SMART PARKING SYSTEM

Car Parking Reservation App

CCSW 313 Software Project Management

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Section: SE3

PROJECT BACKGROUND

The Smart Parking System aims to solve parking issues in crowded urban areas by helping drivers find available spots faster.

It offers an excellent solution through real-time maps, mobile booking, and efficient space management to reduce traffic and improve user convenience

WHY THIS PROJECT?

- Reduces time, stress, and trafic caused by parking issues
- Enhances revenue for parking operators
- Promotes eco-friendly practices by cutting unnecessary driving
- Aligns with smart city and digital infrastructure trends

KEY DRIVERS:

- People need easier ways to find parking
- Help save fuel and reduce traffic
- Fits with smart government city plans
- Can help parking business earn more

PROBLEM STATEMENT

Parking Challenges

- **Increasing Difficulty**: Finding parking in urban areas is a growing challenge for drivers.
- **Negative Impacts**:

1. Leads to frustration, congestion, and wasted time.
2. Drivers often spend excessive time circling parking lots searching for a spot.
3. Contributes to traffic bottlenecks and unnecessary fuel consumption.

- **Lost Opportunity**: Inefficient space management limits potential revenue for parking lot operators.

THE SMART SOLUTION

Smart Parking System

- **Innovative Solution:** Enables drivers to book parking spaces in advance, guaranteeing a spot upon arrival.
- **Enhanced User Experience**: Integrating real-time maps helps drivers quickly locate the nearest available parking spots, reducing search time and improving the overall experience.
- **Benefits for Operators**: Optimizes space usage, increasing revenue for parking lot operators and providing a competitive edge in the parking management industry.

EXPECTED BENEFITS

- **Intangible Benefits:**

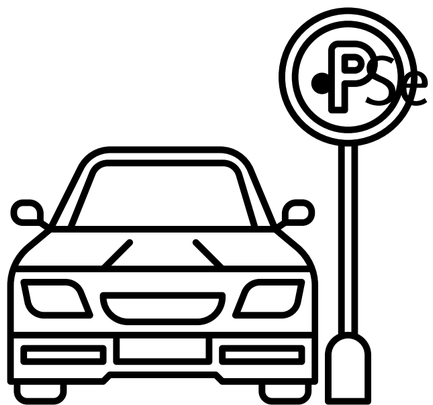
1. Improved User Experience (reduced stress, frustration)
2. Reduced Traffic Congestion
3. Competitive Edge for Operators
4. Enhanced Efficiency of Parking Process

- **Tangible Benefits:**

1. Increased Revenue for Parking Operators
2. Reduced Costs for Drivers
3. Potential for Revenue Generation through Premium Features

RISKS &MITIGATION STRATEGIES

Risk	Mitigation Strategy
• Low User Adoption	Marketing, incentives, partnerships
• Integration Difficulties	Technical analysis, time allocation, testing
• Data Inaccuracy	Reliable tech, validation
• Technology Dependence	Backup systems, reliable providers
• Budget/Schedule Overruns	Agile management, tracking, contingency plans
• Security/Privacy Issues	Strong security, encryption, authentication, compliance



RETURN ON INVESTMENT

This project offers a strong Return on Investment by addressing key problems in urban parking.

- **Financial Benefits:"**

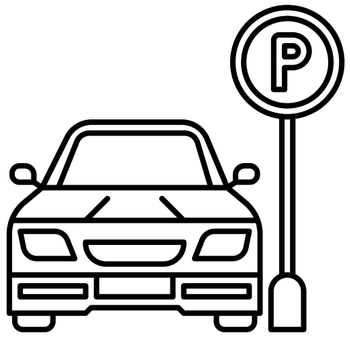
Project yearly income: SAR 400,000

Break-even point: Within one year

- **Value Proposition:**

For Drivers: Saves time and reduces stress

"For Operators: Optimizes space and increases revenue



FINANCIAL ANALYSIS

Discounted benefits - costs	(250,000)	291,200	265,600	240,000	217,600	764,400	← NPV
Cumulative benefits - costs	(250,000)	41,200	306,800	546,800	764,400		
ROI →	152%						

Payback in Year 1

- NPV 764.400
- ROI = 152%
- Payback in Year 1 = 41.200

PROJECT CHARTER

Project Objectives:

- The primary objective is to design and implement a Smart Car Parking System.
- The system will allow users to book parking spaces in advance, ensuring a guaranteed spot upon arrival.
- It will also incorporate real-time mapping to help users find the nearest available parking spaces quickly.

Stakeholders and thier roles

Some of our Key stakeholders :

Dr.Wed Aboznada(Course Instructor) : Main Investor / Academic Advisor

Mona Mohamed (Project Manager): Oversees Project Execution

Reem Al-Dabbagh(Interface & Accessibility Expert) : UX/UI Designer

Layla Ibrahim(Software Engineer): Lead Developer

Yousef Al-Bakri(IoT Systems Expert) : Smart Sensor Integration

Khalid Noor(Financial Investor): Private Funder

PROJECT CHARTER

High-Level Requirements:

- The system must include parking reservation functionality.
- It should integrate a user-friendly interface.
- The system needs to support payment integration.
- Real-time availability updates and map integration are crucial.

PROJECT SCOPE STATEMENT

In-Scope:

- **Parking Reservation:** The app should allow users to reserve parking spaces in advance to reduce the time spent searching for a spot.

- **Map Integration:** The app must display nearby available parking spaces using live map technologies, such as Google Maps.

- **User-Friendly Interface:** The app should have a simple and easy-to-use interface for booking parking spaces.

- **Payment Integration:** The app should support integrated payment options like credit cards or mobile payment methods.

PROJECT SCOPE STATEMENT

Out-of-Scope:

- **Parking Enforcement**: The project does not include parking enforcement or the management of violations.

- **Maintenance of Parking Infrastructure:** The maintenance of parking spaces or infrastructure is not part of this project

PROJECT SCOPE STATEMENT

Deliverables:

- **Survey Results:** Feedback gathered from potential users to identify their preferences, habits, and desired features for shaping the app's functionality.

- **Design Documents:** Wireframes and UI/UX flowcharts that define the visual and interactive elements of the app.

- **Software Code for the App:** The software code implementing all app features, including parking reservation, map integration, payment processing, and user authentication.

- **User Acceptance Testing (UAT) Results:** Real users test the app to ensure it meets expectations and is user-friendly, with feedback for improvements.

PROJECT SCOPE STATEMENT

Assumptions & Constraints:

- **Assumption**: All users have access to smartphones and the internet.

- **Constraint:** The budget is limited to $250,000, and the project timeline is 6 months.

Work Breakdown Structure -WBS- for Smart Parking System

- 1.0 Initiating
  - 1.1 Identify Stakeholders
  - 1.2 Prepare Project Charter
  - 1.3 Kick-off Meeting
- 2.0 Planning
  - 2.1 Define Project Scope
  - 2.2 Create Work Breakdown Structure (WBS)
  - 2.3 Prepare Schedule and Cost Estimation
  - 2.4 Identify Risks
- 3.0 Design and Development
  - 3.1 Design User Interface (UI)
  - 3.2 Develop Core System
    - 3.2.1 Parking Spot Booking
    - 3.2.2 Payment Integration
  - 3.3 Test Core Features (Functionality Testing)
  - 3.4 Conduct User Acceptance Testing (UAT)
- 4.0 Deployment
  - 4.1 Deploy the Application
  - 4.2 Set Up Servers
  - 4.3 Post-Launch Support
- 5.0 Closing
  - 5.1 Final Review and Documentation
  - 5.2 Lessons Learned

COST ESTIMATION
ESTIMATED BUDGET BREAKDOWN

WBS Items	Units/Hrs.	Cost/Unit Hour	Subtotal	WBS Level 1 Totals	% of Total
1.Labor				SAR 57,820	48%
1.1Project Manager	368h	SAR/hr 100	SAR 36,800		
1.2Developers	212h	SAR/hr 75	SAR 15,900		
1.3 Testers	32h	SAR/hr 60	SAR 1,920		
1.4 Designers	40h	SAR/hr 80	SAR 3,200		
2.Tools/Software				22,000SAR	18.20%
2.1IDEs	100h	60	6,000 SAR		
2.2Licenses	4h	4,000	25,000 SAR		
3.Materials				16,000	13.20%
3.1Server	2h	8,000	16,000		
4.Contingency				25,000SAR	20.60%
4.1Risk buffer	1h	25,000SAR	25,000SAR		
Cost estimation method		parametric			

CONCLUSION

1. Lessons Learned & Experience Gained:

- The importance of clear planning and goal setting.
- How to adapt to technical challenges and shifting requirements.
- Improved teamwork and time management skills.

2. Product Constraints (Design, Technical, Operational):

- Difficulty integrating sensors with existing infrastructure.
- Challenges ensuring real-time communication between app and backend.
- Need to consider maintenance and future scalability in the design.

3. Teamwork:

- The team benefited from diverse skills and backgrounds.
- Effective communication led to quicker problem-solving.
- Collaboration played a major role in maintaining project momentum.

CONCLUSION

4. Leadership:

- Clear decision-making helped maintain focus during key phases.
- Conflict resolution was handled respectfully and constructively.
- Tasks were delegated based on expertise, boosting efficiency.

5. Project Challenges:

- Tight deadlines required strict time management.
- Limited resources demanded careful allocation and prioritization.
- Scope creep was controlled through regular reviews and adjustments.

6. Future Endeavors:

- This project provided hands-on experience in project execution.
- Gained confidence in handling real-world technical and managerial challenges.
- Prepared the team for more advanced and larger-scale future projects.

Thank you for listening

ANY QUESTIONS ?