Technology: Internet of Things Name: ponsivalingaraj

Title: Smart Parking project Date: 10/09/2023

Phase 2: Innovation(smart parking)

Technology is the digital age. Since the invention of the microchip in 1958 technology has been on the rise to facilitate our way of life and living. The foundation of this innovation is *data*.

Data is our digital footprint, our breadcrumb trail. To make advancements in our digital innovations–to improve our cities and lifestyles, data is:

- Collected
- Mined
- Analyzed
- Applied.

1. Smart parking sensors

The idea is simple: install sensors throughout the city that communicate with an app to help drivers find free parking spots.

The realization, not so much: the ground needs to be dug up to install these sensors. **Inner city construction is notorious for creating traffic backlogs.** The project will also *reduce* the number of available parking spaces during construction. It's a project where the visionaries need to think in the long run. **Focus on the outcome rather than the process.** The local council will need to create a campaign to notify the public about the projected plan and objective.

Major cities such as San Francisco, Singapore, and Berlin already employ this technology - the pioneers of smart parking innovations.

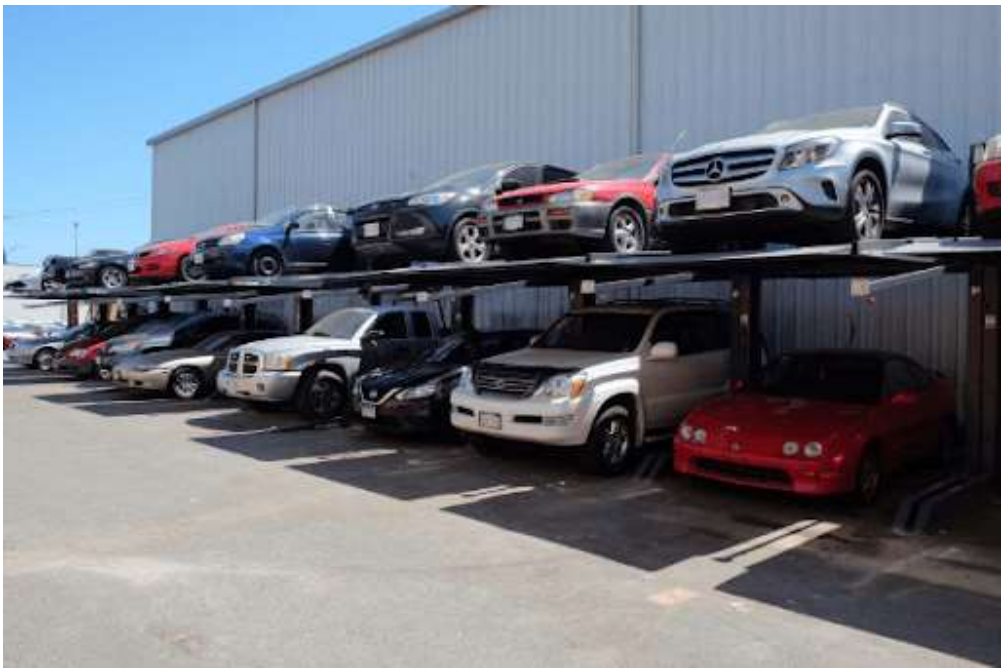
2. Parking applications

Free parking apps are a *dream come true* for all car owners. The major apps available offer:

- Space availability

- Space reservation
- Reservation in advance
- Flexible reservation times
- Payment options - in advance
- Top-up payment options
- On-street, public, and private parking spaces
- Times-up reminders

3. Stacked parking



Double-decker parking solutions do just that–double your parking space. Their technology uses a simple elevation function. When you find your spot, you drive onto a ramp. When you exit your car you can flip a lever for the ramp to raise.

This frees up a parking space underneath.

The downside to this is a higher level of *organization*. For employers, it's best to allocate parking spaces so those who leave later park first. This allows a smooth transition for car owners who leave earlier.

These options work best for:

- Car dealerships
- Mechanic workshops
- Ferry crossings
- Private residences

- Robot valet parking (more on this below)
  The conception is indeed smart, but the realization can be tricky. The onus is to first *identify* your need, *evaluate* the current parking timings, and *proceed* to choose the best solution.

4. Subterra parking lifts

This smart parking solution is designed with homeowners in mind. After you park your car in your garage and exit it, **your car is lowered to a subterranean space**. Many private homes come with basements and underground garages. Store your cars here, choose which one you prefer to drive, mount the lift and drive away without a congested driveway.

Also popular with inner city parking garages. Employing *automated parking valets*, they can now utilize underground space without needing to spend too much on human navigation.

Your car will be automatically transported to an available parking spot underground, possibly tiered, optimizing space to the max, but more on that below.

5. Reduced fees for EVs

This innovation for smart parking promotes the use of electric vehicles. An objective for smart cities is to reduce carbon emissions. Therefore, it makes sense to offer lower parking rates for EVs. Smart move.

In conjunction with smart parking apps and designated EV charging stations, you can brave inner city parking with your EV.

If you don't need to charge your car each time you park it, you can apply for a residential parking permit at a *reduced cost*. There's no one price however, it fluctuates depending on local councils, but definitely worth looking into.

6. Robot valet parking

According to IEEE, Robotic Valet Automated Parking Systems (APS) is a viable solution to the parking problem. Designed initially for dedicated parking lots, **the**

automated parking service saves car owners time and gas looking for available space.

When you enter the lot you drive your car onto a sort of loading dock. With the help of an app, you can leave your car and let the robotics do the rest.

The dock automatically transports your car to the nearest free space. This reduces accidents, saves space, can use parking lifts, and boosts the overall efficiency of the parking garage.

In the unlikely event of any mishaps, the services of a dedicated car accident lawyer are readily available to provide expert guidance and support.

7. Solar panels parking shades

Source

Marrying smart parking and renewable energy, this innovation is just the tip of the iceberg. For outdoor parking lots, installing solar panels as shades offer the following:

- Parking safe from drastic weather conditions
- Reduced opportunity for bird dropping to dirty your car
- Production of energy while optimizing space

Lot owners can feed the energy back into the grid and benefit from local tax cuts. Or, if the parking area is operating an APS they break even with energy consumption.

These schools in California benefitted from reduced electricity fees for up to 20 years. Smart parking innovation at its finest! And it instills a sense of green forward-thinking in the students too to boot.