

SMART PARKING SYSTEM WORKFLOW

Phase 1: Research & Planning (Week 1-3)

Goal: Validate the problem, define the solution, and outline the business model.

1 Market Research

- Study existing parking issues in Kathmandu (conduct surveys/interviews).
- Identify high-demand locations (Thamel, New Road, Putalisadak, etc.).
- Analyze competitors (any existing parking apps?).

2 Define Business Model

- **Free Model:** Users search parking spots for free.
- **Freemium Model:** Charge parking lot owners for premium features (real-time monitoring, online payments, etc.).
- **Commission-Based Model:** Take a percentage of prepaid parking bookings.

3 Technical Research

- Determine which IoT sensors to use for detecting vacant spots.
- Identify the best way to integrate sensors with a cloud-based database.

 **Outcome:** A clear business model, problem statement, and technical feasibility report.

Phase 2: Prototype Development (Week 4-8)

Goal: Build an initial version of the app and IoT system.

1 Parking Box IoT Device (Hardware & Software)

- Use ultrasonic or infrared sensors to detect car presence.
- Connect sensors to a microcontroller (ESP32, Raspberry Pi, or Arduino).
- Send real-time data via WiFi or GSM (SIM module for areas without WiFi).
- Store and process data in a Firebase or AWS IoT system.

2 Mobile & Web App (For Users & Parking Owners)

User App Features:

- Search & find nearby parking spots
- Real-time parking availability
- GPS navigation to available spots
- Online booking & payments (Khalti, eSewa, FonePay)

Admin Dashboard (For Parking Owners)

- Track occupancy in real-time
- Set prices for parking slots
- Earnings & analytics

🎯 **Outcome:** A basic **MVP (Minimum Viable Product)** with real-time parking detection.

Phase 3: Testing & Deployment (Week 9-12)

Goal: Test the system with real users and refine it.

1 Pilot Testing 🚗

- Deploy **5-10 parking boxes** in selected parking lots.
- Test **sensor accuracy** & app performance.

2 User Feedback & Improvements

- Get input from parking owners & drivers.
- Fix bugs & improve UI/UX.

🎯 **Outcome:** A stable, functional system ready for scaling.

Phase 4: Expansion & Monetization (Month 4+)

Goal: Scale the business & generate revenue.

1 Marketing & Partnerships

- Partner with **malls, restaurants, and businesses** for exclusive parking solutions.
- Promote on **social media & Google Ads** targeting Kathmandu drivers.

2 Revenue Streams 💰

- **Subscription Model:** Monthly fee for parking lot owners.

- **Commission-Based Model:** Percentage per online booking.
- **In-app Ads:** Paid promotions from nearby businesses.

3. Scale to New Locations

- Expand to **Lalitpur, Bhaktapur, and major commercial hubs.**
- Add **features like valet service, EV charging spot locator, and parking reviews.**

🎯 **Outcome:** A fully operational smart parking system, generating revenue! 

Next Steps

- ✓ **Finalize your business model**
- ✓ **Decide on the IoT tech stack (ESP32, Raspberry Pi, etc.)**
- ✓ **Start designing the app** (Consider a UI/UX prototype)
- ✓ **Look for potential pilot locations**

Would you like help with **app design, IoT architecture, or business pitching?** 😊