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Cos301 : Software Requirements Specification for the NavUP System

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2.2 Product Functions

Users will be able to use their handheld devices to navigate around the campus if they having trouble to find venues. The system will assist the user to avoid pedestrian traffic and find the quickest route to their desired venue. The system will be able to locate the users current location either inside or outside the building by the use of the Wi-Fi access points. The system will store different types of information such as social events and activities, venues using multiple types of devices and services.The different types of information will be store on database.

2.3 User Characteristics

NavUP should have three user groups: A student or staff member, a administrator, and a guest user.

Students and staff members

- Students and staff members are registered, and have student numbers.
- Students are likely to be young (Below the age of 30)
- Students and staff members are likely to have a high level of education.

- Students and staff members should have a relatively high level of technical experience, and therefore be able to use and navigate a relatively complex app.

Guest Users

- Guests are unregistered.
- The technical level and education of a guest is unknown. It might be difficult for them to navigate a complicated interface.

Administrators

- Administrators should have a high level of technical expertise.
- Administrators likely have some form of identification, such as a student number.

2.4 Constraints

- **Cost** - We do not have the funds to pay for expensive libraries and tools.
- **Time** - Most of us are third year and honours students, and so we do not have much time to work on the project. Additionally, we only have one semester to do this.
- **Skills** - Our skills are varied, but mostly undeveloped, which limits the technical complexity of our solution.
- **Scope** - Our scope is defined as a navigation system for the University of Pretoria, and so our solution should be limited as such.

2.5 Assumptions and Dependencies

2.5.1 Assumptions

- The application is free for all users.
- Users will access the application through hand-held devices.
- The system will be available 24/7
- The system will be simple.
- The system can locate a user inside and outside the building.
- The system can detect pedestrian traffic around the campus.
- User friendly system.

- Users are technically competent.
- Access to Wi-Fi.
- Users operating system is either Android or IOS.
- Users will be willing to provide personal information.

2.5.2 Dependencies

- Teams time and abilities.
- Feedback from stakeholders.
- A database to store users history, location and social activities
- The application needs access to Wi-Fi.
- Adequate advertisement.

3 Specific Requirements

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3.1 External Interface Requirements

System Interfaces

User Interfaces

Hardware Interfaces

1. **An android phone or tablet**
   Android will be the most common device used, and will likely be the only device we develop a solution for. There are android devices with many varying specs, but we will focus on newer models in order to simplify the prototype.
   Tablets are not used often for navigation, but due to the nature of Android the app will work there as well.
2. **An iPhone or iPad**
   It is possible but unlikely that we develop an app for iOS, as only a small percentage of staff and students use iPhones or iPads.

Software Interfaces

Communications Interfaces

1. **Cellular networks**
   We will use cellular networks for downloading and uploading data and information required to use the app, such as user credentials, heat-maps, and routing.

2. **Global Positioning Satellites (GPS)**
   We might use GPS to locate the device for heat-map generation and navigation.

3. **Wireless networking (WiFi)**
   WiFi will be used where possible to download and upload data similar to cellular networks. WiFi will also be used to locate the device similar to GPS, especially inside where GPS connection may be poor.

4. **E-mail**
   We may use email for registration and login, as well as passing information on to the user.
   Input: The user's email address.
   Output: An email to the user containing information.

3.2 Functional Requirements

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3.3 Performance Requirements

The system must:

- Be interactive to user input within 2 seconds.
- Acquire the user's location with an accuracy within an 8m radius.
- Display the user's location on a map within 3 seconds after launching.
- Generate routes for users within 2 seconds.
- Update the user's location every second when navigating.
- Give a warning or indication if the processes take longer than anticipated.
- Display a message if an error is encountered.

3.4 Design Constraints

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3.5 Software System attributes

Reliability The system must be able to all its functions under the stated conditions and produce correct and consistent results.

Portability

- The system must be able to run on different operating environments or platforms i.e. the system must be able to run on iOS and android.
- The system must be able to run on different mobile devices such as smartphones and tablets.

Robustness The system must be able to perform its required functions under rough or exceptional conditions. Since the system heavily depend on newtwork connections, however the application must be able to perform basic navigation functions offline.

Security

- Only administrators must be able to add data to the system.
- The location of the user must not be broadcasted or used by another application.
- All data transmitted between subsystems must be encrypted.

Reusability The system must be reusable, it must permit itself to be used in a similar or different context with or without extension or customization.

Efficiency The system must be able to perform its functions and produce desired results with minimum expenditure of time and resources.

Availability The system must be always available provided that the minimum hardware requirements are met.

3.6 Other Requirements

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