**System Requirements**

**<Project Code>: P04**

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* **Introduction**

Our project “Manzil” will be in the form of a mobile app and has two main aspects. The first one is assisting people travelling to northern destinations in several ways, helping them streamline the process. This includes letting users access hotel information/bookings, rental vehicles, travelling companies’ itinerary access etc.

The second aspect will in the form of a guide to major cities (as a starting point) such as Lahore, Karachi and Islamabad. Users will be provided information and reviews on services such as restaurants, schools, hospitals etc. in these cities, which they might search through with integrated map location radius feature. This mobile application might use ML in a variety of ways to further enhance user experience such as search features, recommendations and chatbots.

* **System Actors**

<List down the actor names and give a 2-3 lines description of the role of each actor>

|  |  |
| --- | --- |
| **Actor Name** | **Description** |
| Customer | Customers are the primary users of the app. They can create accounts, log in, search for tourist locations, view details of hospitals, hotels, car rental services, and tourist attractions, book services, and leave reviews for services they’ve used |
| Hotel Management/Administration | Hotel administrators handle hotel-related operations. They can create accounts for their hotels, connect with customers, update room availability, upload hotel details and pictures, and view customer reviews, ensuring smooth customer interaction and bookings. |
| App Administration/Developers | The app administration is responsible for maintaining and managing the backend and overall functionality of the app and resolving any issues related to it. |

* **Functional Requirements**

<Write system requirements from users’ (actors) perspective. Actors' names have been highlighted in the sample requirements below. You may group requirements according to actors or modules>

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| --- | --- |
| **Requirements** | |
| **Sr#** | **Requirement** |
| 1 | As a customer, I want the system to let me create an account with my email. |
| 2 | As a customer, I want to log in to my account. |
| 3 | As a customer, I want the system to send me verification code, upon signup. |
| 4 | As a customer, I want the system to let me search for locations, and tourist sites. |
| 6 | As a customer, I want the system to show me detailed overview of the hospitals, hotels, rent a car centers, restaurants and tourist points. |
| 7 | As a customer, I want the system to let me reserve hotel rooms or book doctor’s appointments. |
| 8 | As a customer, I want the system to let me connect with rent-a-car centers. |
| 9 | As a customer, I want the system to show me live weather and help me navigate to my destination. |
| 10 | As a customer, I want the system to let me give reviews on hotels, hospitals, and rent-a-car centers. |
| 11 | As a hotel managing staff, I want the system to let me create an account for my hotel. |
| 12 | As a hotel managing staff, I want the system to let me connect with customers. |
| 13 | As a hotel managing staff, I want the system to let me update my hotel records and status. |
| 14 | As a hotel managing staff, I want the system to let me upload pictures and details of my hotel. |
| 15 | As a hotel managing staff, I want the system to show me the customer reviews for my hotel. |
| 16 | As an App Administrator, I want the system to let me update the backend code, with data remaining intact. |
| 17 | As an App Administrator, I want the system to let me block or delete user accounts (customer, hotel management, hospital management and car vendors) in critical situations. |
| 18 | As an App Administrator, I want the system to use ML models to enhance its performance in multiple aspects. |

* **Non-functional Requirements / Quality Attributes**

<Requirements must be testable>

<Security requirements fall in the category of “Non-functional requirements”; however, you need to list them separately in the section **Security Requirements** later in this document.>

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| **Sr#** | **Requirements** |
| 1 | The app should not use more than 500 MB of memory when multiple features like maps, weather updates, and hotel reservations are being used simultaneously. |
| 2 | The app should load the main dashboard within 3 seconds on a standard 4G network |
| 3 | The app should be able to support up to 200 users booking hotels or navigating to destinations simultaneously without slowing or crashing |
| 4 | The app should be compatible with mobile devices running Android version 8.0 or higher and IOS version 12.0 or higher |
| 5 | The app should ensure that all screens maintain a consistent response time under 2 seconds with interacting with API calls |
| 6 | The app must be available 99.9% of the time over a period of 30 days, excluding planned maintenance |
| 7 | The system should recover and resume normal operations in less than 5 minutes in case of a failure |
| 8 | The app should display search results for tourist locations and services (e.g., hotels, restaurants) within 2 seconds after the user initiates a search. |
| 9 | The app should sync live weather and traffic updates within 2 minutes of change for any destination. |
| 10 | The app should provide feedback or error handling within 1 second of an invalid search query or failed booking attempt. |
| 11 | The app’s user interface should remain responsive (i.e., no lag) even when navigating between different modules like hotel booking, car rentals, and live weather updates. |

* **Security Requirements**

|  |  |  |  |
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| **Sr#** | **Security Risks** | **Potential Losses** | **Controls** |
| 1 | A01:2021 - Broken Access Control | Unauthorized users gaining access to sensitive information  Loss of customer trust  Legal consequences due to privacy violations | Implement role-based access control (RBAC) to ensure that only authorized users can perform specific actions.  Ensure access controls are enforced consistently across all applications and API endpoints  Implement input validation and output encoding to prevent unauthorized data exposure  Enable audit logging to track access control violations |
| 2 | A02:2021 - Cryptographic Failures | Compromise of sensitive data (e.g., customer details, booking information)  Financial loss due to data theft attacks  Non-compliance with data protection regulations such as GDPR | Using strong, industry-standard encryption algorithms (e.g., AES-256) for data at rest and in transit  Implement secure key management practices, ensuring cryptographic keys are stored securely and rotated periodically  Use secure TLS/SSL protocols for all communications between the client and server  Avoid exposing sensitive data unnecessarily, especially in logs or error messages |
| 3 | A07:2021 - Identification and Authentication Failures | Identity theft and fraud  Potential legal repercussions | Implement multi-factor authentication (MFA) for users and administrators  Use secure password storage techniques; bcrypt or Argon2 to hash passwords.  Implement account lockout mechanisms to mitigate brute force attacks  Ensure secure session management such as secure cookies, expiring sessions after inactivity, and avoiding session identifiers in URLs |

* **Who Did What?**

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| --- | --- |
| **Name of the Team Member** | **Tasks done** |
| Shahrez Faisal | Non-Functional Requirements |
| Usman Arshid | Security requirements |
| Muhammad Mehdi | Functional Requirements |
| Omar Ibne Sajjad | System Actors |
| Umer inayat | Introduction |

* **Review checklist**

Before submission of this deliverable, the team must perform an internal review. Each team member will review one or more sections of the deliverable.

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| --- | --- |
| **Section** **Title** | **Reviewer Name(s)** |
| Introduction | M. Usman Arshid |
| Actors | Muhammad Mehdi |
| Functional Requirements | Shahrez Faisal |
| Non-functional requirements | Umer Inayat |
| Security Requirements | Omar Ibne Sajjad |