Bilkent University

Department of Comgputer Engineering

SENIOR DESIGN PROJECT

Project Name: UniStud

Project Specification Report

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1   Introduction

In the recent years, with the wide popularization of the web, the number of people who actively use different online platforms and applications has increased to an incredible rate reaching 3.58 billion in 2017 [1]. Among these users' statistics show that the majority of them belong to a group age between 17-28 years old, making this a very ideal target group for application developers. Students seem to use these platforms excessively but even though there are different applications that help them with several individual needs, there is a lack of applications in the market that allow them to access several services in the same time, saving time, money and energy. If you are a student enrolled in a university or even an aspiring student, you have to navigate between several applications in order to access services related to the search for opportunities, tutorials and online courses, finding books or even to exploring nearby events. What we aim to do is to introduce an alternative that allows them to access these services in a single application in a simpler and more effective way. In this report, detailed information about the platform together with its functionalities, requirements, professional and ethical issues, will be provided.

1.1   Description

UniStud will be focused on the students, the target users of our project all over the world and will offer them a platform where they can access different services simultaneously. Accordingly, the users will be able to access information in four main areas. The first category will be regarding the search for different academic opportunities such as finding universities, scholarships and internships. The students can search based on their preferences on universities and they will be provided with the university information that fits their needs and in addition with the opportunity to connect with students that are currently studying in these universities.

The main reason for this is to feed the users with real data and get a more realistic perspective on the requirements, challenges and procedures to be part of that university. In this category users will also be able to find different internships opportunities from different companies

depending on their departments. In the second category, the platform will provide an online tutorial service where the students can create and share these tutorials with others that are interested in studying a new course or improving an old one. The tutorials will be both online which will be live streamed and then stored once they are finished and private which will be based on user agreement. The third category will be related to study materials where the users will have the opportunity to buy/sell/exchange/loan any important study materials such as books, notes, devices etc. Finally, the last category will be regarding student events where the user will be able to keep track of all the events happening around.

UniStud will be offered as a Web service and as an Android application, in this way reaching a higher number of users and operating better according to the demand of the users.

What makes UniStud innovative, is the fact that all the information that student needs is distributed in huge variety of websites without a link between them to attach all the data and keep students updated with everything happening around them. In this way, every student will have the possibility to access any information at the moment that the information is leaked. The users will not miss on new opportunities and will easily engage into their educational path.

1.2 Constraints

1.2.1 Implementation constraints

- GitHub will be used to host the source code while it is being edited and it will allow the supervisor to look at the source code to see how it is progressing.
- Open source libraries will be used to enrich the application with interesting features.
- The application will be initially deployed on Web and Android.
- Application will be based on server-client architecture.
- Application will be developed based on OOP style.
- The mobile application will be developed using Java Programming language.
- Vimeo Livestream API will be used to show real-time video based on preference of students.
- Google Maps API will be used to show data demographic data for students.
- Firebase API will be used for security purposes, such as two-step verification.

1.2.2 Economic constraints

- There will be no cost from the usage of the open source library.
- For Android^{TM} platform a fee of $25 USD is required so the application can be published on Google Play. This is one-time payment.
- A cost of $12 USD is required for 1-year plan of domain.
- A cost of $50 USD is required for 1-year plan for hosting provider.
- Two-step verification requires a cost of $5 USD for every 100 SMS after 10000 free quotas.
- Additional fees might emerge from exceeding the request quota of Google Maps API.
- The initial deployment of the application will not be funded by any organization and we will be taking care of any cost from our personal budget.
- External capital might be raised for further development of this application.
- Cost of marketing and collecting data for potential user is estimated to reach $100 USD.
- The application will be offered to users for free.

1.2.3 Ethical constraints

- Development, Promotion and Deployment of the application will adhere to the NSPE Code of Ethics. [2]
- The application will not distribute sensitive or confidential data with third-parties. The privacy and satisfaction of the user will be the main concern.
- The user will only be available to access their information after a successful authentication.
- Location of the user will be used for demographic purposes without giving any other detail of the user.
- The application will use third-party data obtained by the APIs provided by Google, Facebook.
- Suspected illegal or unethical activity will result in the termination of the account forever.

1.2.4   Sustainability constraints

- The team will be looking for real-time user feedback to improve the functionality and the services of the platform.

- A prototype of the application will be deployed in Albania to experience real users based on the data taken from marketing during this period.

- Agreements with universities can result in beneficial outcomes for both parties. Another source of income can be the in-app advertisement and collaboration with potential investors.

1.2.5   Social constraints

- The application will protect users into getting access to illegal digital resources. A functionality will be provided to report cases that do not adhere terms and conditions of the platform.

- The application will be initially released in English language with the intention to upgrade into a multi-language platform based on the requests.

- The content will be regularly monitored to ensure alignment with the scope of the application.

1.3   Professional and ethical issues

- User's private data will not be shared among third-parties or otherwise. Moreover, all the user data on the server will be encrypted. In case the application come to an agreement with a third-party in the future, the user will have full authority to choose which information are allowed to be shared.

- Application will be using login APIs of Google and Facebook. In this way the application will be able to manage user information easier and safer, but if the user does not to login using these accounts, they will be asked to register by using a valid email. These users need to pass the two-step verification to have a verified account.

- The codes included in the application will either be from out development or free source. If the application includes free source codes, this will be indicated. Any additional source relevant to the application will be properly documented.

2 Requirements

2.1 Functional Requirements

2.1.1 User Profile
- Everyone with a valid email can sign in/sign up for the platform.
- For the accounts, there will be a two-step verification.
- The platform is not intended to operate as a social network even though it will include communication between students for a variety of purposes.
- The user's profile will have the student personal information such as university, department, country and area of interest.
- The user can access the internship's list of the companies provided in the platform.
- The user can search the information in the platform, in order to find their wanted information related to their searched universities.
- The user will be able to offer online tutorials for specific courses.
- The users can attend online tutorials and make questions related to the topic.
- The users will get notified for the events and tutorials they have joined.
- The users can buy/sell/exchange/loan study materials from each other.

2.1.2 Platform Data
- Only students will be able to offer online tutorials.
- Companies can add internships opportunities in the portal without having an account.
- Different organization can add events in the portal without having an account.
- There will be a map showing demographic data of the students using the portal.
- In different scenarios (such as searching for a university), sensitive data of the students studying in the corresponding university will be filtered out.
- A rating system will be used for students that offer online tutorials.

2.1.3 Storage
- As the platform grows some of the online tutorials will be gathered together into collection after live stream has ended and will be stored to our servers indefinitely. However, retrieving these tutorials would require to describe clearly the appropriate

information with respect to tutorial. The students might contribute to "resolve" difficulties accessing these tutorials by adding other relevant information.

2.2   Non-functional Requirements

2.2.1   Usability

- The system should be user-friendly and it should be very easy for the users to interact with it.
- The content in the system should follow the same standard everywhere in it.

2.2.2   Reliability

2.2.2.1 Robustness

- The system should be able to withstand a high number of uses at the same time.
- The system should be able to operate without a failure for a long period of time.
- Probability of failure should be less than 0.03.
- MTBF should be larger than 3000h.
- A system crash should not result in data loss.

2.2.2.2 Security

- Third parties should be prevented from breaking into our system and accessing any kind of data from it.

2.2.3   Performance

2.2.3.1 Efficiency

- The response time of the system should be less than 1 second.
- All user inputs should be acknowledged within 1 second.

2.2.3.2 Scalability

- System should be able to accommodate increased volumes, workloads and users.
- The minimum number of users the program should have before starting to slow down is 5000.

2.2.3.3 Throughput

- The system should be able to handle at least 500 transactions within a minute.

2.2.3.4 Availability

- The system should be available for more than 98.3% of the time and for every student around the world.
- Elapsed time for system to recover from incident and failure should be less than one day.

2.2.4   Extensibility

- Design and implementation of the system should allow it to be able to cater future changes.
- System should be able to manage new entities or provide new feeds.

2.2.5   Modifiability

- Dependencies in the system will be minimized in order to allow quick updates in the future.

2.2.6   Maintainability

- The system should be designed and implemented in such a way that it will optimize the ability of a maintenance personnel to revise or enhance it.
- The degree of flexibility should not affect any of the components, services and functionalities of the server.
- Elapsed time for system to recover and come back to its normal state following an incident or failure should be less than one day.

3   References

[1] INTERNET USAGE STATISTICS The Internet Big Picture. (n.d.). 2018
https://www.internetworldstats.com/stats.htm. Accessed: 2018-10-14.

[2] Code of Ethics National Society of Professional Engineers, nspe,org, 2016. https://
www.nspe.org/resources/ethics/code-ethics/. Accessed: 2018-10-12.