DIGITAL PARKING APPLICATION

Group number: ONE

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A. Introduction

A1: What is Digital Parking Application?

Digital Parking Program (DPA) is a product of Group One. Group One Enterprise is one of the world's leading providers of digital and hybrid parking SAAS solutions for high-traffic organizations and locations parking space allocation solution. We are the world's first app and planner, as well as mobile booking with AI recommendation, parking spot sensor and map. Our integrated software solutions are connected and designed to help business owners, corporate bodies, their security personnel, and their customers in solving parking space problem. DPA is expected to reach a market value of $19.9 billion by 2025. We integrate business applications and IoT tools to provide a unified and connected experience (in parking lots). We offer a hybrid parking experience.

A2: Why is Digital Parking Application being developed?

We have seen people recognize the need for hybrid car parks and parking spaces. Companies/organizations want an automated parking management system, we have developed a solution using AI and IoT to develop a software application to solve this problem. The actual conversion to hybrid parking was confirmed after the pandemic, when the need for social distancing, employee safety and self-service were in high demand. The need to not search for storage space for an event, flight or purchase gave rise to this idea and speeds up the use of our application. The DPA can be used by any organization that needs hybrid and connected parking, such as sports halls, meeting rooms or other facilities that entertain many people.

B. …

Capabilities	Why—explain:
Booking Space	

1. **AI powered License plate scanner**	Using an AI scanner, the customer's license plate is scanned at the entrance of any business that has our app sensor installed in their parking lot. This automatically compares the information provided during registration and allows the customer to access a parking space.
2. **Slot Location Map**	With our built-in location map, like Google Maps, it helps customers locate where they may park without the hassle of parking attendants.
3. **Wrong parking sensor**	With our application sensor installed in the parking lot of any organization or company, it helps to limit the wrong parking of customers on a location or space not designated for them. The sensor of each parking space automatically scans the license plate to make sure that it has the right car. If the location is wrong, it will trigger an alert on both the app and the security screen. (The sensor may have the size of weight lines that form the spaces of lots of car parks but can be replaced with plastic sensors.)
4. **Service Request**	With this function, our clients can request for servicing of the sensors on the parking lot to see if there is any problem. On the other hand, Customers can request additional services that they feel they need on the new parking application they are using. Or any other service we will provide in the future.
5. **Security Engagement**	There is little or no commitment to security if a company installs our application. During wrong parking, company security will be alerted immediately by sensor which can trigger software alert in their office to go to zone 1, zone 5, location 15 to check if who parked in the wrong area and ask to park in their designated parking areas.

C. …

C1. Stakeholders

Stakeholder	Why related?
1. WALMART	In Big retail stores like Walmart, Costco, the Home Depot, Aldi, Meijer, Ikea etc, they typically have big parking lots, because of their large in person customer base and car traffic. By using our digital parking app, it will help them to co-ordinate, monitor and curtail how the spaces are used. If sensors are on the parking lot. The reckless discard of shopping cart by customers will be reduced to a barest minimum. The parking space perimeter will

	be secured due to the sensors on the parking lot. And so on.
2. AIRPORTS	One of the reason people take uber and other taxi options to the airport is because of lack of availability of parking space The first challenge for the passengers is finding a parking spot. This will be simplified using the Digitalized Parking Space app. Using artificial intelligence, the app displays available parking spaces at the airport parking lot Using artificial intelligence techniques, pricing is determined depending on the number of times the customer will be taking. An overnight car stay is way cheaper than a drop off.
3. STADIUM	Just like the airport, a stadium is another place that has a large in person and vehicular traffic. Ranging from tournaments to regular exercise by people. With the use of our DAP, the management of stadiums will have everything going on at their parking space on the tip of their hand through their phone. Through our services features, booking a space for tournament automatically reserve a sit for the customer for the event. That way the event tickets can be sold easily, and revenues will be generated.
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C2. Benefits

Business Owners and parking users can both benefit from smart parking solutions, which are crucial. They support effective parking management and have the potential to change and advance the whole parking sector. Real-time vacancy analysis is done by AI-based smart parking solutions using hardware and software.

Identified benefits (from)	Justify/ explain why:
1. Automated License Plate Recognition (ALPR) / Automatic Vehicle Identification	The ALPR system automatically grants access to the parking lot after scanning and reading the license plates. It uses optical character recognition and ALPR cameras to operate. This is one of the smart parking systems with AI developed by BMW for North American customers. Business Owners can decide who has access to their parking lot and when. With an ALPR parking system, you can give your customers the access they need.

	Customers' information is saved during their registration on the app and thanks to the intelligent parking system, the entire process becomes easier to manage. To avoid pressing the button, getting a fine, etc., the parking solution can quickly detect the car and allow automatic access. It uses an automatic parking system. Therefore, parking becomes easier, and the movement of cars becomes faster.
2. Real-time parking occupancy and availability	The number of parked cars and empty spaces in the parking lot can be calculated using IoT techniques. It detects if a vehicle is present at the location and notifies the management platform. The fact that this AI-based solution collects and formats data in real-time is its strongest feature. Any parking manager, analyst or decision maker can always improve the existing parking management plan. This real-time information about parking space availability and occupancy can be viewed or researched later. Real-time parking information allows users to locate their parking space and avoid searching for empty spaces. This application provides users with up-to-date information on the availability and occupancy of parking spaces. Users can easily find parking spaces and save themselves the time for navigating traffic and searching for open spaces.
3. Predictions and forecasts on the parking occupancy rate	An algorithm that can automatically predict parking status and future parking occupancy is also part of smart parking solutions. It uses historical data analysis to enable independent learning. By considering the weather, day of the week, rush hour and traffic levels in the area, the app can predict future demand for parking.
4. Dynamic pricing	Due to the number of customers coming and going from these businesses, prices are generated using artificial intelligence based on location, availability, and frequency of use. For large retail stores, the traffic through the parking sensor will generate income for the

	companies through a smart contract signed by them and our company. in India, the stadium charges a fee for cricket matches, this generates revenue for the state sports body. This is also applicable to the airport parking lot.

D. ….

User Story	Acceptance Criteria	Explanation/ Justification
1. **As** a business owner, **I** want to always have easy access to my parking lot, **So** that I can monitor the parking lot in real time with my mobile device or desktop.	**Given** that I'm a business owner with a Digital Parking Application owner account **When** I log into my account via my mobile device or desktop **Then** I can view and monitor activities in the parking lot	As a business owner concerned about his parking lot (as we've seen with Walmart and RVs, stadiums and clubs, airports, and theft), he wants to monitor the parking lot in real time with his phone. This helps him to make quick decisions.
2. **As** a business owner, I want to be able to easily assign a parking spot to my customers **So** that my customers can perform their parking activities quickly and efficiently.	**Given** that I'm a business owner with a Digital Parking Application owner account **When** a customer drives into the parking lot, I want to easily and quickly assign a parking lot based on the characteristics of their vehicle **Then** the customer can park quickly and conveniently	With a spatial map of every vehicle entering the parking lot, owners can track who entered and when. The uniqueness of the map makes it difficult for squatters to occupy a space in the property.
3. **As** a business owner, **I** want to be able to have cars parked at their designated location from the comfort of my office.	**Given** that I'm a business owner with a Digital Parking Application owner account **When** drivers are assigned parking spots in the parking lot	With a designated spot, cars can't park where they fit. Not only does this give the parking lot a proper look, but it also helps customers know where their car is.

	So that parking spaces can be used efficiently	**Then** I can monitor the parking lot to ensure that drivers park in their designated parking area.	
4.	**As** a business Owner **I** want my parking attendants to be able to detect wrong parking by a trigger on their mobile device **So** that they can approach the erring driver and enforce a re-park	**Given** that I'm a business owner with a Digital Parking Application owner account **When** a customer with a designated parking area, parks in an unallocated parking area **Then** the parking attendants will receive a trigger on their mobile device and alert the erring driver, getting them to park appropriately	The owner wants to know that his security personnel can easily find a mule and immediately remove it. It helps the security guards to do their job more easily and interact less with the customers.
5.	**As** a parking customer **I** want to be able to drive into a parking lot and quickly receive notification of my designated parking area **So** that I can quickly park my vehicle.	**Given** that I am a customer with a Digital Parking Application Account **When** I drive into a parking lot **Then** I should receive notification of my designated parking area **And** I can park my car quickly	
6.	**As** a business owner **I** want to be able to generate reports on historical customer parking trends **So** that I can forecast customer parking demand and plan for parking attendant deployment.	**Given** that I am a business owner with a Digital Parking Application Account **When** I log into my user account and select 'generate transaction reports, filtered to days of the week' over a 6-month period **Then** I should be presented with a transaction report, outlining; - Transaction per day - Vehicle types parked - Average length of stay	
7.	**As** a business owner **I** want to be able to generate reports on historical customer erroneous parking trends **So** that I can identify the frequency and remote causes of the erroneous parking	**Given** that I am a business owner with a Digital Parking Application Account **When** I log into my user account and select 'generate transaction reports, filtered to instances of erroneous parking over a 6-month period **Then** I should be presented with a transaction report, outlining; - Number of erroneous parking instances per day	

	- Vehicle types parked - Customer type	

Reference

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