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Arranged transformer from store.</li> <li>➤ Transformer dispatched to site.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Transformer replaced.</li> <li>➤ Analyzed for load and other parameters.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Sent failed transformer to workshop.</li> <li>➤ Transformer was faulted due to low oil level.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Generate report to submit to management.</li> <li>➤ Prepare strategy documents to minimize these types of failure in future.</li> </ul>
<p><b>MINDSET</b></p>	<ul style="list-style-type: none"> <li>➤ Ohh! One more failure.</li> <li>➤ This one is 3<sup>rd</sup> in the current week</li> <li>➤ Hope transformer needs minor fixture</li> </ul>	<ul style="list-style-type: none"> <li>➤ Look like its due to overheating.</li> <li>➤ People must wait a long for power.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Thank God!! Store is having repaired transformer available.</li> <li>➤ God! No more surprises this week.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Finally done!!!</li> <li>➤ Load should not be higher due to summer season.</li> <li>➤ This one is repaired one, must replace again in near future</li> </ul>	<ul style="list-style-type: none"> <li>➤ Let's analyze the failed machine at workshop.</li> <li>➤ Failed due to low oil!! Wasn't it tested properly</li> </ul>	<ul style="list-style-type: none"> <li>➤ Let's management be aware of this big power failure.</li> <li>➤ Need to reduce recording time for transformer parameters.</li> </ul>
<p><b>FEELING</b></p>	<p>😊</p>					
<p><b>TOUCH POINTS</b></p>	<ul style="list-style-type: none"> <li>➤ Phone</li> <li>➤ Transport</li> </ul>	<ul style="list-style-type: none"> <li>➤ Transport</li> <li>➤ Different equipment for power checkup</li> </ul>	<ul style="list-style-type: none"> <li>➤ Phone</li> <li>➤ Tab</li> </ul>	<ul style="list-style-type: none"> <li>➤ Transformer</li> <li>➤ Different equipment for transformer checkup</li> </ul>	<ul style="list-style-type: none"> <li>➤ Transport</li> <li>➤ Faulty machine</li> <li>➤ Camera</li> <li>➤ Tab</li> </ul>	<ul style="list-style-type: none"> <li>➤ Laptop</li> <li>➤ History reports</li> </ul>

# Mockup: Power Transformer

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Connected Goods ▾
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## Standard, ONAN

IDB-100-11

● Mapped
 📶 Connected
 ⚡ On

Line operator: Ram Kishan

Notify

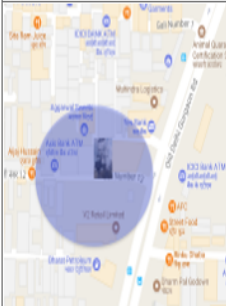
Live Load

102.4 KVA


2 min ago

This Transformer is overheating	10 min ago
This Transformer is overloaded	50 min ago
This Transformer has low oil level	10 days ago
Lightning strikes has happened	15 days ago

Street 12, Sequence 1,  
Kapashera, Fun N Food,  
Delhi - 110037

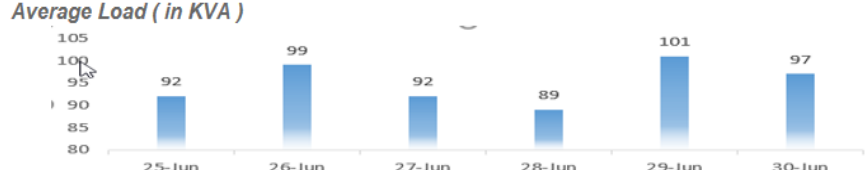


### Average Winding Temperature ( in °C )



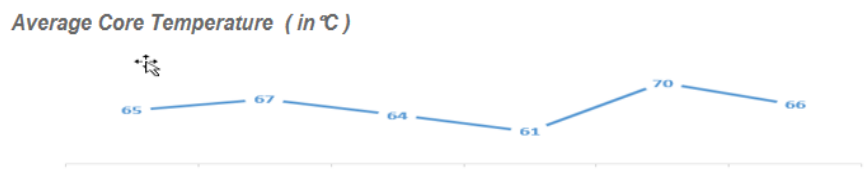
Date	Temp (°C)
25-Jun	63
26-Jun	66
27-Jun	62
28-Jun	59
29-Jun	68
30-Jun	64

### Average Load ( in KVA )




Date	Load (KVA)
25-Jun	92
26-Jun	99
27-Jun	92
28-Jun	89
29-Jun	101
30-Jun	97

### Average Core Temperature ( in °C )



Date	Temp (°C)
25-Jun	65
26-Jun	67
27-Jun	64
28-Jun	61
29-Jun	70
30-Jun	66

### Average Resistance ( in ohms )



Date	Resistance (ohms)
20-May	0.1396
30-May	0.1407
4-Jun	0.1184
14-Jun	0.1243
19-Jun	0.1299
24-Jun	0.1162

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