Software Requirement Specification

(All Abroad)

(One stop guide to joining your dream graduate school)

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Revision History

Name	Date	Description of Version	Version
Archana Nagarajan	11/08/2016	Initial Version	1.0
Mugdha Mathkar			
Shruti Nafday			

1 Introduction

1.1 Purpose

The document contains the software requirement specification of ALL ABROAD, a mobile application which facilitates easy access to information about various universities from all around the world for students who want to pursue their masters abroad.

The goal of this application is to be a one stop guide for international students. The application will display the criteria required for various universities such as the accepted GRE, TOEFL scores. It will order the universities based on the rankings worldwide as well as countrywide. There will also be department specific rankings. This application will also provide profile evaluation among other things such as alerting the users when an application deadline is approaching. The initial version of the app will be free so the users will get a feel of how useful this app will be which will further make them enroll for the paid version of the application which will include a lot more features. For example, the app will be tailor-made for the registered users offering helps to individuals through dedicated tutors.

Although some applications do exist on similar lines, they are very course or country specific and none of them exist for mobile platforms. This encouraged our clients to come up with the idea to develop a mobile application which would be very generic and could be used by students from across the globe for courses of any domain.

The requirements stated in this document will determine the final product and its functionalities. This document will also be used to determine the success of the product.

The purpose of the software requirement specification document is to maintain all the functionalities and the specifications of the All Abroad Mobile Application. Besides, it contains a detailed description of all the requirements specified before.

1.2 Intended Audience

The intended audiences of stakeholders for this specification of the AAMA include:

- 1. Users:
 - Students applying to universities in Unites States and Europe for Masters program.
 - Users who want information about universities and the courses offered by them.
- 2. Clients, who must approve it.
- 3. Designers, who must design AAMA in such a way that it meets the requirements specified in this SRS.
- 4. Programmers, who will implement the requirements described in this SRS.
- 5. Testers, who validate the requirements specified in the SRS.

1.3 Product Scope

The scope of AAMA is

- 1. Any user should be able to browse through the list of universities, the departments present and the coursers offered without signing up for the application.
- 2. Potential users of the application should be able to:
 - Log-in/ sign up for the application.
 - Search for universities of their choice.
 - Search for universities applying various filters such as the location of the university, research area of interest, public/private universities etc.
 - Viewing the ranks of various universities in a country/location and also as per the area of study.
- 3. Real time updating of information.

- 4. Profile evaluation of students
 - Categorizing the universities as safe, moderate and ambitious depending on their overall profile.
- 5. Email reminder of the approaching deadlines.

1.4 Acronyms and Abbreviations

• AAMA: All Abroad Mobile Application

• DESC: Description

• RAT: Rationale

• DEP: Dependency

• UI: User Interface

- FAQs:Frequently Asked Questions
- User: Someone who interacts with the mobile application
- Admin/Administrator: System administrator who is given specific permission for managing and controlling the system
- Stakeholder: Any person who has interaction with the system who is not a developer
- MUST: The minimum level required to avoid failure of the application
- SCALE: The scale of measure used by the requirement
- WISH: A desirable level of achievement that may not be attainable through available means
- PLAN: The level at which good success can be claimed

1.5 Overview of Document

This specification is organized into the following sections:

- Introduction, which introduces the specification for the AAMA to its readers.
- The Overall Description, which provides a brief, high level description of the AAMA which includes the functionality, product perspective, users of the product, the assumptions and dependencies involved.
- External Interface Requirements, which describes the various interfaces of AAMA including hardware, software and UI.
- System Features, which specifies the functional requirements of the product along with their stimulus/response sequences.
- Non functional requirements specifies the criteria that can be used to evaluate the operation of a system .
- Project issues include the requirements that have been deferred to future releases and the issues that have not been resolved yet.

1.6 References

IEEE. IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specifications. IEEE Computer Society, 1998.

2 Overall Description

2.1 Product Perspective

The system consists of three main parts:

- Mobile Application: The mobile application will be used by the users to search for universities. The results can be filtered by the user inputs. There are several filter types such as location, field of study, etc. The result of the search will be viewed as a list. The list view will have one item for each university matching the filter type and shows an overview of the University and its ranking. The application will also be used for profile evaluation of the user to provide the user with a list of Ambitious, Moderate and Safe Universities.
- Cloud Database: The cloud database stores information regarding Universities including specific details such as required GRE score, TOEFL score, GPA and deadlines.
- Server Database: The server database will store information about the user such as log-in id and password, education, work experience etc.

The notional diagram of the system is shown below

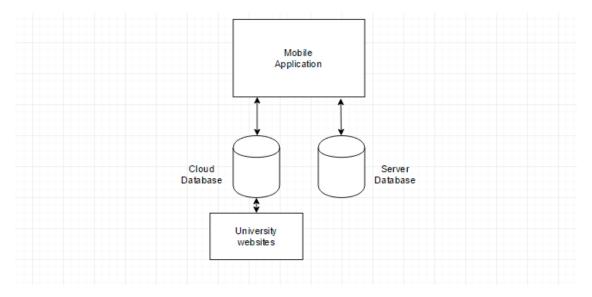


Figure 1: Notional Diagram

2.2 Product Functions

The major functions that the application should let the user perform are:

- Register for the application
- Log-in or log-out of the application
- Search for Universities
- Filter the list
- Profile Evaluation
- Get email reminders

The functions that the application should perform are:

• Real-time updating of course information

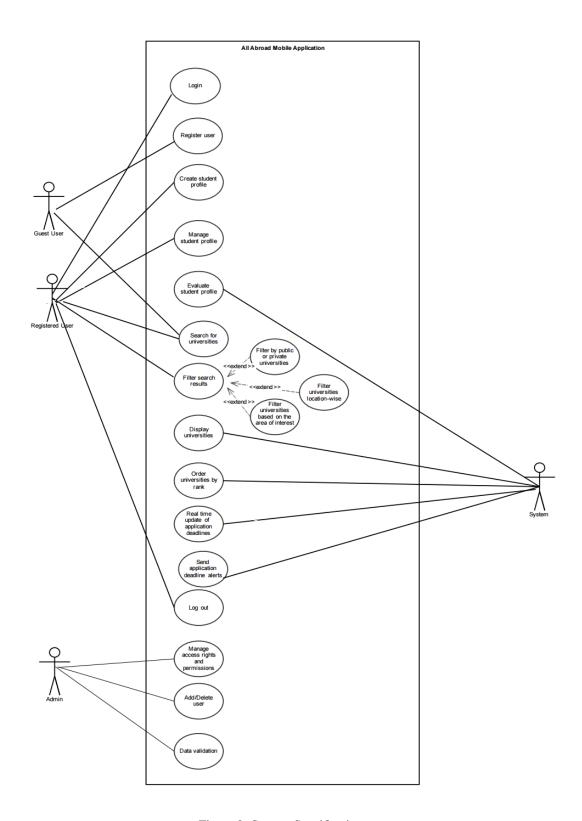


Figure 2: System Specification

2.3 User Classes and Characteristics

The two classes of Users will be international students who wish to pursue their education abroad and the Administrator. The Students can use the application as a guest user or can create their account and use the application as a registered user.

1. Guest User:

• A guest user can only view the list of Universities.

2. Registered User:

- He/She can filter the list of Universities according to rankings, geographical location or field of study.
- He/She can also enter specific profile details such GRE score, TOEFL score, GPA, Work Experience, Publications etc.
- They can get their profile evaluated based on the details they have entered.
- They will also receive email reminders about upcoming deadlines of their preferred Universities a week before the deadline.

3. Administrator:

- They will manage the overall system and ensure that there is no erroneous information on the application.
- They can also add or delete users.

2.4 Design and Implementation Constraints

The mobile application will be constrained by the read/write performance of the database. The database will store user profiles and information about all the Universities in Europe and USA. Thus, the size of database may grow exponentially. This will require us to queue incoming requests and therefore increase the time it takes to fetch data. Handling huge amount of data and serving multiple requests will constraint the performance of the application. The Hardware, Software and Communication Requirements have been specified in section 3 in detail.

2.5 User Documentation

On-line help will be made available that provides specific guidelines to a user for using the AAMA. A help link shall be provided at the top of the screen. On clicking this link the user will be redirected to a page that will provide on-line help, FAQs and customer support contact details options for customer support.

2.6 Assumptions and Dependencies

The Internet connection is a constraint for the application. Since the application fetches data from the database over the Internet, it is crucial that there is an active Internet connection for the application to function.

3 External Interface Requirements

3.1 User Interfaces

- 1. University Search Page:
 - On opening the application the user should see the University Search Page. Here the user can search for information about any university by typing the university name and clicking the search button.
 - Otherwise, the user can click on the Log-in page to register or Log-in to the AAMA.



Figure 3: University Search Page

2. Log-in Page:

- A registered user should be able to log-in to the AAMA by entering the user-name and password (Figure 4).
- A registered user can click on the Forgot password link and reset the password. A verification mail should be sent to the email address under which the user has been registered.
- A new user can create a profile in AAMA by clicking on Sign Up link to become a registered user. The user should be redirected to the Create Profile page.



Figure 4: Log-in

3. Create Profile:

• Create Profile page is shown in which the user has to first enter his first and last name, email address, password. After entering these mandatory fields the user clicks on Register button.



Figure 5: Create Account

• After creating an account the user goes to Student Details tab where the user has an option to enter the academic details or he can go to the Home page by clicking on the Home icon. The user can select his undergraduate college, enter GPA, year of graduation and the area of interest. The user can also add the GRE, TOEFL scores, publications and work experience in years (Figure 6). Once the user clicks on Next button AAMA navigates to the University Preferences tab.



Figure 6: Student Details Tab

• In the University preferences tab the users can select their preferred country where they wish to pursue their Master's. They can add their preferred Universities to the list. This will be used during profile evaluation to determine whether the student has a chance of getting into the universities.



Figure 7: University Preferences Tab

Once he is done entering the profile information AAMA redirects the user to Home Page.

- 4. Home Page: Home Page displays the various tabs that the registered user can access:
 - The MyProfile link will redirect the user to Student Details page where the user can update any information.
 - The Search Universities link will navigate the user to University search page.
 - If the user wants to get his profile evaluated he will click on Profile Evaluation tab.
 - Filter Universities tab.



Figure 8: Home Page

5. Profile Evaluation Page:

• Profile Evaluation page is shown. Here the user clicks on Evaluate Profile button after which a list of universities is displayed. These universities are classified as Safe, Moderate, Ambitious. The student can go through a detailed course and application related information for the listed universities.



Figure 9: Profile Evaluation Page

6. Filter Universities Page:

• The Filter Universities page allows the user to select the criteria for searching universities. They can be filtered by location ,course,ranking or funding(public/private universities). The user then enters the filter key which is the value for the filter criteria selected. The search result displays the universities according to the filter by the user.



Figure 10: Filter Results Page

3.2 Hardware Interfaces

AAMA will be an android based mobile application and is thus intended to be used only on devices running on Android OS v4.2 and above.

3.3 Software Interfaces

The application will be developed mainly using the following software interfaces:

- 1. Name: Java
 - Mnemonic: -
 - Specification Number: -
 - Version Number: 7 and above
 - Source: Oracle Corporation (previously Sun Microsystems)
 - Purpose: Programming language used for developing the application.
 - Definition of the Interface: Java is a general-purpose computer programming language that is concurrent, class-based, object-oriented, and specifically designed to have as few implementation dependencies as possible. It is intended to let application developers "write once, run anywhere" (WORA), meaning that compiled Java code can run on all platforms that support Java without the need for recompilation
- 2. Name: Extensible Markup Language
 - Mnemonic: XML
 - Specification Number: -
 - Version Number: 1.0

- Source: World Wide Web Consortium
- Purpose: Used for front-end development
- Definition of the Interface: Extensible Markup Language (XML) is a markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable.
- 3. Name: Android Software Development Kit
 - Mnemonic: Android SDKSpecification Number: -
 - Version Number: 4.2 and above
 - Source: Google Inc.
 - Purpose: The development environment for Android
 - Definition of the Interface: The Android software development kit (SDK) includes a comprehensive set of development tools. These include a debugger, libraries, a handset emulator based on QEMU, documentation, sample code, and tutorials.
- 4. Name: SQLite
 - Mnemonic: -
 - Specification Number: sqlite-android-3150100
 - Version Number: sqlite3Source: SQLite Studio
 - Purpose: Supporting database for the application
 - Definition of the Interface: A precompiled Android library containing the core SQLite together with appropriate Java bindings, ready to drop into any Android Studio project
- 5. Name: Google Cloud SQL
 - Mnemonic: Cloud SQL
 - Specification Number: -
 - Version Number: -
 - Source: Google Cloud Platform
 - Purpose: The database containing the university information is very large and extensive and therefore storing it locally is not feasible. For this purpose, Google Cloud SQL will be used.
 - Definition of the Interface: Google Cloud SQL is a fully-managed database service that makes it easy to set up, maintain, manage, and administer your relational MySQL databases on Google Cloud Platform.

3.4 Communications Interfaces

- All data communication (i.e. data transmission) will take place through the TCP/IP and HTTP protocol between the local application, main application server and the application database.
- The application database will store all data pertaining to the universities whereas the application server will be needed for storing user data and for performing profile evaluation computations and sending deadline alerts.

4 System Features

4.1 Register

4.1.1 Description and Priority

The Register feature allows the user to sign up for the application. The user will have to enter his first-name, last-name, email address and password.

4.1.2 Stimulus/Response Sequences

When the user first opens the application he/she will be greeted with a Register/Log-in screen. In the register scenario, he/she will be asked to enter the first-name, last-name, email address and password and click on register. If all the details are validated, the user is successfully registered. He/She is then redirected to the student details page which they may wish to fill up now or come back later and access the page using the my profile link.

4.1.3 Conditions/Constraints

- The Email ID and Password should be unique and validated before allowing the user to register
- The personal data of the user will have to be encrypted and stored in the database.

4.2 Log-in/Log-out

4.2.1 Description and Priority

The Log-in/Log-out feature allows the user to log-in/log-out of the Application. The user will have to enter their email ID, password.

4.2.2 Stimulus/Response Sequences

- When the user first opens the application he/she will be greeted with a Register/Log-in screen.
- In the log-in scenario, he/she will be asked to enter the Email ID and Password. A returning user will be asked to log-in by entering his/her email ID and Password.
- If the user successfully logs in, he/she will be redirected to their profile page.
- If the wrong Email ID or Password is entered, a message saying invalid user-name or password will be shown.
- A Log-out button will appear at the bottom right corner. When the log-out button is clicked, the user is logged out of the application and redirected to the log-in page.

4.2.3 Conditions/Constraints

- The password should not be visible as characters but instead should appear as *
- The main home screen should be loaded only if the user-name/password combination is correct, otherwise the error message should appear.
- Once the user is logged out, the user should not be able to go back into the application without logging in again.

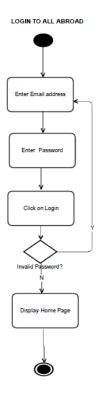


Figure 11: Log-in

4.3 Profile Update

4.3.1 Description and Priority

This allows the user to feed in his or her profile details such as GRE, TOEFL scores, undergrad details, work experience if any. These details will be fetched when the user requests for profile evaluation.

4.3.2 Stimulus/Response Sequences

- Once the user logs in, the user clicks on my profile link.
- The user is taken to the user homepage where the user is provided with an option to edit his/her information.
- The user can edit the information required and click on next.
- In the next window, the user can list the universities that he/she is interested in/planning on applying to and click finish. It will then be reflected in the portal.

4.3.3 Conditions/Constraints

• Any information that the user entered while creating a profile should have been persisted and auto filled when the student profile page is opened.

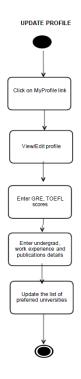


Figure 12: Update Profile

4.4 Search for universities

4.4.1 Description and Priority

The user likes to look for information pertaining to one university. Information such as accepted GRE and TOEFL scores, cumulative grade points obtained during bachelors, deadline to submit the application for all the departments in the university, application fee etc. The guest user can also search for an university and view specifics relating to the university. However, information such as the ranking, the application deadlines, acceptance rate and criteria will be hidden to guest users.

4.4.2 Stimulus/Response Sequences

- Once the user logs in, the user enters the name of a university they are interested in, in the search bar provided and clicks on search.
- The user is navigated to the university landing page wherein all the details pertaining to that university is listed in case of registered users.
- In case of guest users, he/she can only view the courses that the university offers.

4.4.3 Conditions/Constraints

• Only the registered user should be allowed to view all the details pertaining to an University whereas the guest user should have a restricted access to the application.

Go to University Search page Enter university name Display course and application related information for the university

Figure 13: Search for Universities

4.5 Filter Search- For Registered Users

4.5.1 Description and Priority

The user likes to search by applying various filters such as location, research area of interest etc.

4.5.2 Stimulus/Response Sequences

- Once the user logs in, the user enters the filter value in the search box and selects a filter type from the drop down provided.
- The filter drop-down is populated with the below values
 - Location
 - Area of Interest
 - Public/Private university
- The search key varies for each and every filter type. For example, if the user wants to list all the universities present in one location, the user has to key in the location, select location filter and click on search. The user will then be navigated to the search results page which displays all the universities in that location in the order of its rank.

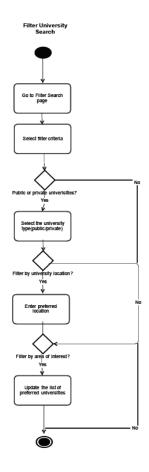


Figure 14: Filter Search

4.6 Real time update of Course Information

4.6.1 Description and Priority

The user likes to see the updated information. There shouldn't be any stale data that is displayed to the user.

4.6.2 Stimulus/Response Sequences

- The user logs in, keys in the search term and searches for the University he/she is interested in and clicks on search.
- The user is navigated to the search landing page where the information for all the departments in the university is listed.
- These information are updated in real time. A crawler is used to crawl the department specific website for the university and updates the details if there is any change.
- This operation is performed once per day.

4.7 Profile Evaluation

4.7.1 Description and Priority

The user would like to view the list of universities that are in the range of his/her profile and also likes to view the list of universities categorized as safe, moderate and ambitious.

4.7.2 Stimulus/Response Sequences

- User logs in to the application.
- User clicks on Profile Evaluation link.
- Based on the user profile, the universities that the user can apply to are categorized and displayed to the users as safe, moderate and ambitious.

4.8 Deadline Reminder

4.8.1 Description and Priority

This feature is used to send reminders to the users regarding the upcoming deadlines of the universities that the user is interested in so the user does not miss out on applying to any of the universities.

4.8.2 Stimulus/Response Sequences

• The app sends email reminder to the users when the application deadline of the universities which are enlisted by the user as interested is approaching.

5 Other Non-Functional Requirements

5.1 Performance Requirements

The requirements in this section provide a detailed specification of the user interaction with the software and measurements placed on the system performance.

- 1. Response Time:
 - TITLE: Response Time
 - DESC: The time the application takes to display search results.
 - MUST: The response time should not be more than 3 seconds 100% of the time.
 - WISH: The response time should not be more than 2 seconds 100% of the time.
- 2. Navigating between screens:
 - TITLE: Navigating between screens
 - DESC: The time application takes to navigate between its various screens.
 - MUST: The time taken to navigate between screens should not be more than 2 second 80% of the time.
 - WISH: The time taken to navigate between screens should not be more than 1 second 100% of the time.
- 3. Updating course-specific details:
 - TITLE: Updating course-specific details
 - DESC: The time taken by the application to update the database, if changes occur in the University webpage regarding deadlines, GPA or GRE/TOEFL criteria.
 - MUST: Real-time updating of course specific information.

4. Application deadline reminders:

- TITLE: Application deadline reminders
- DESC: Send email reminders when the application deadline is approaching to users who have specified their University preferences.
- MUST: Send deadline reminder a week before the deadline.

5.2 Software Quality Attributes

1. Scalability:

- TITLE: Scalability
- DESC: The number of concurrent users supported by the application at any given time.
- MUST: At least 5000 users should be able to access the application seamlessly 98% of the time.
- WISH: At least 5000 users should be able to access the application seamlessly 100% of the time.

2. Maintainability:

- TITLE: Application Extensibility
- DESC: The application should be easy to extend. The code should be written in a way that it favors implementation of new functions.
- RAT: In order to easily add new functions to the application in the future.
- DEP: None
- TITLE: Application Testing
- DESC: Test environments should be built for the application to allow testing of the application's different functions.
- RAT: In order to test whether all the functions are working properly and minimise any crash instances.
- DEP: None

3. Security:

- TITLE: Communication Security
- DESC: Security of the communication between the system and server.
- MUST: 100% of the messages sent between the system and the server during the log-in session should be encrypted using RSA key.
- TITLE: Account Creation Security
- DESC: If a user wants to create an account and the desired user name is already taken, the user should be asked to choose a different user name
- MUST: The user-name should always be unique 100% of the time
- TITLE: Firewall Installation
- DESC: The application server should be protected by firewall.
- RAT: In order to filter the incoming traffic on the server.
- DEP: None

4. Reliability:

- TITLE: Application Reliability
- DESC: The application should always display accurate data.

- MUST: The application should provide reliable search results more than 98% of the time.
- PLAN: The application should provide reliable search results more than 99% of the time.
- WISH: The application should provide reliable search results 100% of the time.

5. Availability:

- TITLE: System Availability
- DESC: The availability of the system when it is used.
- SCALE: The average system availability (including network failure).
- MUST: The system should be available more than 98% of the time.
- PLAN: The system should be available more than 99% of the time.
- WISH: The system should be available 100% of the time.
- TITLE: Internet Connection
- DESC: The application should be connected to the Internet.
- RAT: In order for the application to communicate with the database.
- DEP: None

6 Other Requirements

6.1 Usability and Human Requirements

- Within two hours of being introduced to the application a layman should be able to use the application with its complete functionalities.
- A tutorial and help page would be included for user support.

6.2 Operational and Environment Requirements

- The application will be compatible with any mobile device running on Android OS v4.2 or above bearing a user friendly and visually aesthetic user interface for ease of use and for navigating between screens (Usability Requirement specified above).
- To maintain application robustness, thorough testing will be done to ensure minimum application crash instances.
- Quality of information will be maintained by extracting data from reliable sources (Example: Only the official University web-page and not any third party source).
- In case of Internet outage, the user can access his/her own profile but cannot update the profile or view any new information.

7 Project Issues

7.1 Open Issues

• The data that needs to be stored is huge and hence the response time to serve any user request should be such that there is not much latency.

7.2 Deferred Functions

- The functionality of allowing professors to post open positions in their research team has been deferred to a future version.
- The application is currently being developed for the Android platform but could be implemented on iOS and Windows platform in the future.
- Posting on forums and discussion between peers is also deferred to the future.
- The app will be tailor-made for the registered users offering helps to individuals through dedicated tutors.

8 Appendix

8.1 Appendix A: Glossary

- Guest User: Users who haven't registered for the application.
- Registered User: Users who have registered and hence have unlimited access to the features of the application.
- Safe: Safe Universities are the list of Universities where the chances of the student getting in is 80% and above.
- Moderate: Moderate University are the list of Universities where the chances of the student getting in is 50%.
- Ambitious: These are the list of Universities where the chances of the student getting in is very low.