PROJECT PROPOSAL

VEICULU-OUTDOOR

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I.   Summary

The proposed solution is dedicated to the efficient management of parking system in the city. Finding and managing parking is a serious problem for cities across the

country, authorities as well as for the government in India. Metro infrastructure system offers a parking management system designed and built from the drawing board to the final delivery. The system will provide maximum security and reliability, with complete access to data management. The system is designed in a way to meet the needs of on-street parking as well as access controlled parking areas. The system will be a comprehensive system comprising the parking sensors, gateways, revenue management, and central software for administrative reporting and analytics.

On-Street parking management constitutes of:

1. Parking payments methods:

The system can be integrated with multiple methods for parking payments; as desired by city authorities such as

- Coins & cash
- Credit card
- Debit card
- Mobile wallet payments
- Monthly parking permits
- POS Terminals

2. Sensor based system for the space tracking:

Wireless sensors are embedded in each parking space to identify its occupancy status in real time. The information from parking sensors is updated to a central system that keeps track of parking status across the entire street or block of that area.

3. Mobile app to locate parking spaces

A downloadable mobile app named VEICULU provides users with information about available parking spaces and parking fees at any given time. Based on this information, users can easily locate the parking space closest to their destination without having to circle around the streets to find parking space.

4. Real time detection of violations

Based on the occupancy status determined with the help of sensors, the system can guide the enforcement authorities to potentially offending vehicles with expired time limits or illegal parking. This mechanism saves significant time for the enforcement officers and helps them to guide the violators or take other necessary action.

The proposed Parking systems can be implemented in any situation where allocated parking applies, our car parking systems include barriers and bollards which prevent use of parking spaces unless access is provided. These types of parking systems are perfect for residential parking whereby access is limited to residents or in places of work where parking is minimal.

II.   Introduction

With vast experience on enterprise solution on BFSI domain, Senrysa has started venturing into mobile application development on Android /iOS platforms, artificial intelligence & machine learning, data analytics and Internet of Things (IoT).

VEICULU is the first consumer service initiative of Senrysa. VEICULU is one stop shop for vehicles ("*Aapki Gaari, Hamaari Zimmedaari*") for providing parking service in the nearest parking spot, avail driver on demand, car insurance purchase, car wash and car repair services, car pooling and a dedicated ecommerce platform for car accessories. It also notifies vehicle insurance policy renewal date and emission test date.

We are very confident that our VEICULU app will bring a smarter experience to our smart citizens.

III. Goals/Objectives

The aim of Veiculu app is to:

- ❖ Facilitate urban mobility
- ❖ Effectively organize parking
- ❖ Control pollution
- ❖ Secure parking for all kinds of vehicles e.g, 2/3/4 wheelers
- ❖ Provide smarter parking in smart cities
- ❖ Control congestion by eliminating redundant traffic
- ❖ Stimulate local economy and improve quality of life

Veiculu app provides constant real-time information about:

- ❖ The nearest car parks
- ❖ The number of available spaces
- ❖ Numerous other services like car wash, car repair etc.
- ❖ Car insurance policy and emission test renewal

Veiculu app – an 'all in one' mobile app for all Veiculu customers:

- ❖ Easy to use
- ❖ Ergonomic
- ❖ Comprehensive

Take the stress out of parking!!!

IV. Working Principle of Parking Management

Parking Management Solution consists of three parts: data acquisition system, real-time processing database system and information releasing system. Occupancy of individual parking spaces is monitored by ultrasonic detectors and transmitted to the control center. Arrow displays and special symbols immediately show drivers the right way to free parking space. The management software visualizes the entire parking spaces by large LED display, performs statistical evaluations and directly intervenes in the system, for example, to reserve a parking space, to manually control zone displays or to monitor the parking time of each parking space.

Equipments to be used:

- Ultrasonic or Electromagnetic Sensors (1 per parking slot)
- LED Indicators (Indoor & Outdoor as applicable)
- Communication controllers (1 CCU)
- Zone Controllers (ZCUs - 1 per 30 meter area or 1 per 60 Detectors)
- Network Switch (1 per 48 Wireless Receivers)
- Wireless Receivers/Access Points (1 per 2-3 ZCUs)
- Guidance Display (1 per intersection/crossing)
- Server (1)
- PC (1)
- Parking Guidance System Software (1)

For covered or indoor parking lots, the parking guidance system enables the car owner/driver have a visual indication of available parking space once he/she enters the car park. Ultrasonic or Electromagnetic detector installed on each space monitors real-time parking status, and reports to zone controller. Zone controllers gather information from all ultrasonic detectors timely and submit to PC-based control system via data converter. PC will process all the data acquired from controllers and convey request to associated guidance displays updating number of available space.

The Parking Guidance system quickly and easily guides parkers to vacant bays using a combination of signs and bay indicators. For covered or indoor parking lots, once the customer reaches an aisle with bays available, they will be able to easily identify the vacant bays at a glance. Bay indicators are mounted on the ceiling above each space and are equipped with extra bright LED's, indicating the status of the parking space (vacant, occupied, reserved) and its type (disabled - blue LED, parents with prams - white LED, reserved – yellow LED etc). This results in a better customer experience.
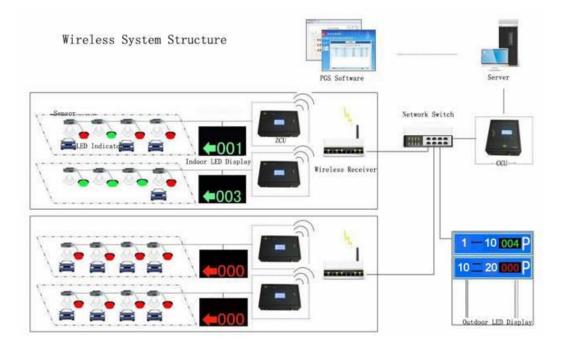
Central Controller (CCU)

Central controller (CCU), the core of the whole system, is mainly responsible for the collection of parking information and data's processing of the whole car park. Then send the feedback of the processed result to LED display to show carport information. The general Edition does not have the data storage function, thus the need to connect to the server and install the parking guidance system software.

Node/Zone Controller (ZCU)

The node/zone controller(ZCU) is the middle layer of ultrasonic parking detector, which is to manage a group of ultrasonic detectors, detects then loops the information of the detectors and send the relevant information to central controller. One node controller can support 60 detectors in max.
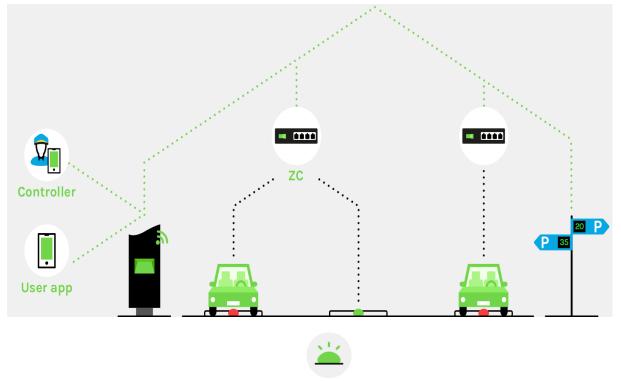

Parking solution system diagram

V. **WHAT IS** VEICULU-OUTDOOR

Veiculu-Outdoor is a parking management system on-street that allows automatic control and guidance of spaces.

This spaces automatic control system works through wireless technology, all elements are connected to the same network. Each detector reports the status of the space to the zone controller, which in turn transmits the information to the parking meter. To this network are connected parking signals the controllers that make the spaces control on the street.

Thanks to this space guidance system, users can find the available parking spaces on the street and drive directly towards them, reducing traffic and saving time.

VEICULU-OUTDOOR ARCHITECTURE

Magnetic sensor

A small detector placed in each space that detects whether a vehicle is parked or it is free, indicating it with a LED light.

LED signal

Optionally, it is possible to install different LED signals that indicate the number of available spaces on a street.

Zone controller

Controller that all magnetic detectors are connected to, controlling the number of parking spaces on a particular area.

Parking meter

Responsible of processing all parking spaces on the street. Receives data from the different zone controllers.

Controller app

The controller of the public road has an app which manage all offenses.

VEICULU App

Optionally, users can use an app (VEICULU mobile vehicle parking app) to replace the parking meter and see the spaces available.

Drivers download the app on their phone, which acts as a portable parking meter. It is aimed to facilitate parking to drivers and improve mobility in the
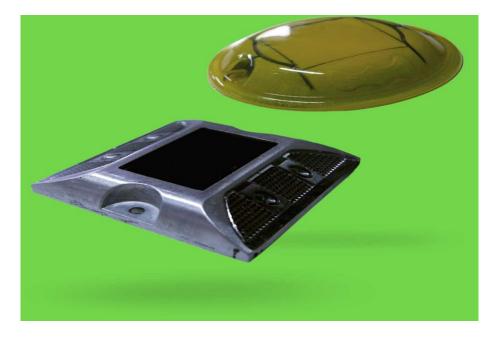
city. The parking agencies will use the VEICULU-Admin app to add parking zones & employees.

FLOOR MAGNETIC SENSORS

In this parking management system, every space of the pay and display area is numbered and has a LED signal that indicates the availability, making easier for drivers looking for parking.

For proper control of public parking spaces, there is placed on the floor of each parking space a magnetic detector. It recognizes if a vehicle is parked on the space, sends the information wirelessly to the zone controller and change its LED color from green to red.

ZONE CONTROLLER

The zone controller is another component of the on-street parking space control. This hardware receives data of each detector within its range, and transmits that data to the corresponding parking meter.

A zone controller covers a 30 meter area.

PARKING METER

CONTROLLER

Infractions and warnings

The controller will record all offences. Also, if the driver removes the vehicle from the space before controller reaches the parking meter, it would notify, may stop prematurely.

Regulated area controllers will have an app connected to the system and the parking meters. Through it, they can fine the vehicles and issue time tickets to drivers, improving efficiency and control.

All notifications generated by the controller are automatically sent to the Control Center.

The controller will fine drivers who haven't notified or have exceeded parking time, adding the license plate, car model and color. The controller may issue time tickets to drivers. He just needs to choose the time the user wants to be parked. If the driver leaves before the controller arrives, the parking meter will notify it.

Printer connection

The app connects to a portable Bluetooth printer, printing infringements quickly.

CONTROL CENTER REGULATED PARKING CONTROL

The Control Center is based on a web environment. Through its interface, it is possible to monitor and manage all regulated parking zones connected. As a result, the efficiency is increased and better parking control is achieved.

Parking meters, the user's app and the business's app report when a new car parks in real time, the license plate number and how long it will be stationed. And controllers report from their app all violations found immediately.

The Control Center receives different alarms and warnings from parking meters that require immediate solution. It also receives all notices that controllers report from their app in real time.

Control Center has a map that displays the different elements connected, grouped into areas.

PARKING SPACE SIGNALING

Veiculu-Outdoor can be complemented by a LED signalling network.

These signalling are a space guidance panels, located at the intersections. They inform drivers about available number of spaces in each street, without having to go into it, reducing search time and streamlines traffic.

The parking spaces management software updates all signals at the time, reporting the available number in real time.
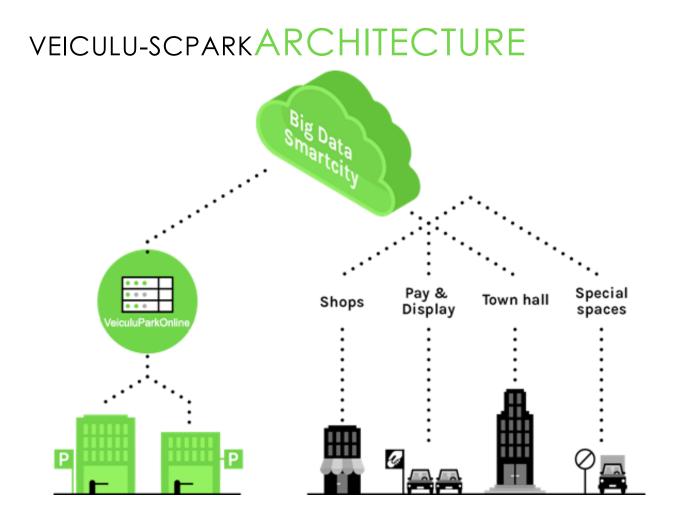
VI. PROPOSED FUTURISTIC SOLUTION:
WHAT IS VEICULU-SCPARK

Technology is increasingly present in the cities, and their services more interconnected between them, is what is known as **Smart City**.

The car park sector doesn't escape of it. **VEICULU-SCPark is the evolution of smart parking**, a smart city system in which all on-street parking and off-street services of the city are connected to, designed to provide all services seamlessly.

VEICULU-SCPark is a Big Data that allows connected systems to share data and link services to facilitate the mobility of citizens.

VEICULU-SCPARKARCHITECTURE

Smartcity

All parking systems of the city and other related services are **integrated in the Big Data**, providing and obtaining information. They mutually benefit from each other and facilitate mobility to citizens.
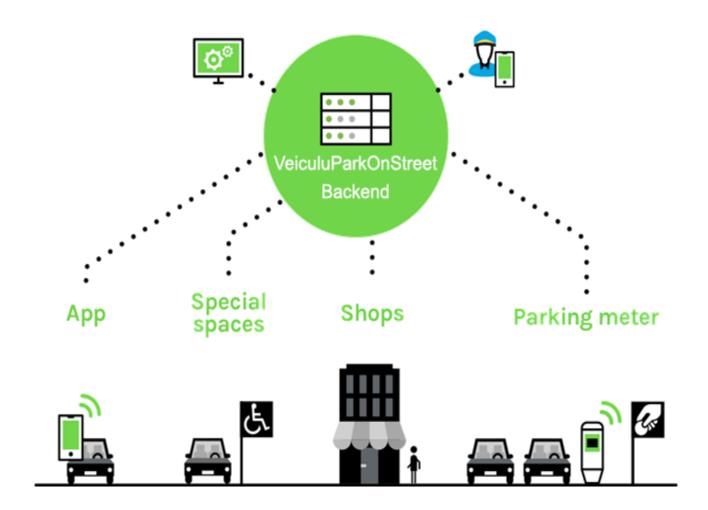
VeiculuParkOnline

A centralized system that **integrates all services that an intelligent parking needs**. It allows to control everything from a single location, and includes an app where users can book parking space, pay and access.

Connected services

Pay and display areas or businesses are **connected to VEICULU-SCPark Big Data**, allowing to link different services. For example, it is possible to reroute users of pay and display areas to nearby parking lots.

VII. Timetable & Budget

	Description of Work	Start and End Dates
Phase One	VEICULU mobile app	
Phase Two	Customization of Sensors, LED Indicators, Digital Signages etc. procured from OEMs	
Phase Three	Design & Implementation of Parking Management System	