

White Paper



Intelligent Parking System

*Cost-Effective and Fully Automated
Management*

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EXECUTIVE SUMMARY

Life after dusk has seen a steady increase in popularity among people over the last few years. With the dawn of night markets and night life, we can notice an increase in the number of people using their own vehicle for commuting rather than depending on the public modes of transportation. This increase in vehicles has in turn led to the need for 24 hours parking spaces.

The government has passed new regulations which require shopping malls to have their parking lots open during the nights. One of the main problems to abide by this regulation would be the tremendous increase in labor and cost. Safety of these cars is also a major concern especially during night hours.

Vehicles are identified by their license plates, which is easily identifiable for humans and now for machines. Various recognition softwares have been developed today to identify vehicles via license plate recognition, and are used for a variety of traffic and security applications such as parking. When a vehicle enters an input gate, license plate is automatically recognized and stored in database. When a vehicle later exits the parking area through an output gate, the license plate is recognized again and paired with the previous information in the database. Using this technology, we can calculate the parking duration for that vehicle.

One of the major contenders among these softwares is IPS (Intelligent Parking System). IPS has had an overwhelming response in other countries and has been installed in various parking spaces in malls, hospitals and offices. It reduces human intervention, labor and at the same time makes the parking process more efficient. By installing this software, the parking spaces can be made 24/7 functional and at the same time reducing cost and increasing security for the vehicles.

INTRODUCTION

As a part of the booming development of the city, night markets and night life are becoming more popular around the states. Night life is also increasing its popularity among tourists. At the same time, the tourism industry is showing significant expansion. These factors led to an ever-growing demand for 24 hour parking spaces, especially during the night.

According to a survey from the Fashion magazine, there has been a 33% increase in the number of people spending their night hours around these night markets. The streets around these markets are too narrow to make room for parking lots especially with the rise in the number of vehicles and vehicular congestion.

33% increase in number of people visiting the markets at night.

Government regulation mandating that parking lots to be opened during the night.

IPS can provide an ideal solution to meet demand and regulations in an efficient manner

With the rising demand for parking spaces, a government regulation has been released that requires shopping malls to open their parking lots to the public during nights. To comply with the regulation, malls have to invest in more human resources to manage and maintain the parking lots. An intelligent parking system can help lower the budget associated with the additional labor cost.

The goal of the white paper from Digital Mammon Technology is to educate parking lot providers about the benefits of Intelligent Parking System as a cost-effective and fully automated management solution to comply with current and future regulations.

IPS TO REDUCE LABOR COST

The Intelligent Parking System (IPS) has been applied to the transportation management system around the world since 2013, to implement automated vehicle recognition, reducing labor cost considerably. ⁱ

With the development of various recognition techniques, the identification of vehicles via license plate recognition is widely used for a number of traffic and security applications. In some countries, the technology is used on country borders to detect illegal crossing. In traffic control, vehicles can be directed to different lanes for a better congestion control during rush hours. ⁱⁱ

How IPS Works

The IPS is designed to automatically recognize vehicles without manual intervention. The core technologies used in the construction of a license plate recognition approach are image processing, artificial intelligence and machine vision.

The system consists of a database, image capturing devices and a central server. The database and central server are integrated together in the equipment room. The recognition devices are installed at every entrance and exit of the parking lot.

When a vehicle passes through the entrance, its license plate is captured and automatically recognized. The result will be stored in the database. When the vehicle exits, the license plate is identified again and paired with previous information in the database. Using this, the parking duration is determined. Along with this the parking fee will be calculated and charged. The whole process is automated and does not require human intervention.

The installation of the whole system takes less than 3 hours within system configuration and hardware mounting.

BENEFITS OF THE IPS

The intelligent Parking System has a number of benefits. Some of them which we have already seen are that it can provide 24/7 service with no additional costs or labor required. Some of the other main benefits of the system are:

- The whole process does not require any manual operation. Only one system administrator will be needed on duty in case of server issues or if someone manually tampers the system.
- The vehicles can pass through the gate without stopping for a ticket, which is highly beneficial for increasing efficiency. Traffic congestion at toll gate has proved to be very dangerous especially when the entrance has a steep slope.
- The database can distinguish between vehicles of staff from those of the customers. In this way, the staff can have easier and faster access to the parking lot.
- It simplifies the management procedure, eliminating the need for IT personnel to monitor or manipulate the system. Once installation is completed, it only requires a very small cost for maintaining the database.

CASE STUDY/ APPLICATION

Central Mall is a shopping center open from 10 a.m. to 10 p.m. near the Central Night Market. The mall has an underground parking lot with a capacity of 500 parking spaces, now open to the public in the night since the regulation was released.

From data provided by Central Mall, it is estimated that the average utilization rate is 90% and 60% during the daytime and night respectively before the IPS is adopted, and rises to 95% and 70% after the system is used. The IPS not only increases the utilization also reduces the labor cost to a great extent and helps in increasing the healthy profit, as shown in Figure 1 and Table 1.

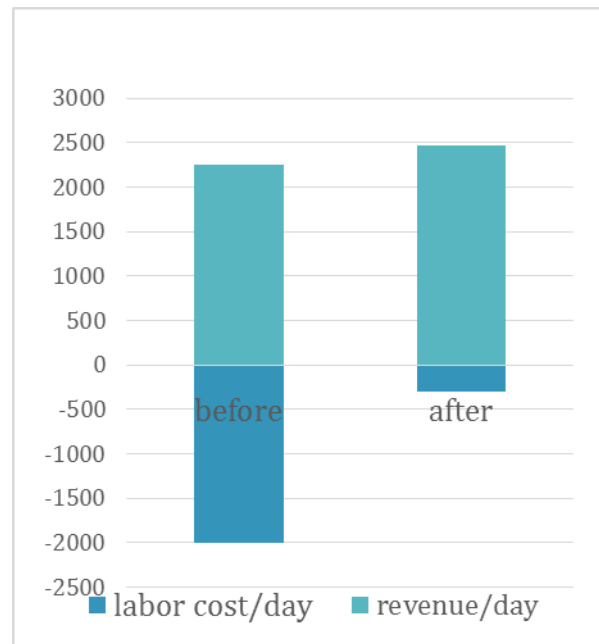


Figure 1. The Profit of Central Mall Parking Lot before and after Using IPS

Dollar/day	Revenue	Labor cost	Profit
Before	2250	2000	250
After	2475	300	2175

Table 1. The Revenue, Labor Cost and Profit

CONCLUSION

With the increasing demand and desire among people to park their cars in a more flexible, convenient and safe location, parking lot providers should no longer ignore IT systems as a potential source for cost reduction and higher benefit. IPS (Intelligent Parking System) plays a wonderful role for managing parking lots cost-efficiently. IPS has got several advantages over any usual parking lot management schema:

- **Less manual operation involved** — The entire parking fee calculation and collection process is done by the system. The toll collectors are no longer needed by the parking lot providers. Instead only one system administrator needs be employed.
- **Less time spent for parking** — Stopping for issuing of tickets will not be involved any more. People can go through the gate without waiting in lines, which will be a more time-efficient especially during heavy rush hours.
- **Less maintaining cost** — The system is fully automated. Once the system is installed, it does not need to be monitored. Maintaining the databases also involves very less cost and time.
- **More Profit** — Reduction in management cost and increase in income from parking fees results in a higher profit for parking lot providers.

For more information on Intelligent Service Provider or Digital Mammon Technology, please visit our website at www.DigitalMammonTech.com or contact us at 1-888-354-0909 or via email at sales@DMT-inc.com.

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