

UNIVERSITÉ DE CARTHAGE
ÉCOLE SUPÉRIEURE DE COMMUNICATIONS DE TUNIS

Design Document

Smart Parking

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Introduction

The Smart Parking System is an innovative solution designed to enhance parking management through the integration of Internet of Things (IoT) technology and renewable energy sources.

By utilizing smart sensors and solar-powered systems, the solution provides real-time data on parking availability, streamlining the process for users and enabling parking owners to manage their facilities more effectively.

This document outlines the architecture and specifications of the Smart Parking System, providing detailed insights into the system's components, their interactions, and the overall design methodology. Through UML diagrams, we aim to visually represent the system's structure and behavior, facilitating a clear understanding for all stakeholders involved.

1 Solution and Objectives

The Smart Parking System aims to transform the parking experience by making it easier for drivers to find available spaces and reducing traffic congestion. Additionally, it provides facility owners with an automated solution for parking management, focusing on energy optimization and operational efficiency.

By the end of this project, we aim to achieve the following objectives:

- Develop a user-friendly smart parking solution that enhances convenience and simplifies the parking experience.
- Integrate IoT-enabled sensors for real-time monitoring of parking space availability, allowing drivers to locate open spots effortlessly.
- Implement automated access control through license plate recognition to enhance both security and efficiency.
- Provide a reservation feature, enabling drivers to secure parking spots in advance through an intuitive mobile application.
- Track solar energy production, battery levels, and power consumption to support sustainability and reduce operational costs.
- Offer facility owners a comprehensive dashboard with real-time insights into occupancy rates, access logs, and energy usage.

2 Usecase Diagram

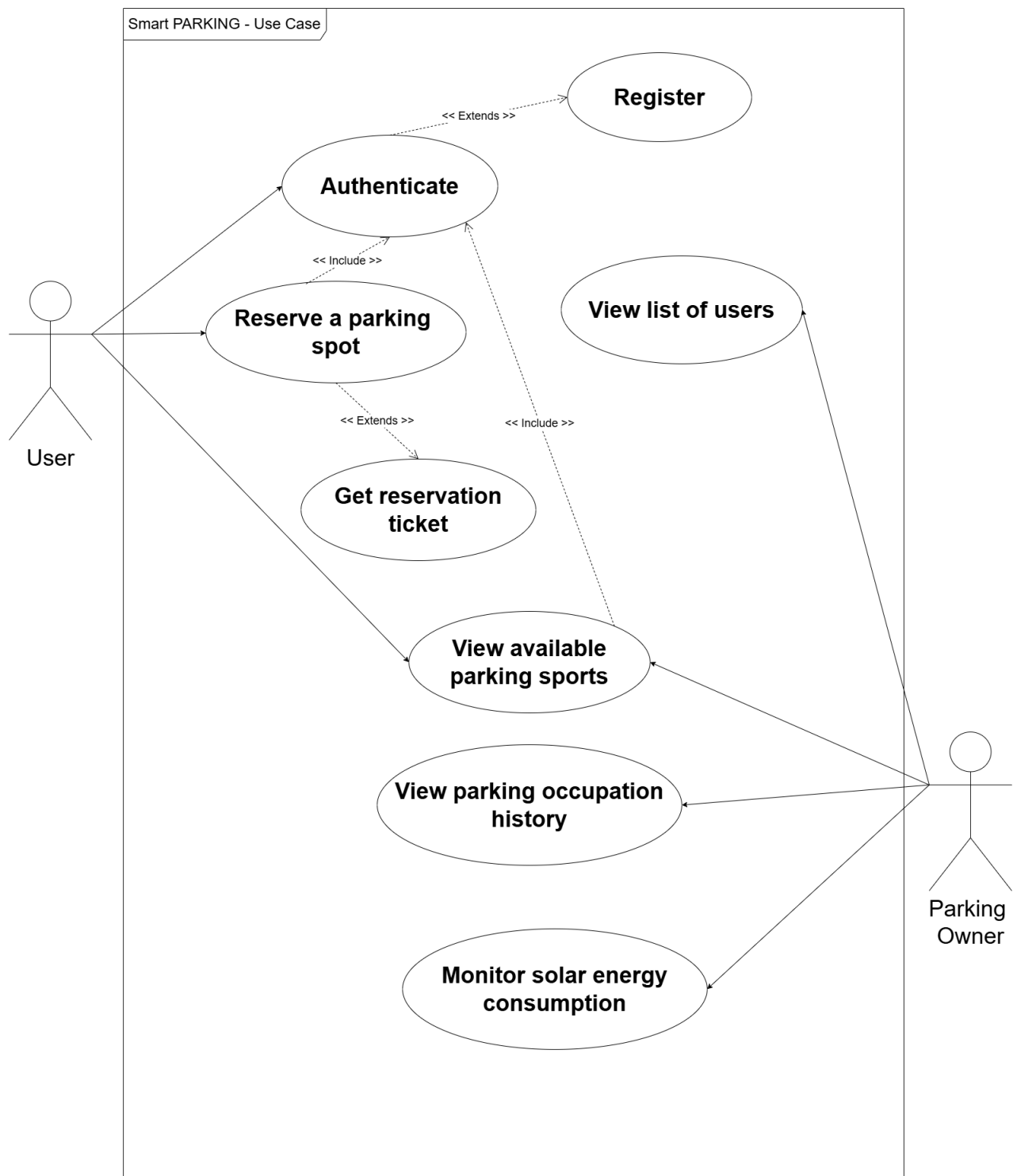


Figure 1: Use Case Diagram

3 Class Diagram

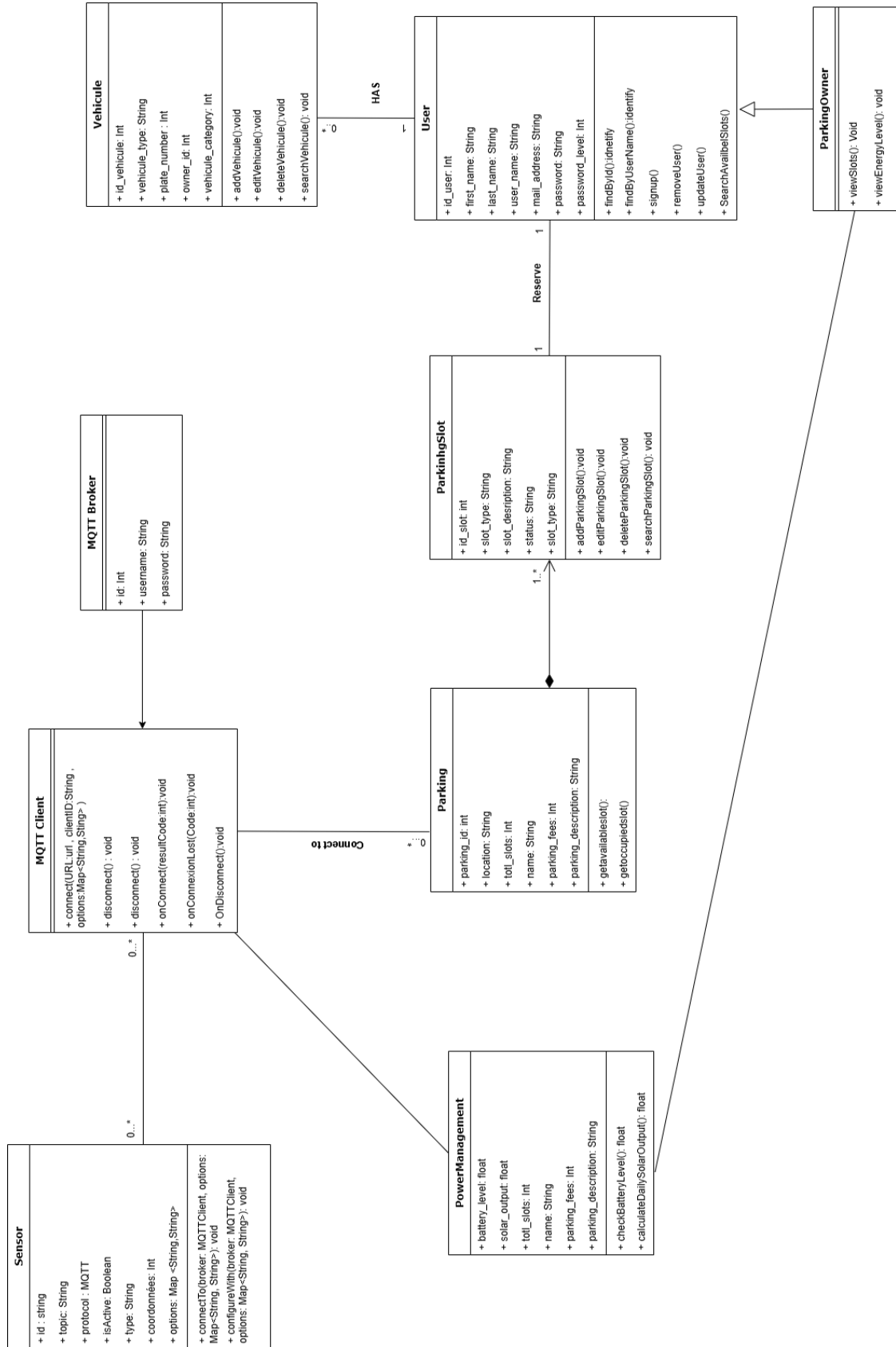


Figure 2: Class Diagram

4 Deployment Diagram

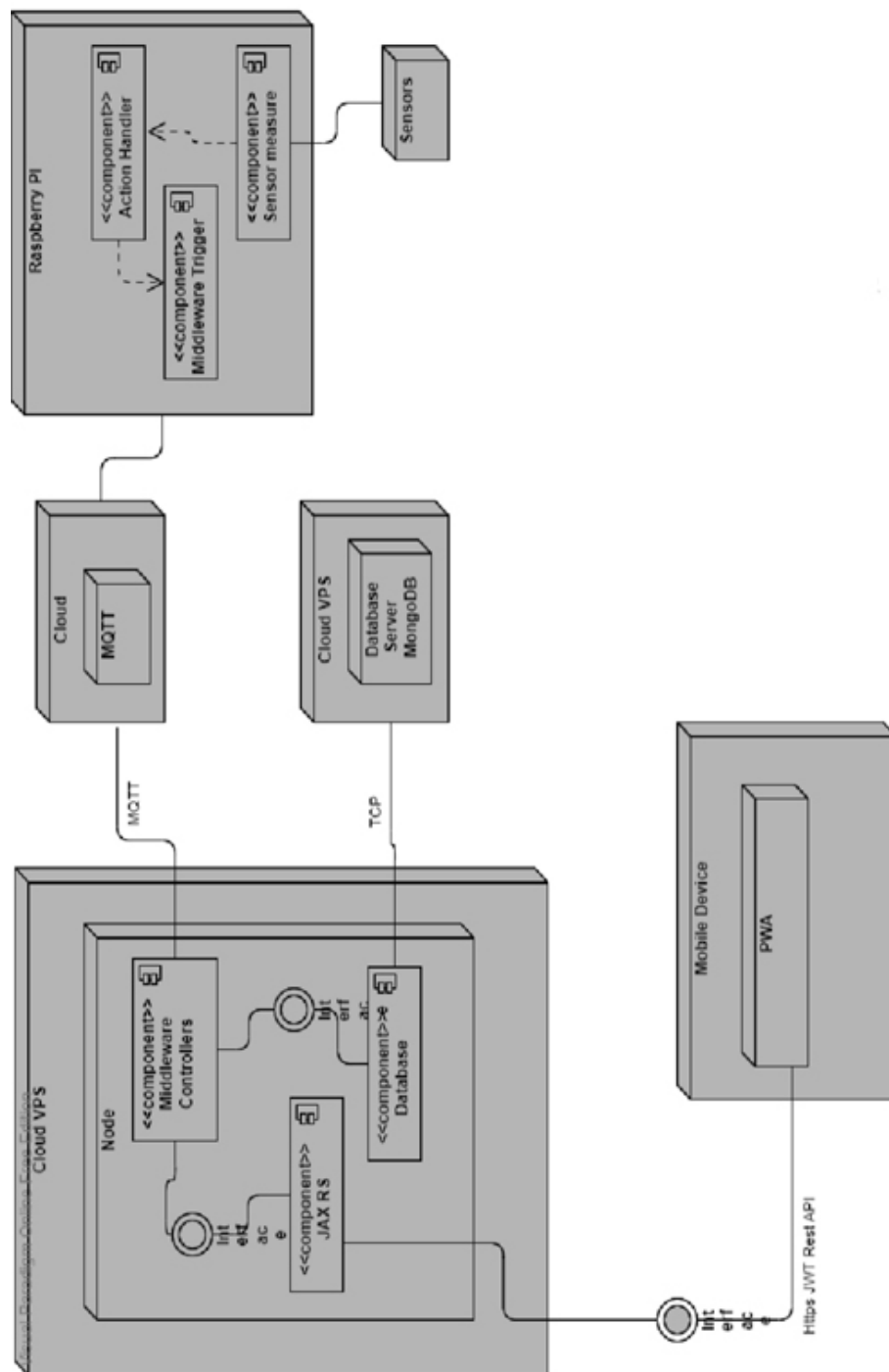


Figure 3: Class Diagram