SMART CAR PARKING MANAGEMENT SOLUTION
USE IP CAMERA WITH AI TECHNOLOGY

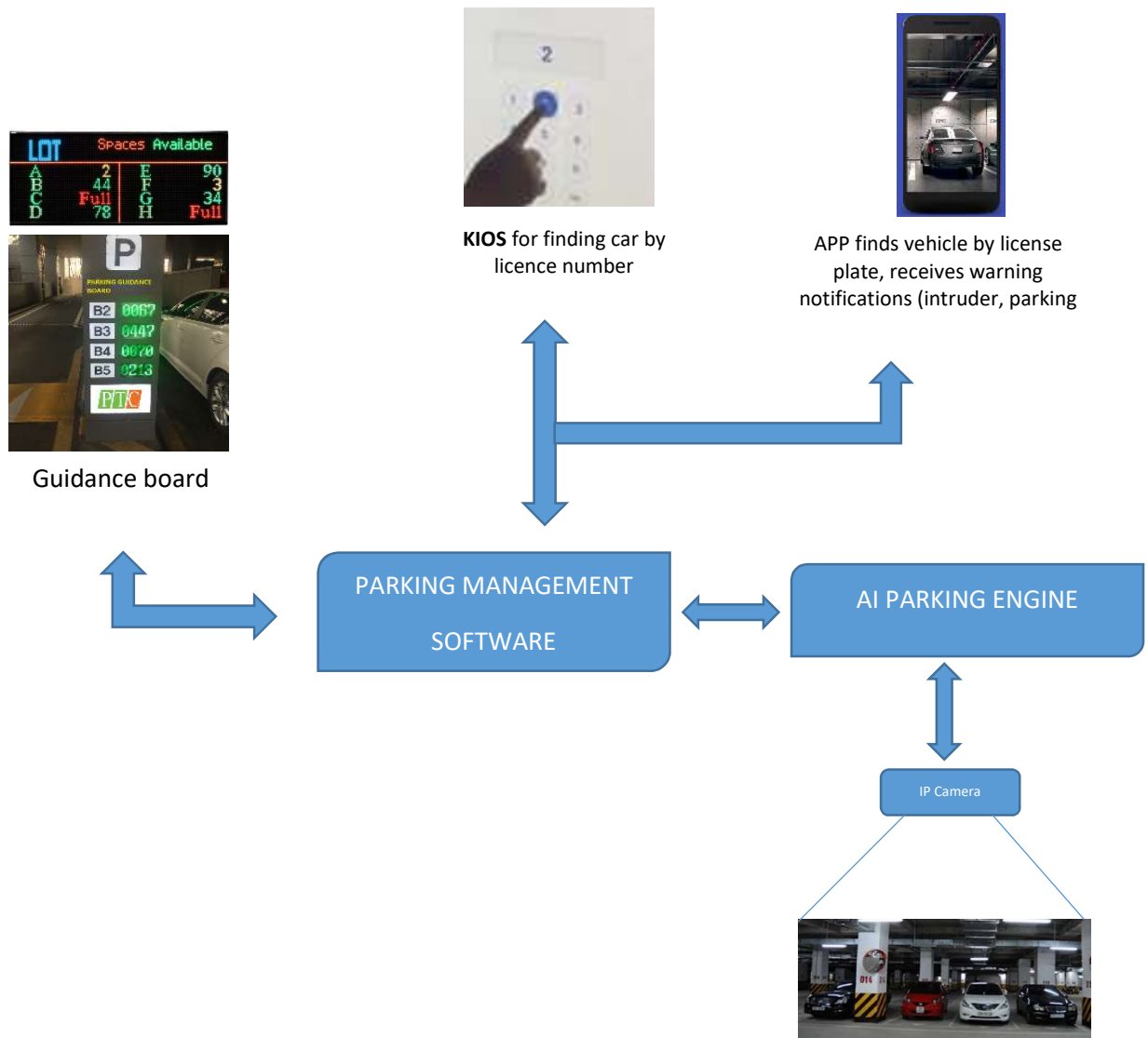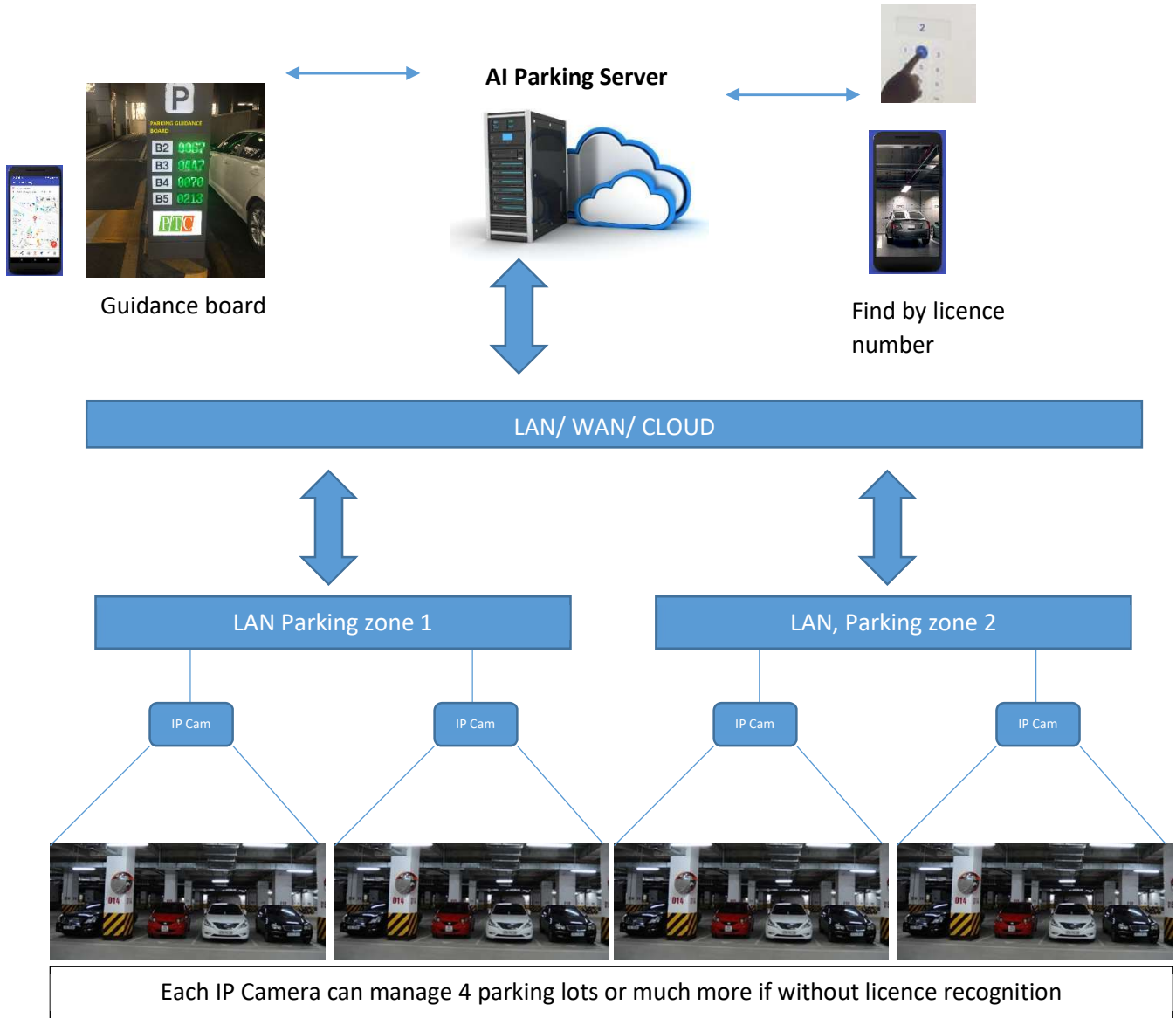## Contents

1/ TARGETS

- Determine the status for each parking location

- Notify and instruct drivers to find a place to park

- Determine vehicle type, brand, vehicle color... to filter for search

- Notify guards and drivers with photos (via APP) when a stranger enters the vehicle

- Advanced options: Read license plate if a camera is installed to directly observe the license plate

o Enter the license plate on the App, information Kiosk to find and guide to the parking location, have a photo of the license plate for comparison

o Enter license plate number to retrieve video clips during parking time for tracking purposes

- Record when a car is parked and there is an intrusion (someone approaches the car)

2/ SYSTEM MODEL
LOGICAL MODEL

KIOS for finding car by licence number

APP finds vehicle by license plate, receives warning notifications (intruder, parking

Guidance board

PARKING MANAGEMENT SOFTWARE

AI PARKING ENGINE

IP Camera

NETWORK CONNECTION MODEL

Guidance board

AI Parking Server

Find by licence number

LAN/ WAN/ CLOUD

LAN Parking zone 1

LAN, Parking zone 2

IP Cam

IP Cam

IP Cam

IP Cam

Each IP Camera can manage 4 parking lots or much more if without licence recognition
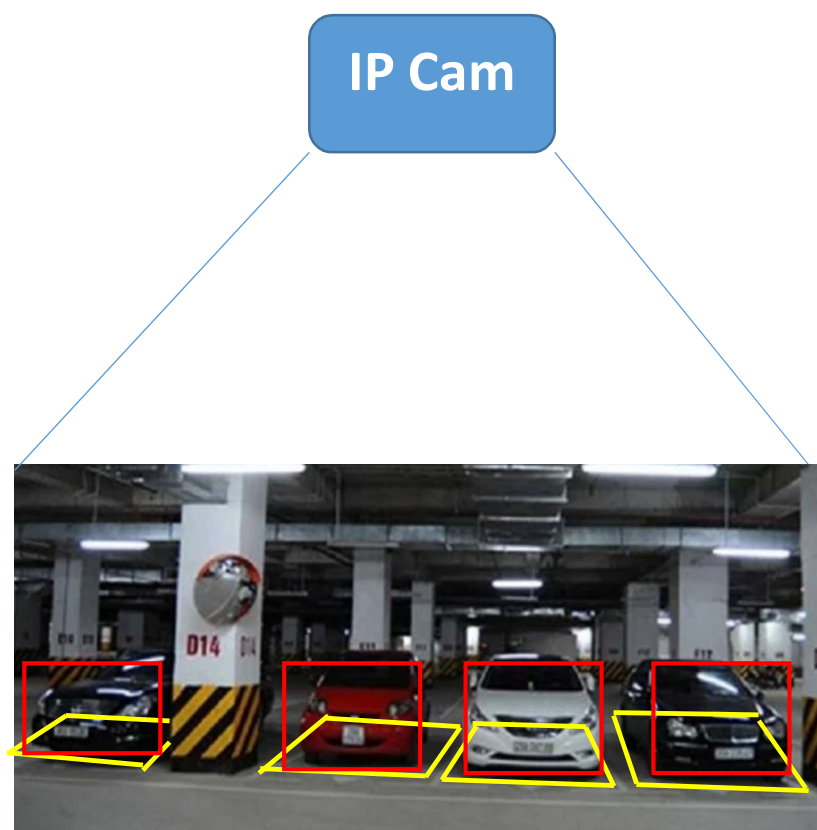
3/ Overal solution

3.1 Detect parked vehicles, read license plates

Each camera monitors many parking lots (from 4 to 50 parking lots), more or less depending on specific cases. For each camera, the software allows drawing the area to be detected (yellow area). When a parked vehicle is detected, mark the location where the vehicle is parked, and proceed to record... until the vehicle leaves the parking location. At least 1 parking location has a vehicle, the corresponding camera will record Similarly, the software also allows drawing the area that needs to be cropped to read the door license plate of each parking location (red area). When detecting a parked vehicle, identify the license plate and save the license plate image for visual identification - in case of incorrect reading of the license plate
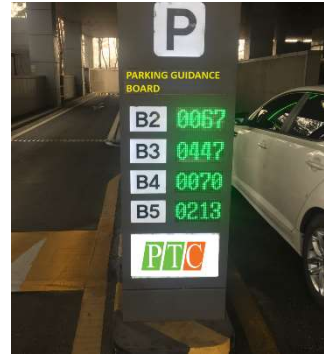
3.2 Parking guidance

At the entrance to the parking lot or parking tunnel, one or more signboards are arranged to provide information for drivers to find the most convenient parking place. Depending on needs, provide appropriate information, including the following types of information:

- Number of vacant positions for each area and basement

- List details of one or several suggested (or required) locations for drivers to park in the correct location

Drivers (regular) can use the APP to view the above information without having to look at the board

For parking services with multiple parking lots, the APP finds and guides the nearest parking lot
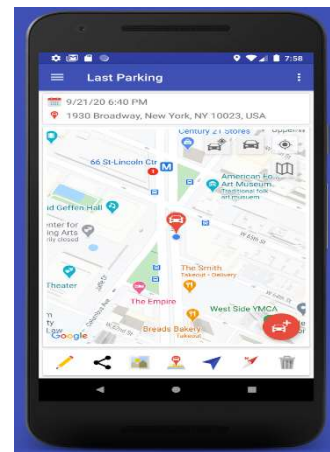
3.3 Find car

When the driver cannot remember where he parked his car, enter the license plate number at the car finder kiosk to be guided to the easiest parking location.
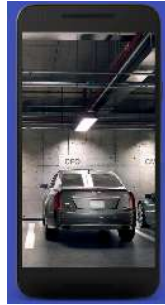
Drivers can use the APP to enter license plate numbers to search similar to the Kiosk.

APP finds cars by licence number

KIOS finds cars by licence number

4/ Consultance

Thank you for taking the time to view the solution content.

If you are interested, do not hesitate to contact us for advice and to design a parking management system suitable for today's most modern technology.

This is a pure Vietnamese artificial intelligence technology solution - implemented by Vietnamese programming experts.

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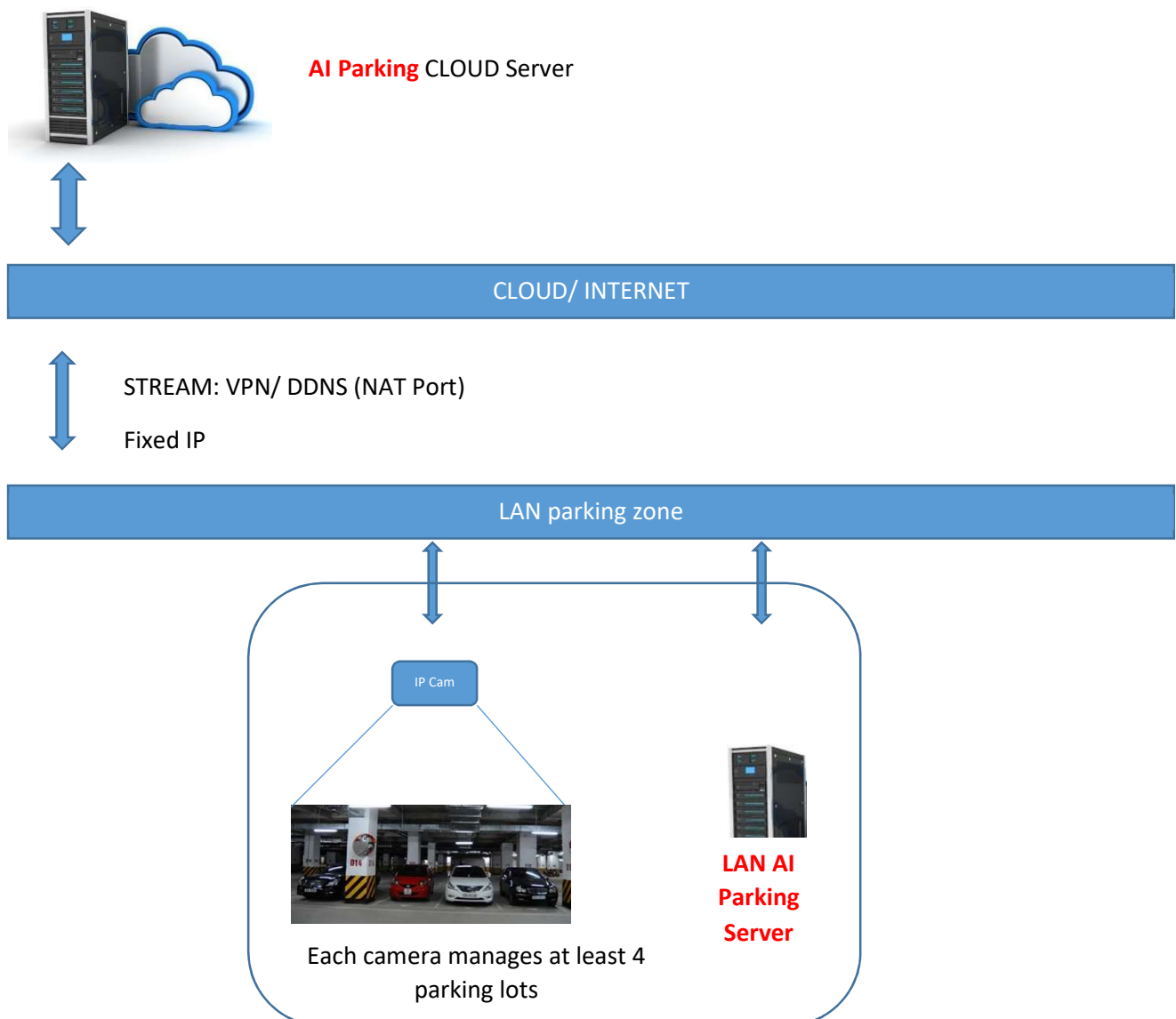
5/ Sample models

5.1 Core of AI Parking

The AI Parking core consists of two basic components: IP camera and AI Parking Server installed with AI Parking software core. The AI Parking server can be a machine on the same internal network (LAN) as the IP camera or a Cloud server on the internet. When the AI Parking server is a Cloud server, the network infrastructure must ensure that the cloud server can connect to the STREAM IP address of the IP Camera.

With IP Camera: If only managing parking locations, 1 IP camera can manage up to 50 parking locations (if the surveillance camera frame covers all 50 parking locations to be managed). If using the license plate reader function, 1 camera should only manage 4 parking locations. You can use 2 Heads cameras to double the vehicle management position at a more economical cost than using 2 cameras.

With internal AI Parking server: Standard server configuration can connect an unlimited number of cameras

With AI Parking cloud server: Ensure STREAM communication, normal ADSL internet connection can meet 10 cameras/parking lot. Depending on the capacity of the internet connection in the parking lot, the number of cameras can be increased for this case.

AI Parking CLOUD Server

CLOUD/ INTERNET

STREAM: VPN/ DDNS (NAT Port)

Fixed IP

LAN parking zone

IP Cam

LAN AI Parking Server

Each camera manages at least 4 parking lots

5.2 Model 1: Internal network AI Parking Server (LAN AI Paking Server)

Cloud server

APP:
- Find available parking lots
- Find parking location at the lot
- Find vehicle by license plate number

Manage via internet

INTERNET/ CLOUD

Parking zone LAN

IP Cam

Parking guidance boards

Each Camera can manage more than 4 parking lots

AI Parking LAN Server

Kios for finding cars by licence number
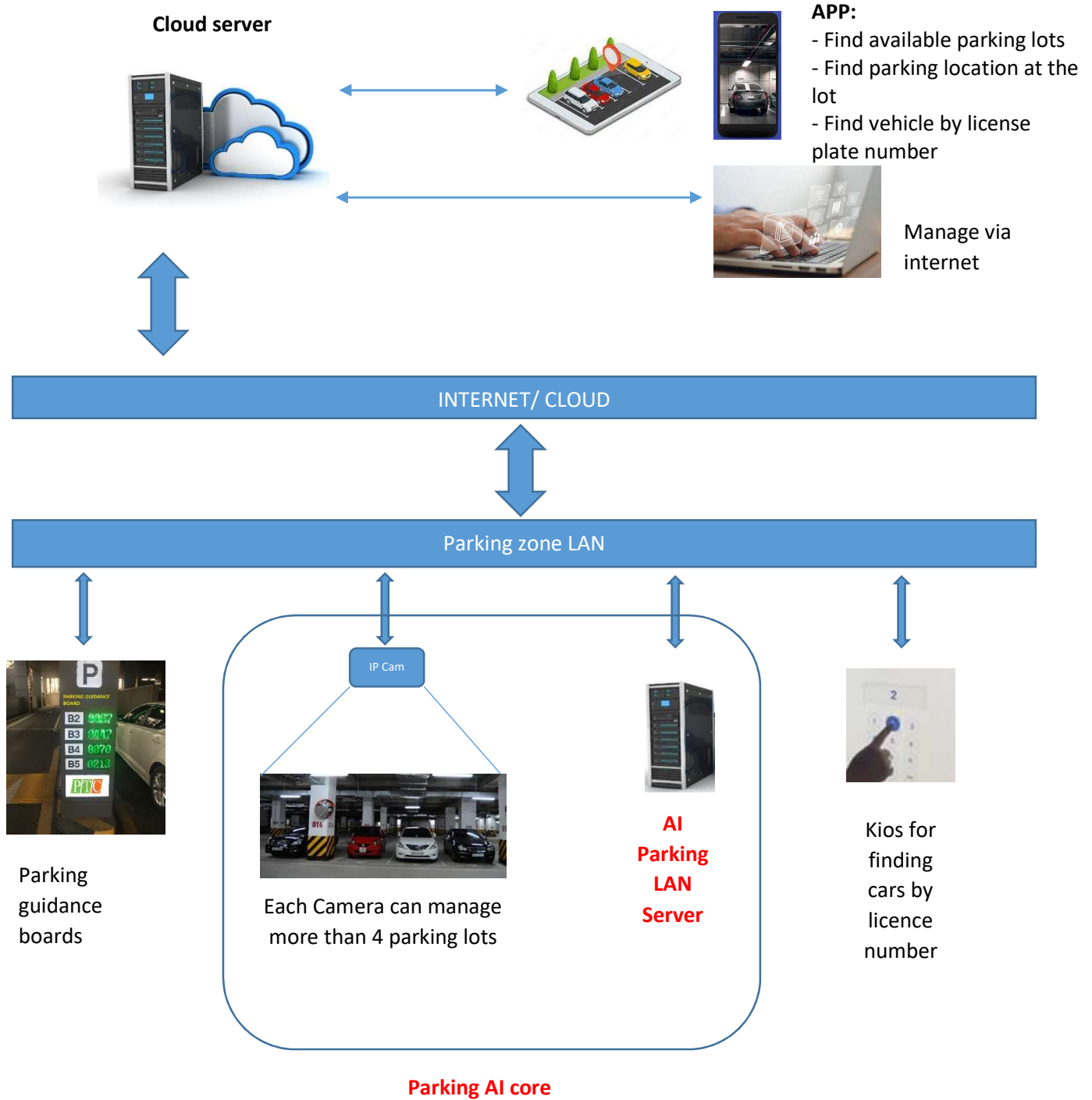
Parking AI core

5.3 Model 2: AI Parking Cloud Server (AI Parking CLOUD Server)

AI Parking CLOUD Server

Parking AI core

APP:
- Find available parking lots
- Find parking location at the lot
- Find vehicle bv license

Manage via internet

INTERNET/ CLOUD

AI Parking LAN

IP Cam

Parking guidance boards

Each camera can manage at least 4 parking lots

Kios for finding cars by licence number

5.3 Model 3: LAN mix CLOUD AI Parking Servers

Máy chủ cloud

APP:
- Find available parking lots
- Find parking location at the lot
- Find vehicle bv license

Manage via internet

INTERNET/ CLOUD

Car Parking LAN 1

LAN n..

IP Cam

Parking guidance boards

Each camera can manage at least 4 parking lots

LAN **AI** Parking Server

Kios for finding cars by licence number

LAN **AI** Parking Server

AI CORE