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# **SOFTWARE REQUIREMENTS SPECIFICATION**

**for**

**Sarthi**

**Version 2.0**

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# Revision History

Version	Date	Description of Changes	Sections Updated
1.0	11 Sep 2025	Initial release of Software Requirements Specification	All
2.0	14 Nov 2025	<ul style="list-style-type: none"><li>Buy &amp; Sell renamed to <b>Market Place</b> and communication changed to email instead of in-app messaging.</li><li>Lost &amp; Found module redesigned to redirect users to external WhatsApp groups instead of application-based listings.</li><li>New user roles added — Faculty and IIITG Staff (neither student nor faculty) introduced as secondary users.</li><li>Role-based access updated throughout document with different profile types and access levels.</li><li>Navigation Flow modified — landing page now requires role selection (student / staff / faculty) before login.</li><li>Technology Stack enhanced — <b>Socket.IO added for ride-sharing chat.</b></li><li>System architecture direction updated with emphasis on microservices and scalability.</li><li>Software Quality Attributes refined to highlight maintainability and scalability<sup>3</sup></li></ul>	1.1, 1.1.1, 2.1, 2.2, 2.3, 2.5.2, 2.5.3, 3.1, 3.2, 4.3

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# 1 Introduction

## 1.1 Purpose

Students at the Indian Institute of Information Technology Guwahati (IIITG) currently lack a centralized and efficient platform to manage common peer-to-peer utility services. Essential activities, such as organizing taxi pools, buying or selling hostel items, and even seeking academic or logistical help, are mostly handled through temporary, unorganized channels such as WhatsApp or Telegram groups. These methods are fragmented, difficult to search, and often result in missed opportunities, communication delays, and unnecessary overhead.

The purpose of the **Sarthi Web Application** is to address these challenges by providing a dedicated, persistent, and structured digital platform tailored to the needs of the IIITG student community. The application aims to streamline essential user interactions by enabling:

- Peer-to-peer buying and selling of essential items.
- Coordinated ride-sharing to reduce travel costs and improve convenience.
- Have a feature that connects users to an existing social media community (WhatsApp) for reporting and finding lost items.
- Future integration of community forums, rental listings, and vendor tie-ups in the Market Place.

Through these features, **Sarthi** enhances campus resourcefulness, encourages collaboration, and simplifies student life—especially for hostel residents and students travelling from distant regions.

### 1.1.1 Project Scope

The scope of the **Sarthi Web Application** encompasses the design, development, and maintenance of a web-based platform tailored specifically for the IIITG student community. The platform will serve as a one-stop solution for common logistical and social needs of students and other users, addressing the inefficiencies of current informal communication channels.

#### Phase 1: Web Application (Current Development)

##### 1. Market Place Module

- Post and browse listings to buy or sell everyday essentials (e.g., mattresses, buckets, utilities).
- Enable messaging or contact functionality for negotiations(by making institute email id available).

## **2. Ride-Sharing Module**

- Allow users to post upcoming travel plans (with date, time, and destination).
- Discover ride-sharing opportunities and coordinate to split costs.
- Integrated chat system for planning and coordination.

## **3. Lost & Found Module**

- A feature connects users to an existing social media community (WhatsApp) for reporting and finding lost items.

## **Phase 2: Future Enhancements (Mobile + Web Expansion)**

### **1. Community Forum**

- A platform for announcements, feedback, queries, or general discussions.

### **2. Vendor Tie-ups (with Market Place)**

- Collaborations with local shops to facilitate direct delivery of goods to campus.

### **3. Rental and PG Listings**

- Search or post about available rooms, PGs, or flats near the campus for students preferring off-campus living.

## 2 Overall Description

### 2.1 Product Perspective

The **Sarthi Web Application** is conceived as a new, centralized platform that replaces the current fragmented and temporary communication methods used within the IIITG student community. At present, most interactions for ride-sharing, peer-to-peer sales, or logistical coordination are conducted through informal WhatsApp or Telegram groups. These existing solutions are ad hoc, difficult to search, and lack structured features tailored to the requirements of students, faculties and staffs.

Sarthi provides a structured, searchable, and persistent digital environment for these activities. It is designed as a full-stack web application in its first phase, accessible through modern browsers on desktops, laptops, and mobile devices. From a system context perspective:

- **Users:** Primary users will be IIITG students, with access for faculty and IIITG staff(neither student nor faculty), referred to as staff in this Web App.
- **Interfaces:** The system will provide a browser-based interface. Later, it will support mobile platforms (Android/iOS) as part of Phase 2 development.
- **Dependencies:** The system requires a stable internet connection and authentication linked to the IIITG email domain for account creation and verification.
- **System Interaction:** Initially, the application will not integrate with external systems. Future enhancements may include APIs for payment gateways, vendor management, or external delivery services.

Thus, Sarthi will evolve from being a campus-focused, self-contained web application into a more comprehensive ecosystem that supports both web and mobile users, marketplace vendor partnerships, and extended community interactions.

### 2.2 User Classes and Characteristics

The **Sarthi Web Application** is intended for the IIITG community. The following user classes have been identified:

#### 1. Students -Primary Users

- Description: Undergraduate, postgraduate, and doctoral students at IIITG form the primary user base.

- Responsibilities:
  - Create and browse buy/sell listings on the marketplace.
  - Post and join ride-sharing opportunities.
  - Participate in lost and found listings.
  - In future versions, participate in community forums and rental listings.
- Characteristics: Digitally literate, familiar with using web-based platforms, and accustomed to informal communication tools such as WhatsApp/Telegram.
- Access: Browser-based login using IIITG credentials.

## **2. Staff (IIITG staffs, neither students nor faculty)- Secondary Users**

- Description: Members of the IIITG staff responsible for administrative duties of IIITG
- Responsibilities:
  - Create and browse buy/sell listings on the marketplace.
  - Post and join ride-sharing opportunities.
  - Participate in lost and found listings.
  - In future versions, participate in community forums and rental listings.
- Characteristics: Technically proficient, with knowledge of college administration, web applications and accustomed to informal communication tools such as WhatsApp/Telegram.
- Access: Browser-based login using IIITG credentials.

## **3. Faculty -Secondary Users**

- Description: Includes the Faculties at IIITG.
- Responsibilities:
  - Create and browse buy/sell listings on the marketplace.
  - Post and join ride-sharing opportunities.
  - Participate in lost and found listings.
  - In future versions, participate in community forums and rental listings.
- Characteristics: Technically proficient, with knowledge of web applications and accustomed to informal communication tools such as WhatsApp/Telegram.
- Access: Browser-based login using IIITG credentials.

## **4. Vendors (Future Scope)**

- Description: Local shops and service providers engaged with the IIITG community for commercial tie-ups.

- Responsibilities:
  - Post and update product or service listings for students.
  - Handle direct orders or inquiries from students.
- Characteristics: Varying technical literacy; therefore, their interface must be simple and intuitive.
- Access: Restricted accounts for business use only, enabled in future phases.

## 2.3 Product Functions

The **Sarthi Web Application** will provide the following high-level functions, organized by major modules:

### 1. Market Place Module

- Allow users to create, update, and delete buy/sell listings for commonly used items such as mattresses, buckets, and other essentials.
- Enable browsing of existing listings.
- Leverage direct email communication through local email client existing in user system.

### 2. Ride-Sharing Module

- Allow users to post travel details, including date, time, destination, and available seats and accept ride-sharing requests as per their choice.
- Enable discovery of existing ride-sharing opportunities through browsing.
- Support basic communication (chat among users who accept ride requests) for coordination between ride-sharers.

### 3. Lost & Found Module:

- Will contain the feature that connects users to an existing social media community (WhatsApp) for reporting and finding lost items.

### 4. Planned Future Enhancements (Phase 2)

- **Community Forum:** Facilitate discussions, announcements, and query resolution.
- **Vendor Tie-ups:** Enable local vendors to post product or service listings and handle student orders.
- **Rental Listings:** Allow users to search and post rental or PG accommodations near campus.

Overall, these functions will streamline essential user interactions, reduce dependence on informal communication platforms, and ensure secure and organized information exchange within the IIITG community.

## 2.4 Operating Environment

The website will operate in any modern operating environment, including macOS, Windows, and Linux.

## 2.5 Design

### 2.5.1 System Design Overview

The **Sarthi Web Application** is designed as a browser-based platform accessible only to IIITG students through institute's email authentication. The system enforces secure login using the student's official institute email. After successful login, users are directed to the Home Page, which acts as the central hub for all modules of the application. The application is modular in nature, with each functional component accessible through the Home Page. The design follows a role-based structure, ensuring different privileges for staffs, faculties in future versions, marketplace vendors.

### 2.5.2 User Interface Design

The user interface (UI) will be simple, minimalistic, and mobile-responsive to ensure usability on laptops, desktops, and smartphones. The navigation structure will be consistent across all modules.

#### 1. Login Page

- Users must log in with their IIITG institute email.
- Ensures that only verified users can access the platform.

#### 2. Home Page

- Acts as the central hub of the application.
- Provides navigation to the following components:
  - a) Profile
  - b) Market Place
  - c) Ride Sharing
  - d) Lost and Found
- Additional modules will appear in future releases:
  - a) Market Place with Vendor integration
  - b) Rent/PG Listings

#### 3. Profile Page

- Allows users to customize their personal information according to their role (name, contact number, and other necessary details, based on their roles).

### **2.5.3 Navigation Flow**

The navigation flow of the system is as follows:

1. On opening the Web App, the users find a landing page,, where users can enter into the Web-App, after choosing their respective roles(student, staff and faculty).
2. User accesses the application and is presented with the Login Page.
3. On successful authentication, the user is redirected to the Home Page.
4. From the Home Page, the user can select modules such as:
  - **Profile:** Manage personal details (different profiles for faculty, student and staff).
  - **Market Place:** Browse items posted by other users and create or manage item listings.
  - **Ride Sharing:** Post or join ride-sharing opportunities.
  - **Lost and Found:** Feature to connect users to existing social media communities(WhatsApp) to find and report lost items
5. Future modules (Marketplace with vendor, Rent/PG) will integrate into the same navigation structure.

### **2.5.4 Design Constraints**

- Only IIITG email IDs are allowed for login (restricting usage to the IIITG community).
- Internet connectivity is required at all times to access features.
- Initial version is web-only; mobile app support will be provided in later phases.
- Security constraints include email-based authentication.
- The system architecture shall follow a microservices-based design to support modularity, independent service scaling, and ease of maintenance.

# 3 System Features

**Sarthi** is a peer-to-peer utility web application for IIITG students. The main purpose of this product is to streamline student interactions such as Market Place, Ride-Sharing, Lost & Found, and eventually extend to Market Place with Vendor, and PG/rental listings.

## 3.1 Description and Priority

Sarthi has both core features (Phase 1) and extended features (Phase 2). All Phase 1 features are mandatory, while Phase 2 features are planned for future releases, ensuring scalability of this application.

### The features with priority (top to bottom):

1. **Login and Authentication:** Only IIITG students, staffs and faculties can log in using their institute email ID. This ensures restricted and secure access. (**High Priority**)
2. **Marketplace (Buy & Sell):** users can buy or sell essential items (mattresses, buckets, books, etc.). Includes item posting, browsing, and contact options(making institute email ids of the user available)(**High Priority**)
3. **Ride-Sharing:** users can post travel plans (date, time, destination) and coordinate shared rides to split costs. (**High Priority**)
4. **Lost and Found:** Connecting users to an existing social media community(WhatsApp) for reporting and finding lost items. (**High Priority**)
5. **Profile Management:** Students, staffs and Faculties can customise their profile, edit personal information, according to their roles. (**Medium Priority**)
6. **Future Enhancements (Phase 2):** Community Forum, Vendor Marketplace for local shop tie-ups, and PG/Rental Listings. (**Low Priority – Future Scope**)

## 3.2 Functional Requirements

The **Sarthi Web Application** will be built using modern web technologies to ensure scalability and ease of use.

## **Technology Stack:**

- **Front-End:** React.js
- **Back-End:** Node.js, Express.js
- **Database:** MongoDB (NoSQL database for flexibility)
- **Authentication:** Google OAuth 2.0 restricted to IIITG domain emails
- **Chat Feature (in Ride-Sharing Module):** Socket.IO
- **Communication (Market-Place Module):** Local Email Client

## **Core Functionalities:**

1. User login restricted to IIITG email IDs.
2. Browse and create items in the Market Place.
3. Connect users through direct email client in Market-Place.
4. Create and browse ride-sharing posts.
5. Enable chat feature among users on accepting ride sharing requests.
6. Profile customization.

# **4 Other Nonfunctional Requirements**

## **4.1 Performance Requirements**

- The system shall support many concurrent users without performance degradation.
- Average response time for major actions (login, browse, post) shall be fast.

## **4.2 Security Requirements**

- Only users with valid IIITG email IDs shall be able to register and log in.

## **4.3 Software Quality Attributes**

- **Usability:** Simple, clean, and device and OS friendly interface for easy adoption by students.
- **Reliability:** The system shall have maximum up-time during academic semesters.
- **Maintainability and Scalability:** Modular code structure to allow integration of new features (Market Place with vendor, etc.).
- **Portability:** Accessible on all major browsers. Mobile application to be developed in Phase 2.

## **4.4 Business Rules**

- The application is strictly for IIITG students, faculty and staff and requires institute email authentication.
- Users are responsible for their own listings and negotiations; Sarthi acts only as a facilitator.

## 5 Other Requirements

- The system will require periodic maintenance, including database backups and security updates.
- Future requirements may evolve based on user feedback, such as adding new modules or vendor services.
- Scalability must be ensured so the same platform can later host both web and mobile applications.

## 6 Project Timeline

The following table represents the **estimated** time to complete the entire process.

Phase	Timeline
Software Requirement Specification (SRS)	1 Sep - 10 Sep
Design Document	11 Sep - 30 Sep
Development	1 Oct - 31 Oct
Testing and Deployment	1 Nov - 10 Nov