**Smart Parking**

**Smart Parking??!**

A smart vehicle parking is a system that helps drivers to find a vacant spot using sensors in each parking space by detecting the presence or absence of a vehicle.

Automated Parking systems are generally powered by electric motors (that move vehicles into a storage position).

**Project Charter**

**Official project name**: Smart Parking System

**Project sponsor**: Ministry of Transportation.

**Project manager**: Noor Elden Mahmoud Mohammed.

**Project members:** Eyad Mahmoud Ali, Heba Mostafa Ahmed, Waad Ahmed Shaaban, Naira Mohammed Hassan.

**Purpose of the project**: Enhance the security. parks as many vehicles as possible with the least space possible. Solves the vandalism and pollution problems.

**Business case** with increase in the population, number of vehicles increases and due to unmanaged parking, it leads to many problems as increasing number of vehicles creates congestion, wastage of space, wastage of time, pollution, traffic problems and many other difficulties. The aim of this project is to create a prototype of a parking, Mobile application and a website known as Smart Parking System. This system will be used by any parking area. The system will help control the parking slot availability and also allow drivers to book for a parking slot before reaching the parking area. The reservation will be for a certain period of time of which if the driver does not reach the parking area, their reservation will be expired. The android application will help people book and see available parking slots. While the website, which can be accessed anywhere around will be used to see the available slot and also renew the reservation when they are expired.

**Project scope**

The App will allow drivers to book for a parking slot before reaching the parking area.

The system will help control the parking slot availability.

The website that allows users to book for a parking.

The App and Website allow users to be aware their parking status.

**Key deliverables**

Smart Parking mobile application that will work on both android and IOS.

Smart Parking Website. (QR-Code Card (used on parking area))

**Project milestones**

Requirements Review: Requirements specifications are complete, correct, approved and suitable. By 10/10/2021

Critical design review: Detailed designs fully implement the system architecture, are approved and are suitable for input into the development of code. By 15/11/2021

System test Review: The software product has passed system testing and is suitable for input into acceptance testing.by 15/11/2022

Product operational: The software is in use in its target operational environment.by 15/12/2022

**Project resources**

Staff: 2 android developers ,2 IOS developers, 1 full Stack Web-Developer

Hardware: 5 laptops, 2 servers

* Software: Software licenses (Editors: Android-Studio, App Code, PHP Storm)

**Budget:** budget allocated for **Software part**: 250000 L.E

**Constraints**

* This project must be delivered within the specified budget
* This project must be delivered on 1/1/2022
* laptops or computers needed must be bought from (Apple & Microsoft companies)

**Assumptions (required event must be occur every fixed period)**

* will get all resources required.
* All-important stakeholders will come to the specified meetings.
* All team members continue to the end of the project

**Risk Assessment**

Inaccurate estimates

Project team misunderstand requirements

High System maintenance costs

Loss of key personnel

Customer will not accept the software as delivered even though it meets all specifications

Selected technology is a poor match to the problem or customer

Server Crashes

**Risks can be managed by effective plans like:**

Hire efficiencies

Make plan to reduce costs

Securing the servers

Support the system and the apps

**Work Breakdown Structure {WBS}**

1.Database

2.Network

2.1. Router

2.2. LAN

2.3. WAN

3.Test the application.

3.1 analysis the project.

3.2 develop the Project.

3.2 test the validity of the project

**WBS DICTIONARY**

|  |  |
| --- | --- |
| **Work Package ID**  **Work Package Name**  **Description**  **Person**  **Start Date**  **End Date** | **3.1.1  Hardware documentation Software specification/ design Manager & Team Members  1 October 2021  4 October 2021** |
| ***Work Package ID***  ***Work Package Name***  ***Description***  ***Person***  ***Start Date***  ***End Date*** | **3.1.2**  **Hardware documentation**  **Software configuration**  **Manager & Team Members**  **5 October 2018**  **11 October 2018** |
| ***Work Package ID***  ***Work Package Name***  ***Description***  ***Person***  ***Start Date***  ***End Date*** | **3.1.2**  **Hardware documentation**  **Software configuration**  **Manager & Team Members**  **5 October 2018**  **11 October 2018** |

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**Activity-on-node Network**

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| --- | --- | --- |
| **22** | **E** | **30** |
| **2** | **Software configuration** | |
| **24** | **8** | **32** |

|  |  |  |
| --- | --- | --- |
| **0** | **A** | **10** |
| **5** | **Hardware specification** | |
| **5** | **10** | **15** |

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| --- | --- | --- |
| **37** | **G** | **45** |
| **0** | **User Acceptance Testing** | |
| **37** | **8** | **45** |

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| --- | --- | --- |
| **15** | **C** | **22** |
| **0** | **Hardware testing & results** | |
| **15** | **7** | **22** |

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| **32** | **F** | **37** |
| **0** | **Software test scripts** | |
| **32** | **5** | **37** |

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| **45** | **H** | **55** |
| **0** | **Marketing** | |
| **45** | **10** | **55** |

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| **0** | **B** | **15** | | **15** | |
| **0** | **Hardware availability** | | |  |
| **0** | **15** |  | **15** | |

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| --- | --- | --- |
| **22** | **D** | **32** |
| **0** | **Software specification/ design** | |
| **22** | **10** | **32** |

**Resource constraints**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ID** | **RES** | **DUR** | **ES** | **LF** | **SL** | **0** | | **1** | | **2** | | **3** | | **4** | | **5** | | **6** | | **7** | | **8** | | **9** | | **10** | | **11** | | **12** | | **13** | | **14** | | **15** | | **16** | |
| **Hardware specification** | **2** | **2** | **0** | **15** | **5** | **2** | | **2** | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |
| **Hardware availability** | **3** | **2** | **0** | **15** | **0** | **3** | | **3** | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |
| **Hardware testing & results** | **4** | **3** | **15** | **22** | **0** |  | |  | | **4** | | **4** | | **4** | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |
| **Software specification / design** | **2** | **4** | **22** | **32** | **0** |  | |  | |  | |  | |  | | **2** | | **2** | | **2** | | **2** | |  | |  | |  | |  | |  | |  | |  | |  | |
| **Software configuration** | **2** | **3** | **22** | **32** | **2** |  | |  | |  | |  | |  | | **2** | | **2** | | **2** | | **2** | |  | |  | |  | |  | |  | |  | |  | |  | |
| **Software test scripts** | **3** | **3** | **32** | **37** | **0** |  | |  | |  | |  | |  | |  | |  | |  | |  | | **3** | | **3** | | **3** | |  | |  | |  | |  | |  | |
| **User Acceptance Testing** | **3** | **2** | **37** | **45** | **0** |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | **3** | | **3** | |  | |  | |  | |
| **Marketing** | **5** | **3** | **45** | **55** | **0** |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | **5** | | **5** | | **5** | |
| **Total Resource Load** | | | | | | | **5** | | **5** | | **4** | | **4** | | **4** | | **4** | | **4** | | **4** | | **4** | | **3** | | **3** | | **3** | | **3** | | **3** | | **5** | | **5** | | **5** | |
| **Resource Available** | | | | | | | **5** | | **5** | | **5** | | **5** | | **5** | | **5** | | **5** | | **5** | | **5** | | **5** | | **5** | | **5** | | **5** | | **5** | | **5** | | **5** | | **5** | |

**Roles and Responsibilities Matrix**

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| --- | --- | --- | --- | --- | --- |
|  | **Project manager**  **(NOOR)** | **Application developer**  **(EYAD)** | **Network engineer**  **(HEBA)** | **Project designer**  **(WAAD)** | **Project sponsor**  **(NAIRA)** |
| **Hardware specification** | **A** |  | **C** |  |  |
| **Hardware availability** | **R** | **A** | **P** |  |  |
| **Hardware testing & results** | **A** | **R** |  | **P** | **P** |
| **Software specification / design** |  |  | **C** | **A** |  |
| **Software configuration** |  |  |  | **C** | **R** |
| **Software test scripts** | **R** | **C** | **P** |  |  |
| **User Acceptance Testing** | **P** | **A** |  |  | **A** |
| **Marketing the project** | **R** | **A** | **P** | **P** | **C** |

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| **ID** | **DUR** | **Task** | **Budget** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| A | **2** | **Hardware specification** | 100 | 20 | 20 | 20 | 20 | 20 |  |  |  |  |  |  |  |
| B | **3** | **Hardware availability** | 14 |  |  |  |  |  | 7 | 7 |  |  |  |  |  |
| C | **4** | **Hardware testing & results** | 30 |  |  |  |  |  | 10 | 10 | 10 |  |  |  |  |
| D | **2** | **Software specification / design** | 30 |  |  |  |  |  | 15 | 15 |  |  |  |  |  |
| E | **2** | **Software configuration** | 5 |  |  |  |  |  | 5 |  |  |  |  |  |  |
| F | **3** | **Software test scripts** | 25 |  |  |  |  |  | 25 |  |  |  |  |  |  |
| G | **3** | **User Acceptance Testing** | 20 |  |  |  |  |  |  |  |  | 10 | 10 |  |  |
| H | **5** | **Marketing the project** | 10 |  |  |  |  |  |  |  |  |  |  | 5 | 5 |
| **Total** | | | 52 | 20 | 20 | 20 | 20 | 20 | 62 | 32 | 10 | 10 | 10 | 5 | 5 |
| **Commutative** | | | | 20 | 40 | 60 | 80 | 100 | 162 | 194 | 204 | 214 | 224 | 229 | 234 |

**Budget Baseline:**