



Max bridge
SOLUTIONS

IOT Case Studies



Live Cart Tracking Solution

Executive Summary:

Client is India's Largest manufacturer of the full range of high-performance insulators (ceramic as well as composites) for T&D lines, sub-stations, power equipment and railway electrification.

Scope of Work:

Client intends to implement an IoT based Production Line Automation to achieve an automated information on the Machine Running Condition.

The stages of the Cars are as follows: -

Indoor

A. Car Drying

Empty Cars run through Driers and kept inside the Factory shed for getting loaded with Products after Cementing.

B. Car Loading

The Empty Cars are loaded with Products and move outside the plant in outdoor area for Curing.

Outdoor

The loaded cars are carried to open area for curing and the curing has two stages which are as follows:

A. Water Curing

The Cars loaded with Products are put into water tanks for Water Curing for a certain period of time (3 Days).

B. Air Curing

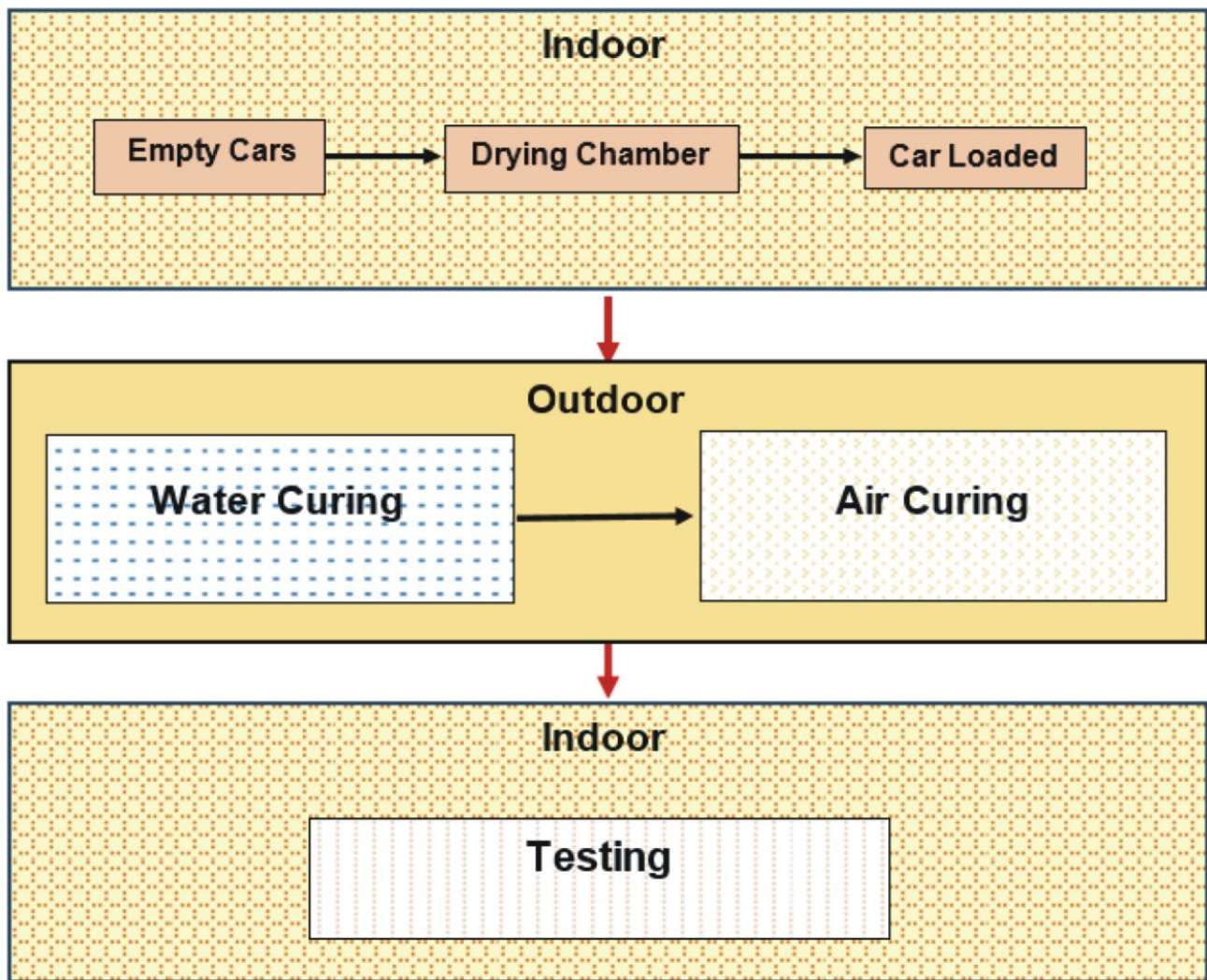
The Cars loaded with Products after finishing the Water Curing Stage is put outside the tank and put in open space for Air Curing. Air Curing continues for a certain time period (3-4 days)

Indoor

A. Testing

Once the Air Curing stage is complete the Cars loaded with Products move to the testing zone and the cars are emptied.

There are currently 850 Cars in use inside the client factory. These Cars need to be tracked live at the stages as follows:



Objective

- Visibility of Cars' Position on Real Time Basis.
- Track Specific Cars on Real time basis.
- Eliminate Time consuming search process of the Cars.
- Track the duration of cars in each stage which is directly related to the quality of the Finished Goods

Solution Proposed

After going through the requirement **Maxbridge** proposes a solution where the cars can be tracked both in outdoor conditions as well as indoor conditions.

The solution consists of: -

Hardware

- IOT Beacons - Tags.
- An IOT Gateway – Transmit Data.
- Anchors – BLE Locator.

Software

A Web Application with following features:

After going through the requirement Maxbridge proposes a solution where the cars can be tracked both in outdoor conditions as well as indoor conditions.

The solution consists of: -

- A Visual Dashboard displaying
 - Current Car position.
 - Movement of Cars over a time period.
- Track Selected Cars by a mobile app and SonicAlert mounted on the Cars.
- Calculate the duration of the Cars loaded with products at each stage during its journey from loading inside the factory till unloading at the Testing Zone.

Generate alert by SMS or Email or message on the dashboard when a car stays beyond or below the prescribed duration at each stage.

Solution Design

Maxbridge Solutions proposes here in two steps:-

A Network Infrastructure for Indoor and Outdoor Areas

Indoor

Area	Apx. Dimension (L/B)
Zone 1	40/10 ft
Inspection Area	
Zone 2	161/40 ft
Processing and Heating Area	



Outdoor

For Water Curing Process

Area	Apx. Dimension (L/B)
Tank 1 & 2 (T1 & T2)	144/40 ft
Tank 3 (T3)	46/40 ft
Tank 4 (T4)	105/40 ft

For Air Curing Process

Area	Apx. Dimension (L/B)
Dumping Area 1, 2 (D1, D2)	280/35 ft
Dumping Area 3 (D3)	50/14 ft
Dumping Area 4 (D4)	30/30 ft
Dumping Area 5 (D5)	100/80 ft
Dumping Area 6 (D6)	50/23 ft
Dumping Area 7 (D7)	56/28 ft
Dumping Area 8 (D8)	80/15 ft

Networking Infrastructure Hardware:

IOT Gateway

For transmitting Data to the Server.

This is a Long Range BLE (Low Energy Bluetooth) Device which is required for all the necessary incoming data, where both the location beacons as well as the anchors will emit necessary information and this gateway streamline and transmit data to the cloud platform



Anchor/BLE Locator

To Create Zones and calculate the positions of the Cars across the whole area.

These devices are designed as location precision taggers. These are completely battery operated and portable so that they can be arranged in the most effective layout giving out accurate and precise location data. The layout of the anchors is to be placed in a strategic manner so that these anchors act as the base anchoring point (locating) for the location beacons. This means the beacons leverage the anchors in order to calculate the precise location by first scanning the location of these installed anchors and then using triangulation method by banking on the angle from the anchors to calculate its own location.



BLE Beacon Tags

BLE Beacon Tags will be fitted to the Cars carrying materials. Each Tag will have a Sonic Aler System i.e. a buzzing Hooter with a LED Beaconsing light of Industrial Standard

The Location Beacon with Sonic Alert is an intelligent device that can scan its surroundings, calculate its location and transmit the same to the nearest Gateway. This device will be installed on the moving Cars within the designated areas of the manufacturing unit.



An Intelligent Locating Mechanism – The locator beacons are self-sustaining equipped with Edge- Computing which while entering a location scans all the anchors nearby and by using triangulation method calculates its precise location banking on the nearest anchor.

Powerful Alert Mechanism – This device generates loud buzzing sound and a powerful light signal pinpointing the location when searched by personnel from his mobile device near the location area. The user can search the car by pressing a button or key from his mobile phone app.