STUDENT PROFESSIONAL PRACTICE MARKET STUDENTSHIP

A THESIS SUBMITTED TO
THE FACULTY OF ARCHITECTURE AND ENGINEERING
OF
EPOKA UNIVERSITY

BY

LEDIA LEKA

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR BACHELOR DEGREE
IN COMPUTER ENGINEERING

JULY, 2021

DECLARATION

I hereby declare that the thesis is based on my original work except for quotationsand citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Epoka University or other institutions.

Ledia Leka

FACULTY OF ARCHITECTURE AND ENGINEERING
DEPARTMENT: COMPUTER ENGINEERING ADVISOR:
DR. IGLI HAKRAMA

ABSTRACT

"STUDENT PROFESSIONAL PRACTICE MARKET" is a system created for the students of thelast year of their degrees in every Albanian university which follows them even during their alumniexperience. This system is created as a necessity that students have before starting their careers and then as a network provider after they have finished their academic duties. The system will collect the students of every university with the sole purpose of securing each of them aprofessional practice, without which none of them can graduate according to Albanian law. It willbe controlled by the universities themselves which will make the process easier, concentrated on the students and fairer related to the meritocracy. The last important element in the system will becompanies interested in hiring interns for different and numerous job positions in every field.

This thesis will present to you the three columns of the student integration process in the work environment.

The first column, the most important one is the university. The role of the university is simple butfundamental. Each new semester the university and its representatives will make part of a databaseall the undergraduates that have selected Professional Practice as a course. Only the students approved by the university will be part of the "job market". Every other user will be prevented at the registration process.

The registration process will be more then turning a visitor into a user. This process will help the student create its profile which will work as a resume and as a portfolio at the same time. Since the majority of the students do not have proper work experience, the idea is to help them present their skills and values aside to their achievements as a mean to replace the interviews and not be just another CV in a pile of papers in an office.

The company registration process has the same composition, it creates an account and a profile which presents the company to the student as a poster, eye-catching, interesting and useful withoutthe load of information which damages the confidence of a student who is not as qualified as a professional. The company has the opportunity to post various job positions and take loads of submissions. The finalization of the process is hiring a student who satisfies the requirements of the company and adding this new intern in a contact book to reach whenever needed even when his status is changed to an alumnus.

The main idea is to simplify the process, create a platform for unexperienced, talented students, save more time and arrange the appropriate combination between the student and the business/institution.

Keywords: students, system, career, network provider, professional practice, job positions, account, resume, hiring

FAKULTETI I ARKITEKTURËS DHE INXHINIERISË
DEPARTAMENTI: INXHINIERIA KOMPJUTERIKE UDHËHEQËS:
DR. IGLI HAKRAMA

ABSTRAKT

"TREGU I PRAKTIKAVE PROFESIONALE PËR STUDENTËT" është një sistem i krijuar për studentët e vitit të fundit të çdo universiteti shqiptar. Ky sistem i shoqëron ata dhe gjatë eksperiencës së tyre post-universitare. Ky sistem u krijua si një nevojë që studentët kanë para se fillojnë rrugën e karrierës, ndërkohë që pasi ata të kenë përfunduar detyrimet akademike do të shërbejë si nje urë lidhëse mes ish- studentëve dhe punëdhënësve. Sistemi do grumbullojëstudentët me qëllimin e vetëm për të siguruar një praktikë profesionale, pa të cilën asnjë prej tyrenuk mund të diplomohet sipas ligjit shqiptar. Procesi do kontrollohet nga vetë universitetet për tëqënë më i thjeshtë, të ketë në qendër studentin dhe të ketë një nivel më të lartë meritokracie. Elementi i fundit shumë i rëndësishëm i sistemit do jenë kompanitë e interesuara që të punësojnë studentet për pozicione të ndryshme dhe të shumta pune në çdo fushë.

Kjo tezë do ju prezantojë tre shtyllat e integrimit të studentëve në tregun e punës.

Shtylla e parë, ajo më e rëndësishmja është universiteti. Roli i universitetit është i thjeshte, por thelbësor. Çdo semestër, universiteti dhe përfaqësuesit e tij do bëjnë pjesë te sistemit dhe databazës të gjithë studentët e arsimit të lartë që kanë zgjedhur si lëndë "Praktika Profesionale".Vetëm studentët e aprovuar nga universiteti do të bëhen pjesë e "tregut të punës". Çdo përdorues tjetër dondalohet të regjistrohet në sistem.

Procesi i regjistrimit do të jetë më shumë se një proces që e kthen një vizitor në një përdorues. Kyproces do i ndihmojë studentët të krijojnë profilin e tyre, i cili do të funksionojë në të njëjtën kohë si CV dhe si portofol punësh. Meqënëse shumica e studentëve nuk kanë eksperiencë pune që lidhet drejtpërdrejt me fakultetin që po kryejnë, qëllimi është t'i ndihmojmë ata të prezantojnë aftësitë dhe vlerat e tyre përkrahë arritjeve që kanë, si një mënyrë për të zvendësuar intervistat e punës dheqë mos përfundojnë thjesht një CV më shumë në një grumbull me letra mbi një tavolinë zyre.

Procesi i regjistrimit të kompanisë ka të njëjtën formulë. Kompania krijon një llogari dhe një profili cili e paraqet kompaninë para studentit si një poster, tërheqës për syrin, interesant dhe i dobishëm, pa fjalët e tepërta te cilat dëmtojnë vetbesimin e një studenti që nuk është mjaftueshëm i kualifikuar sa një profesionist. Kompania ka mundësinë të postojë pozicione të ndryshme and të marrë shumë aplikime. Finalizimi i procesit është punësimi i studentëve që përmbushin kërkesat dhe nevojat e kompanisë dhe përfshirja e këtij praktikanti në një listë kontaktesh, për t'u kontaktuaredhe pasi statusi i tij ndryshon në "ish-student".

Ideja kryesore është të thjeshtohet procesi, të krijohet një platformë për studentë të talentuar, pa eksperiencë, të kursehet kohë dhe të krijohet kombinimi i përshtatshëm mes studentit dhe biznesitapo institucionit.

Fjalë kyçe: student, sistem, karrierë, rrjet, praktikë profesionale, pozicion pune, llogari, resume, punësim

To my unconditional support system, my family

ACKNOWLEDGEMENTS

I would like to thank every professor of every course who have taught me throughout the entire my university experience. Their lessons and advices have been fundamental for be to become a future engineer. I would like to express my appreciation to Mr.Igli Hakrama for helping me choosemy thesis theme and for helping me every time I needed advices and support. I could not choose abetter and qualified supervisor for my thesis project. The ideas and suggestions given by him, made my job easier and took my project a step further. I am forever grateful to my family who have encouraged me to be the best version of myself and to never stop working on going further in life. I owe to them everything. I want to thank all my loved ones for being there during the endless process of learning and always believing in me. Thank you!

TABLE OF CONTENTS

LIST OF FIGURE

1 INTRODUCTION

Based on a study made about the job market after the graduation by "Leadership and Growth Council in Kosovo, 48% of young people interviewed that are already employed, declared that their current job is not related to their university degree [1].

There are many obstacles that lead to unemployment or to jobs that are not related to the academic profile of that individual but the main motive is the lack of previous job experiences. As an undergraduate myself, who has not been considered by many companies for this specific reason, Ibelieve that making professional practices an obligation for students creates a teaching culture in many Albanian businesses and makes them more accepting to young, talented people who have not had their chance to prove themselves as this will be the new norm. I believe many companieswill begin to see these unexperienced students as a value and as a "worth it business deal", which may sound opportunistic but is actually capitalism, and it is the definition of how the world worksin our time.

According to a study made in Kosovo from a leadership non-profit organization, turning professional practices into an obligation may not result to be as positive as we imagine, because of the lack of professional observation during the mentorship and because of not being taken seriously by the students as a result of the payment absence. The statistics showed that only 58% of the students found the professional practice program helpful and useful to get them prepared forthe labor market, while 27% did not benefit from it. The last percentage of 27% were somehow

content with the results of these internships, ‘somehow’ being the key word [2]. As we are awarethe situation in Albania is not very dissimilar. The process here is exactly the same and the appreciation a student gets from the company is very non-satisfiable. Even though we may expectthe contrary, most of the interns, after the practice is finished do not get a job offer. One reason forthis is because the company was not really interested to begin with, only used the free work force.Another reason is that the student was not provided with the needed mentorship and thatprofessional practice was worth only the wasted time. But certainly, we cannot exclude the fact that the student may not be good enough for that job position.

Another issue is that many universities in Albania do not have functional Career Offices and do not have a support system for students to provide them what they need. The consequences are thatstudents need to find these opportunities themselves by taking risks or by focusing on the wrong affair, because there is not a wide career market for every degree in our country and also becausenot every student has access or is notified for a professional practice in which he/she may be interested and qualified.

Minimization of bureaucracy and maximization of mediation skills are two other challenges related to employment [3]. I think the reality of this statement is emphasized when talking about students due to the absence of consideration towards them. This is another main reason why students start focusing on jobs they have not studied for or jobs that do not even require the qualifications they have.
For all the above reasons, I think it is very necessary that there exists a system, which will help students be part of the marketplace and apply into practice all the theoretical concepts and knowledge that they have committed to. Even though many students may not find themselves working in the same sector in the future, professional practice will help them self-exclude and change career path.

Many similar systems have been created before, many websites still exist, but I believe there is nota proper system that will make the difference. That is what I am trying to change and I think this approach may be more successful than many others that predated it.

Only a few universities in Albania control the process of their students’ professional practice andeven less universities have created physical and virtual structures for students to apply

for an internship or to have a chance to get informed about companies, businesses, institutions by a careerfair, career office or a similar approach. The conclusion we get is that the whole process may appear as a burden to the people in charge that is why I wanted to make their occupation as easy as possible.

“Studentship” will be a platform where university has control over the undergraduates that deserveto be part of it, which are the students that will be graduated and looking for a job in a few months.An approved staff from each university needs to update the list of students at least once a semester.One representative from each university needs to be identified and confirmed as the person in charge by the system manager. The verification will be made by signed documents.

This new list of students will be used as a refence for the students allowed to register in the system.In the case that their credentials do not match with any of the students that the universities claim,then those students cannot be part of the platform. This is a dedicated program.

The student registration does not only consist on getting their personal data to create a profile. Thisregistration requires from the student to fill fields about education, work experiences if there is any and most importantly about the skills, strengths, the way he sees himself professionally and not only. This approach eliminates the need for an interview, but even if does not, the employer has the opportunity to contact the student from inside the system. The student data in generated inan unusual form for a CV, which makes this applicant not another one in the list. It is generated into a profile which has all the employer needs to know about the student. The potential employercan see his work and even can download the classic CV format if that is necessary.

The company registration consists on the same method which draws more attention and makes the company or applicant memorable. To be emphasized is the fact that all the businesses in the systemwill be on the market because of their own needs and wishes and will only get applications on thejob listings they have posted themselves.

This way we know they need the students; they want the students and the students' application will be considered and they will be appreciated.
This system gives equal opportunities to everyone and allows them to present themselves in the way they want, in the best way possible. The selection of the interns is done only because of the skills, abilities, their portfolio and the requirements they fulfill. Students can easily find the job they deserve in simple helpful steps and universities do not misuse resources.

This website is written by using PHP as backend, MySQL for the database and HTML, CSS, JavaScript for the front end.

2 LITERATURE REVIEW

Fernandes explains in his study about graduates preparation for professional practices that some recommendations in help of the students are student-centered engineering programs which foster the development of soft-skills, link the theoretical and industrial practical and provide design experiences to students. According to this, to engage students in the learning process and to guarantee higher quality at undergraduate programs, new educational methods and strategies are needed [3]. This was the result of a study made by a Portuguese university in an engineering program. What happened is that they changed the way that 4 from 5 courses had their lessons, andturned all the theoretical lessons into practical ones to prepare students for the professional practices. According to them interdisciplinarity is the base of this way of studying because it makesstudents understand and put to practice various subjects to solve large open-ended projects, by putting together the theoretical part and the practical one. Team work and project management aresupposed to be developed to students during this project which was a professional practice simulation in a university.

According to students, PBL focuses on deep-level learning and critical thinking, as the development of the project provides a real-life context for linking theory to practice. In this way, students relate their work to broader and professional situations outside the academic world. Students were greatly satisfied with the level of interdisciplinarity fostered by the projects' goal and assignments [3]

This entire experiment shows how important it is for students to have a similar experience in university as they will have in a real-life job, where you need to put all your knowledge to practiceand where not all the theory that students study for, will be needed in the future. Also, jobs and job- like experiences teach students skills that cannot be taught in schools, that are essential to bein a resume when applying for a job. Most of companies need an employee who knows how to communicate, how to work in a team, how to lead, how to follow, how to find solutions, how to work smart and hard at the same time. These are skills that cannot be taught in schools or universities by reading books and reproducing. That is why professional practice should be even more emphasized that it currently is, since it is not that easy to change the entire undergraduate system even when the purpose is to make it better.

All around the world, there is a general implementation of courses that prepare students for professional practices.

According to IGI Global, their observations show that business executives and employers complain about the graduates lack of practical competence, their lack of ability to build useful systems, to formulate/defend proposals, to draft simple project budgets, to write memos, prepare agendas, work on terms, basically anything related to corporate life. Employers state that graduateslack a passion for learning. Also, that the concepts offered to students by the curriculum, could really well prepare researchers, but not practice oriented engineers. [4]. That is why students struggle to get employed and why many companies do not give a second interview to newly graduates and we cannot blame them. But in many countries and foreign universities, there are courses which prepare you about different requirements that companies may have.

“University of South Australia” provides a course titled “Information Systems- Professional Practice”. Based on the syllabus, this course teaches students about communication skills, presenting, writing a report, formal document structures, formal communication skills, developingCV, referencing, teamwork and collaborative work environment, team structures and organizations, professional ethics and many more topics based on the degree being attended. In my opinion, this is a must have course in every university. If a student can excel

this course, companies would be more acceptive, because that student knows the basics of working in a company, in an office, in a corporate and so on. This approach with similar courses is implementedin many universities all around the world but not in Albania.

Career services and employment professionals are involved in this process in a partnership effort with a common goal of achieving the best match between the individual student and the employingorganization. This partnership effort traditionally involves students, but may also involve alumni,community members, prospective students, and/or faculty/staff [9]. As a student at "Epoka University" I am somehow informed about the work that the career office at our university does. Students and alumni get emails from time to time that notify them about different work positions and internships. This is very great opportunity for students to find which opportunity suits them better and apply to that position. They still have to go through the entire process of applying for ajob by using the common way, which is a great disadvantage for a student, when in that job will apply people who have experience or who have more qualifications than a student.

However, this is not the biggest issue. With a simple Google search, we can notice that the only university career offices in Albania, are those of the private universities. According to INSTAT statistic, around 87% of the students study in public universities. It means that these students do not have a functional career office in the university in which they study.

Usually, career offices create many opportunities for students to get in touch with various companies. One of the most ideal form of networking and presenting yourself as a student are career fairs. These fairs provide the great opportunity to hear live about a company and to communicate with its representatives. Each student may present himself/herself in the best possibleway, may talk and show the skills and abilities during the conversation. Also, each of the companies in the fair, is there by its own will, it wants to get in touch with students, hire them, work with them and this helps the student in so many ways, professionally and mentally.

If career fairs would happen more often in every university, less students would struggle to find aprofessional practice or a proper job.

There are certain companies which offer professional practices to students part-time or full-time and post these declarations online, where everyone has the possibility to find them and apply. Thenumber of these businesses is small and can only be found by a thorough search, since there is nota certain place where to find all the professional practices available or the companies which requireinterns. As many students may not know, Municipality of Tirana also has a program and a arrangement with many universities, related to professional practices. They have an email and a portal where students may apply.

Another source to find professional practices is "Programi Kombëtar i Praktikave të Punes". Thisprogram is very unknown among students or even graduates. Professional practices that can be found through this website last three months and the interns become part of the government institutions. Where is the catch?

The mentioned webpage is not updated since 2019 and that undergraduates are not allowed to apply to any of the practices.

After going through every possibility there is to have a professional practice in Albania and seeinghow they do not fulfill the basic requirements of a professional practice, there is the need to find or create something new.

One of the proposed strategies that Zaharie has presented in her study [10] to help undergraduate and graduate students to integrate into the job market is the establishment of institutional connections between universities and companies. These connections may result beneficial for every student since companies may offers internships and mentorships programs which enable undergraduate and graduate students to get the initial work experience needed to be hired in the company they were working as interns or in other companies of the market [11] .The connections should exist because the name of the university approaches companies, but I think that the university should not be included a lot in the process because of the shown negligence that manyuniversities may have, and that takes us to a nonfunctional system. I think the role of the universityshould only be monitoring the students who can access the system, so the process can be fair and trustable.

As White and Walter have shown in their research [12] internship programs are not beneficial onlyfor participating students, they are also profitable for companies that offer these kinds of programs because they increase the worker productivity, decrease hiring risks, increase the number of potential candidates for any job offered by the company and also decreases the staff expenses fora particular time [11]. When companies are doing something because of their own interest, it meansthat they will do it the right way. No company will take the time and enter a system when it is doesnot have any profit. This means that the system will attract companies that are in need of interns and want to hire them, no matter the reason why.

About the students, why should they be part of such system?

The students have to find a professional practice during the last year of their degree. It is very difficult for students to find a professional practice, mostly when they do not have any support. This system will be the support they need since it will be easier to have everything in a place, especially when that place makes the process easier and less demanding.

3. SOFTWARE ANALYSIS AND SYSTEM DESIGN

3.1 Project Overview

This project targets university students and mostly those undergraduates that have not started theircareers and do not have a job, experience or professional practice related to their degree. Each Albanian university will enter these students into a database to make it possible for the students toenter the system. Other students, graduates, undergraduates, alumni or any other category, cannotbe part of the system if they are not approved by the university that they currently attend. Each interested company that is in hunt for interns or employees may become part of the system. The student may search for jobs or companies and may apply an unlimited number of times. The company chooses the candidate it deems appropriate.

3.2 Project Purpose

As a student of a top university in Albania, the structures of the university made it possible for each of the last year students to apply in three companies for their professional practice course. However, only a few of the students that applied earned the opportunity to be part of these companies, for many reasons. The main reason: the pandemic, the second main reason: these companies were not interested in mentoring, some did not have the resources and the others did not have vacancies. On the other hand, the major part of the state universities do not provide any assistance in this process, which makes the process even more stressful and complicated since allthe weight is left to the student.

With this project I wanted to lift the weight from the student and evenly distribute it to all three units because I believe that students who have work experience in their field of study, will get better at it, will work for it and will be an asset for the job market and beyond. Success stories motivate, promote and set examples. This is also my motivation.

3.3 Product Context

This is a non-profit system which helps and supports education and employment that is why this system should be managed by "Ministry of Education". This is not the first system created as a career catapultier, but none of the other similar systems were this focused on the students, nor involved the entire educational system. Most of them were focused inside the university or as jobhunters. This makes "Studentship" an independent system, not related to similar projects and frommy point of view as a student very necessary to be implemented by the government.

3.4 User characteristics

A system user is a stakeholder, a person which uses and exploits the system. The users of this system are:

System manager: A qualified person which will take care of the system and maintain it. This userwill provide the universities with their credentials before they are registered, will fix the errors thatmay be encountered and will manage the users.

University / University representative: Each university will be represented by authorized user. In case the university needs more people to work on the task, each on them can log into the same account. This way they can easily access the data, there is less place for mistake and do not overload the system. University will add the name and other data of each student that has to complete the professional practice and delete them after they are done with it.

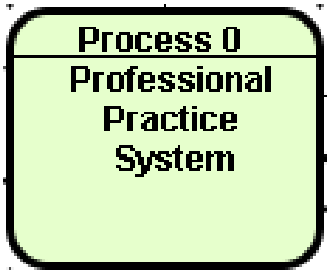
Company/Business: Company creates an account accompanied with a profile that gives details about the company. Companies may post jobs, may hire students, may download their CVs, may visit students' profile and may contact them. The actor may edit its profile and update it.

Student: Creates account based on the university's list of students. Creates a profile which works as a resume. May edit and update the profile. Students may search for jobs, check company profile,check job requirements. They may apply for jobs and after the confirmation

of the company decides on accepting the offer or not.

3.5 Data Flow Diagram

Data Flow Diagram also referred as DFD graphically illustrates the way that data is processed by the system input/output wise. This diagram focuses on the way that the data is stored in the system,where it comes from and where it goes to, in less words, the flow of the data within the system. DFD shows every process that is related to data management. Data Flow Diagrams are part of a hierarchy, because they start from a very concentrated diagram and level by level they expand andgive more details about the system itself.
The DFD symbols that represent the flow of data are four:



Process – data is considered as input when it first enters a process which modifies it, uses the data,processes it and then generates it as an output of another form, used by another user of by another function.
Processes are identified by a name. Each process should have at least one input and one output.

Data flow – represents the route of the data between processes, data stores, external entities. The arrow is named with the data that it moves and takes to the other elements.

Data Store – is used as a place that stores data from processes so they can use it in a second time.

External entity – is a user of the system, a person, a business, an institution that enters data into the system and gets data as an output from it. External entities are not part of the internal boundariesof the system, just like their name recommends.

3.5.1 DFD Level 0 – Context Diagram

Context level diagram shows just an overview of the system and contains only one process which is the name of the system. Context level diagram includes all the external entities. No external entitycan be added in the other levels, if they are not in level 0. Data flows to and from them connects the external entities to the main process.

The one and only process of this Level 0 diagram is 'Professional Practice System' since this is thesystem that I am creating. There are only three external entities because the system has three users,university, student and company and there are connected to the process by input/ output named dataflows. The name explains the type of data being flown around. Every user enters authentication data into the system. Student and company, both enter their data into the system, while university only enters the list of students. Company sends as input into the system, email for students and jobpost data to list a new job position.

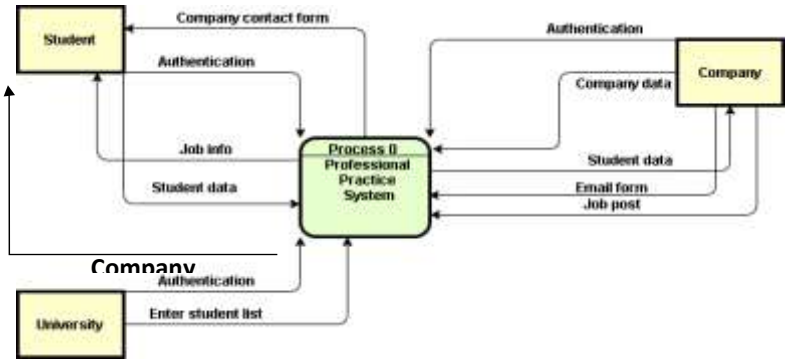


Figure 5. 1 DFD Level 0

Students get from the system data about the company, about the job, and the emails that the company may send. Company gets from the system the entire data related to the student, such as their contact, their profile and so on.

3.5.2 DFD Level 1

Level 1 DFD expands the main process and looks closely at the system. It represents details of theactivities that the processes perform. It is usually more complex and has many more data flows to the same external entities.

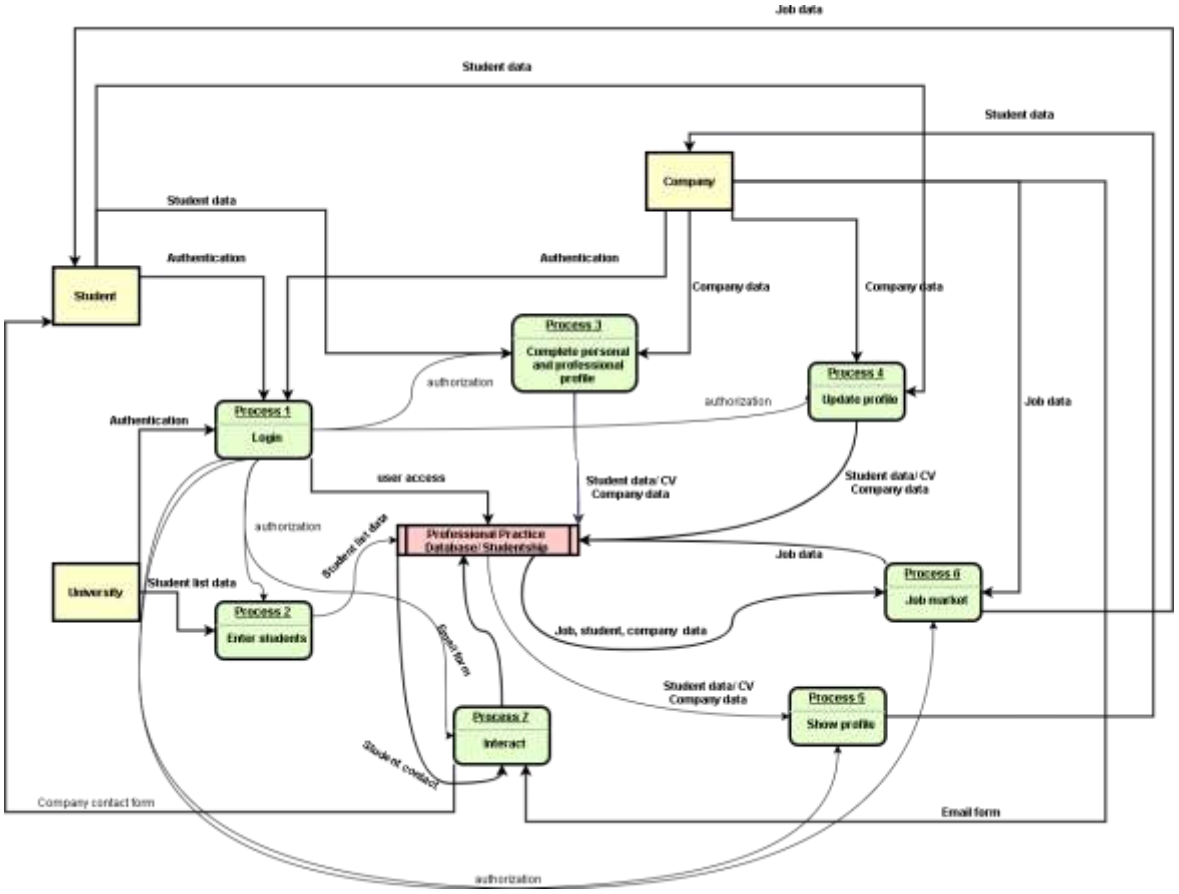


Figure 5. 2.DFD Level 1

The main process of the context diagram is now expanded into 7 processes. These 7 processes get data as input from the external entities, which are mainly the same data flows as the previous diagram, distribute data within each other, store data into the database, which is the data store of the system, where data is stored and then reused. Then from the processes data is outputted and is directed to the other processes, to the data store and most importantly to the external entities whichare the users for whom the system is created.

3.5.3 DFD - Level 2

Level 2 DFD focuses on a process of the previous level that has many data flows and treats it as a context diagram. In this level we extract that process and expand it to analyze thoroughly.

Job Market - DFD Level 2

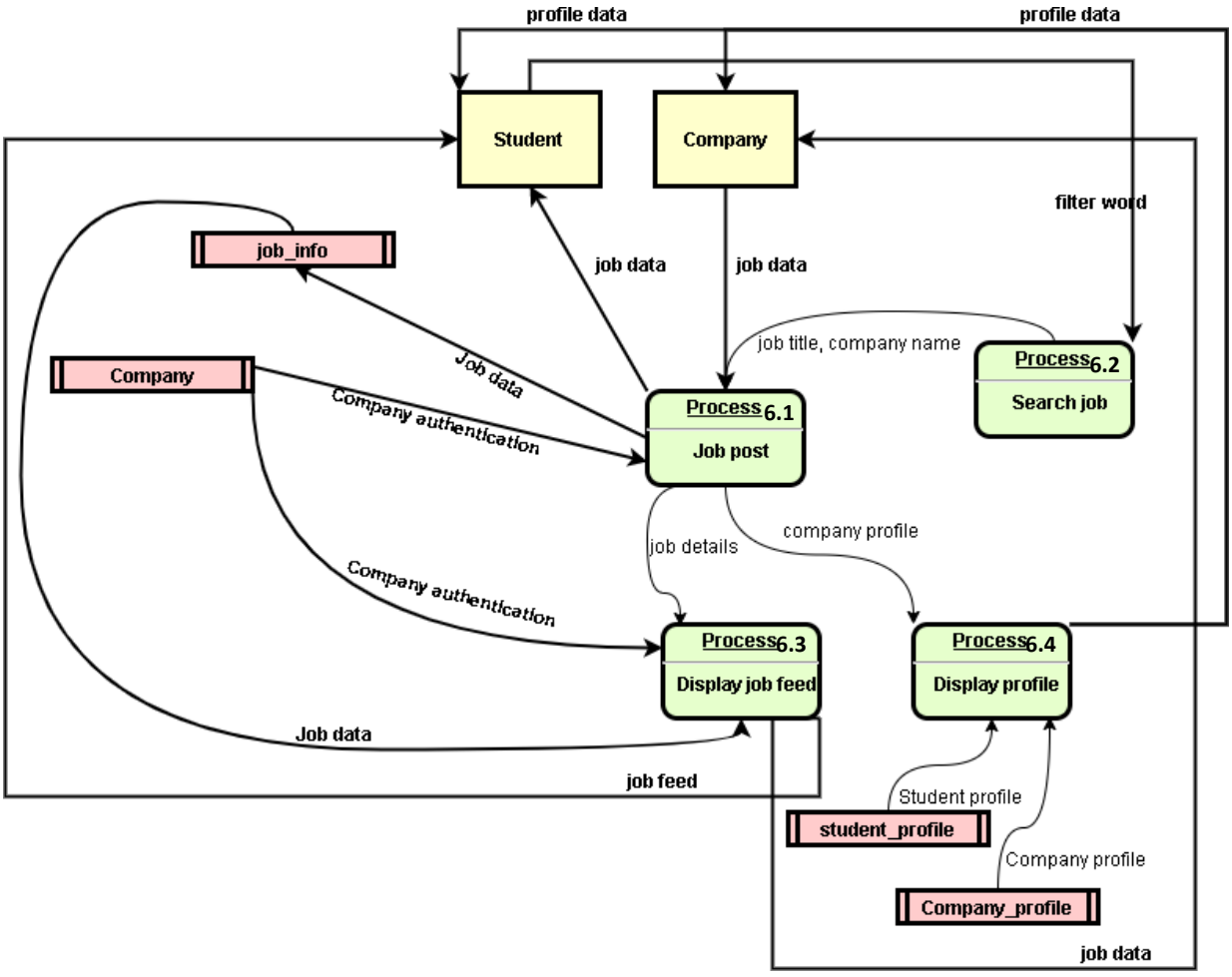


*Figure 5. 3.*DFD Level 2 – Job Market

In this diagram the ‘job market’ process is expanded to more processes that describe all the actionsthat are taken on the data into the job searching part of the system. Only two external entities take part into the job market. There are four processes that are part of the diagram. As noticed at the diagram, students only search for the job or the company and they get in return the profile of the company, the posted job and the feed of all the jobs posted. Company posts the job by entering information about it and gets in return all the posted jobs in a feed and the profiles of the students.Authentication from the data stores is required to perform some of the processes and also to load data into the profiles to be visited by users.

Interaction – DFD Level 2

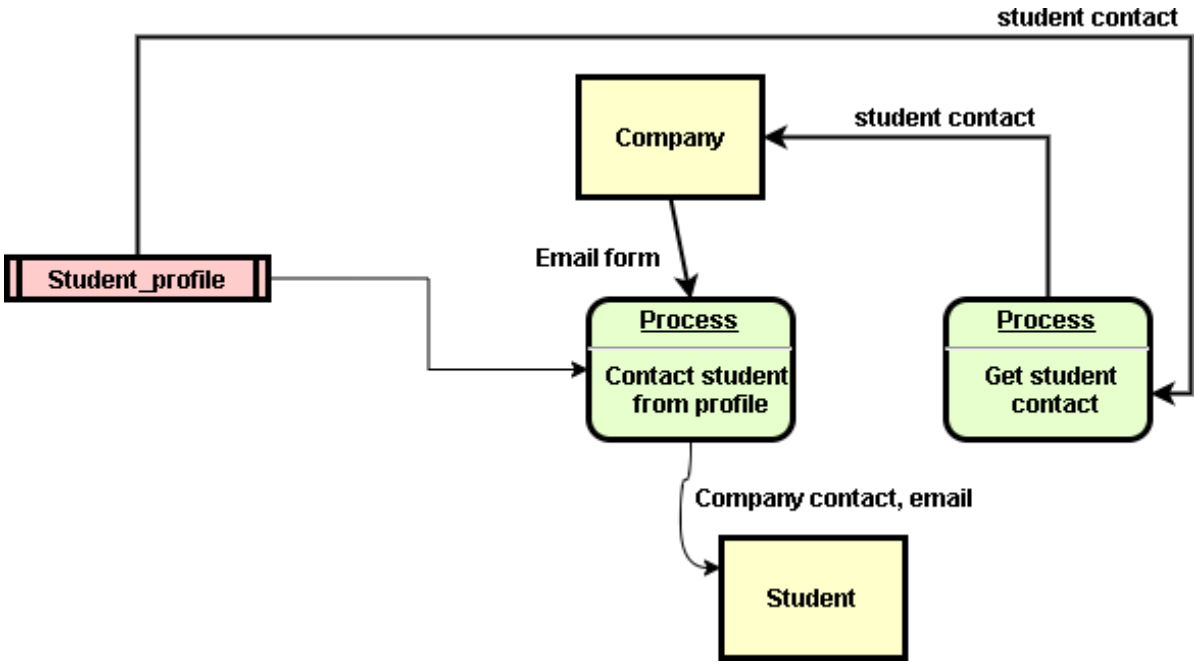


*Figure 5. 4.*DFD Level 2 - Interaction

Interaction is the system is initialized by the company towards the student by sending an email through the student profile. By contacting the student, student has access to the contact informationof the company. Student profile is courtesy of the database and the source to student contacts, whichis sent to the company

.

Requirements

3.6 Functional Requirements

A Functional Requirement (FR) is a description of the service that the software must offer. Itdescribes a software system or its component [5].

3.6.1 University functionalities

The university representative registers in the system by providing documents which prove her work position and her personal information. A document representing the approval of the university rector should be included. The university sends a registration request to the system manager. After the registration is approved, the chosen credentials are used to log into the system.University representative may make part of the system an unlimited number of students that havetaken professional practice as a course, or that are in their final year of study. University has a show students page where each of the added students is shown. University may delete all studentsat once and also may delete them one by one, but only from its list, not from the system. This pagemay only be accessed by university as it provides private information of the students. University may not access the students' activities and may not control their applications.

3.6.2 Student functionalities

Students may register only after their university has added them into the system, otherwise the student cannot create a profile and may solve this issue only by communicating with their advisor or another university instance. The student should register into the system by filling the input fields. Several of the input fields are for authentication and the others are used to create the profile page which shall perform as a resume and as a portfolio. Students may edit their profile,but may not delete any of the fields. Students may change their password and their status. When they finish their last year of university, their status should be changed to 'alumni'. When they become part of a professional practice, they should change their status to hired. Students may findpractices on the feed, and also may search for them or the company by using related key words. Astudent may access the company profile and the jobs it has posted. He/she may not contact the company directly even though the company may contact the student. Students may apply to a jobby clicking the dedicated

button. If the company hires the student, he may accept the job or just ignore it.

3.6.3 Company functionalities

Company register process does not have any condition, on contrary to the student's and university's process. Companies need to be registered with their NIPT because this makes the process more legitimate when the users are serious businesses. They need to complete the fields. Several of the fields are used to create the profile of the company with the information that that company has chosen to present itself. Company may edit its profile and data, may change the password and also may delete the profile. Companies may contact students using an email form from their profile. Company may post as many job positions as it needs. For each new job the company should add details that cover everything the student needs to know. The job listing is added to a feed and students may apply. The company cannot hire students who have not appliedfor the job. The company may only access the profile of the students who have applied for a job and hire them from there. It may also download the pdf version of the student's CV.

3.7 Non-functional requirements

A non-functional requirement is a requirement that specifies criteria that can be used to judge theoperation of a system, rather than specific behaviors [6]

3.7.1 Usability Requirements

This system is currently a website, which can be accessed by any smart device by entering the IP address of the server or the URL. The first screen that user can see is the login screen divided for university, company and student. The website is created to change its size according to the devicerequirements. This website is simple, eye-catching, practical and is not at all misleading. Each user, after logging in is directed in webpages related to their status, the website is dynamic and responsive. University is directed to the list of students entered in the system. Student accesses thejob feed immediately, while the company sees the feed of the jobs it has posted.

3.7.2 Performance Requirements

Since the system is a website, the amount of memory it consumes is very low. Also, objects that have a considerable size are very limited. Thus, is not a burden to the memory of the system. Timewise, database is not overloaded, so the queries do not take long to perform, so the website does not take long to load or perform duties.

3.7.3 Supportability Requirements

The system is supported on any device for as long as the device is smart and connected to the internet. By accessing it through a browser every user can benefit from what the system offers. Itadapts on every device graphically.

3.7.4 Security Requirements

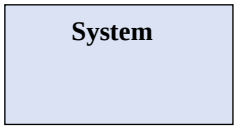
Each of the users may login with an identification number and password, which they may changein case they forget it. In case of a wrong password, an error message will be displayed. The registration process for the university and the students has a few requirements before happening, while the companies may create an account without restrictions. Universities need to be confirmedby the system manager before being part of it. Students need to be listed by universities before being able to create an account. After logging in, users can access certain pages depending on theprivileges that they are granted, but their access will be blocked on other pages and features. Theycannot edit the database or perform actions that may affect it negatively, because they may only edit certain pieces required by the system. The connection should happen through ‘https:’ which provides secure connection and also there shall be PHP code to secure the data and the users. Passwords should have conditions to be longer then 8 digits, with special characters, numbers andcapital letters and should be encrypted. Each input should be according to the requirements of thesystem or else will not be accepted. It is important not to show the user’s information inside the URL.

3.8 System design and modeling (UML)

3.8.1 Use Case Diagram

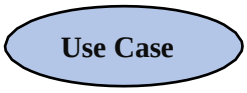
Use case diagrams specify what the system should do, what is expected from the system and not how the system should do anything. These diagrams are created from the end-user point of view. Use case diagrams are simple diagrams that do not go through details. They summarize the most important actions that any of the actors can do, not in a specific order, in only a few shapes and usecases.

The elements of the use case diagrams are only a few as mentioned:



System boundary is the entire system created and the environment whereeverything happens.

Actor is every user of the system, he/she is someone whointeracts with use cases and plays a role to the system.



Use Cases usually are actions in a bubble that shows the functionality ofthe system and what the actor can do.

The link connects the actors to the use cases.

Below is the general use case of the system. There are three actors inside one system which is named “Studentship”. The actors are the student, university represented by university representativeand the company. The actors have a few use cases in common. The first one is the ‘register’ use case. The other one is ‘login’ which extends to another use case, ‘wrong credentials’, this happenswhen during login, any of the actors mistakes the credentials to log in.

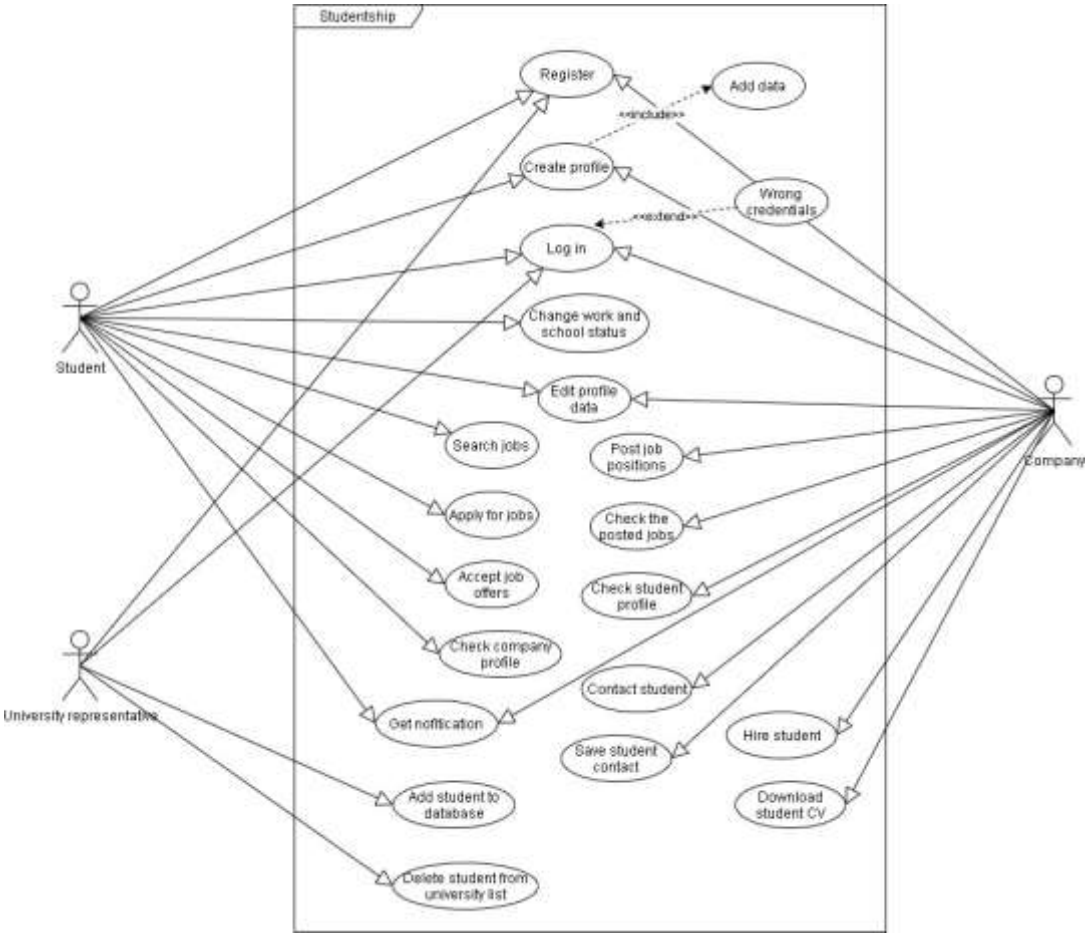


*Figure 5. 5.*Use Case Diagram

Student and company are connected to the same use cases repeatedly because the way their profileand account functions is the same. One of these use cases is ‘create profile’, and this process includes the other process of adding data for the company/student resume besides the personal data.Use case ‘create profile’ also includes the one ‘add data’ by the same logic. Both the actors can edittheir profile and get notifications.

University representative has only a short list of actions to perform and this is shown by the diagram.The job of the representative is to add students into the system and delete them when time comes. Inside the system, student can edit the status of education or employment. Student may search forjobs and apply for jobs. He/she may also check the profile of the company interested in and acceptjob offers.

Company, on the other hand, may post new job positions in the system. It may check the posted jobs and the student profile. Company may contact student by an email form that is located in the profile of the student. Each company may hire students and may download their resume by pressinga button in their profile. After a student is hired, the company saves the student contact as a networktool.

3.8.2 Activity diagram

Activity diagram represents the behavior of the system. It describes the way the activities are coordinated. Below is the general activity diagram of the system. When the user enters the website,the login page is shown. If the users are not registered, they have to go through the registration process. This process may happen at the same time for all the users. During the university registration process, university has to wait for approval from the system manager to register. If it isnot approved, it cannot continue into the system. Else, after the registration, university adds students, so they can register as well. After creating an account, student and company create their personalized profile. After finishing these steps, users can login into the system whenever they want. If the users are registered, each of them can login unconditionally.

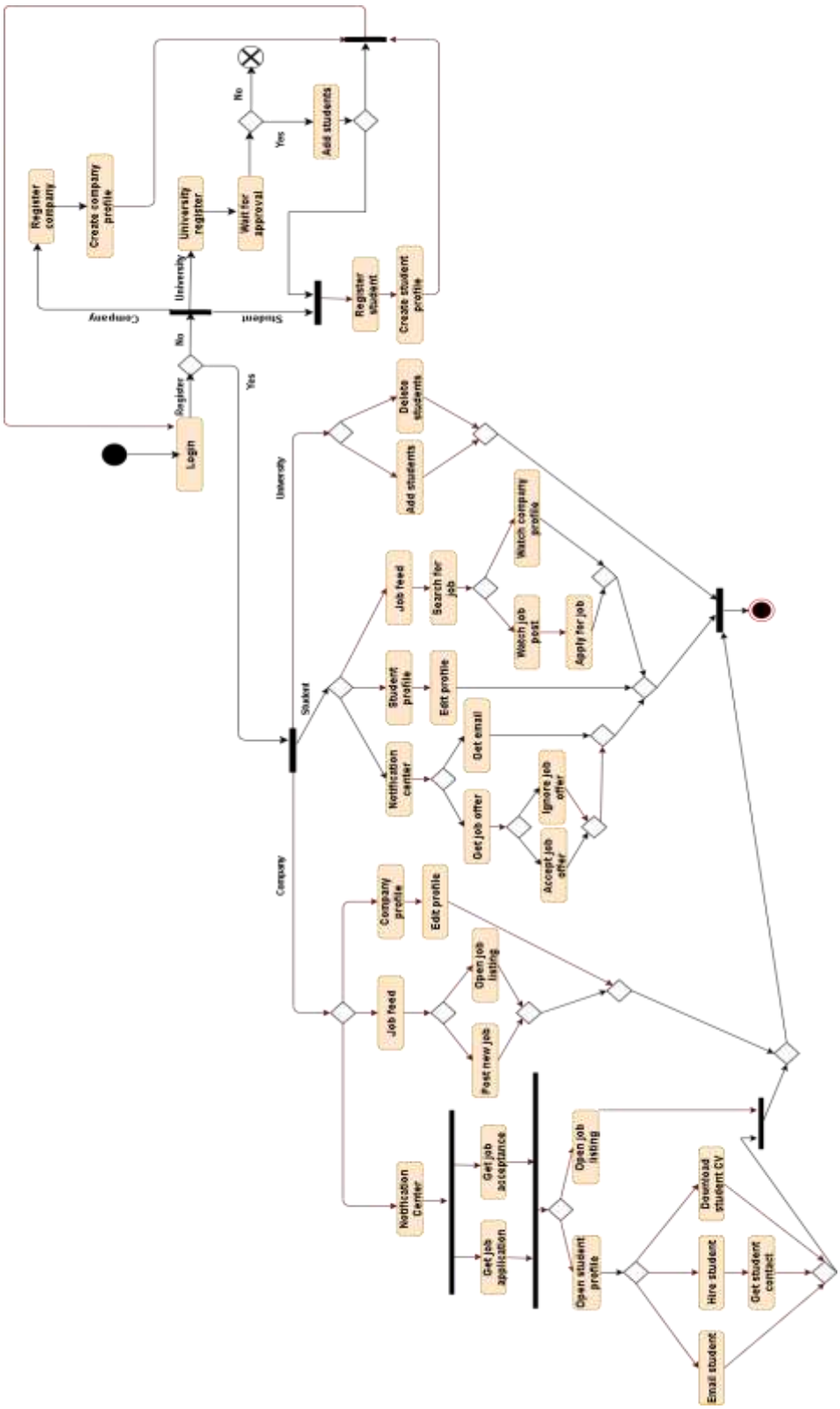


*Figure 5. 6.*Activity Diagram

When a company is logged in, the possible activities are:

- Accessing its profile
- Accessing the job feed
- Open notification center

When the company is directed to its profile, it has the possibility to edit it.
When company is directed to the job feed it has two choices, to create a new post about an internship position or go through the job listings posted before. If company chooses to check its notifications, there will be job applications and job acceptance notification. In each of these notifications, the company can visit the profile of the user, or can open the post that describes thejob. When student profile is accessed and the company takes actions in it, it can either send the student an email, download the resume of the student or can hire him/her directly and save the contact of the student.
When student is logged in into the system, the possible activities are the same as the company:

- Open the profile page of the student
- Navigate job feed
- Open notification center

When student opens the profile page, he/she can edit any of the data there.

When student is directed to the job feed, he/she may search for a specific job or company, or keyword. After the jobs are listed, the student can either open one of the jobs and apply to it if it is convenient for him/her, or may just visit the company profile. Notification center of the student works the same way as the one the company has. The types of notifications that student gets are either an email from a company, or a job offer which can be accepted or ignored.
After logging in, the only two choices of the university are to add or to delete students.

3.9 ER Diagram

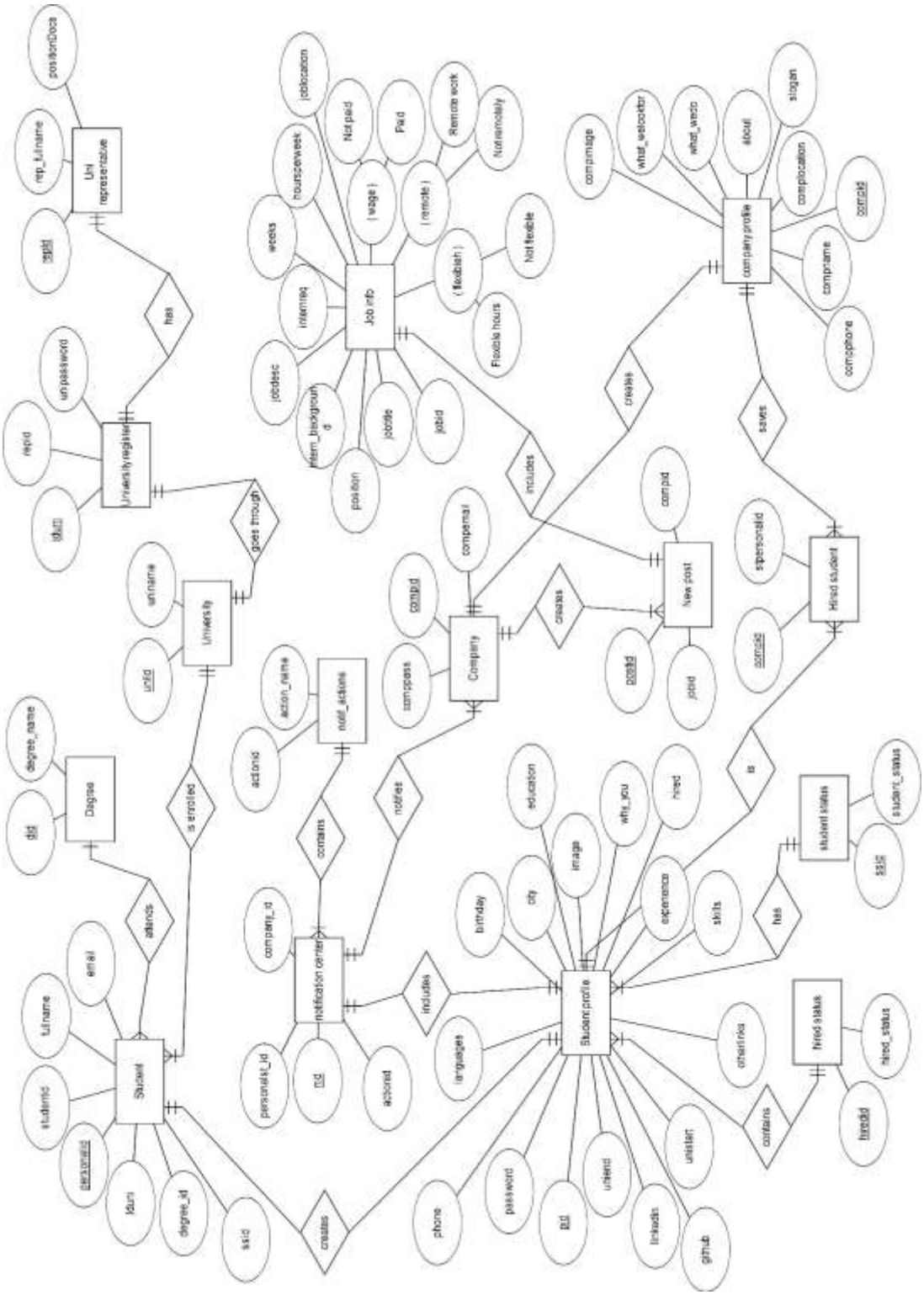


Figure 5. 7.ER Diagram

Above is included the Entity Relationship Diagram for the database of the ‘Student Professional Practice Market – Studentship’.

3.10 Sequential Diagram

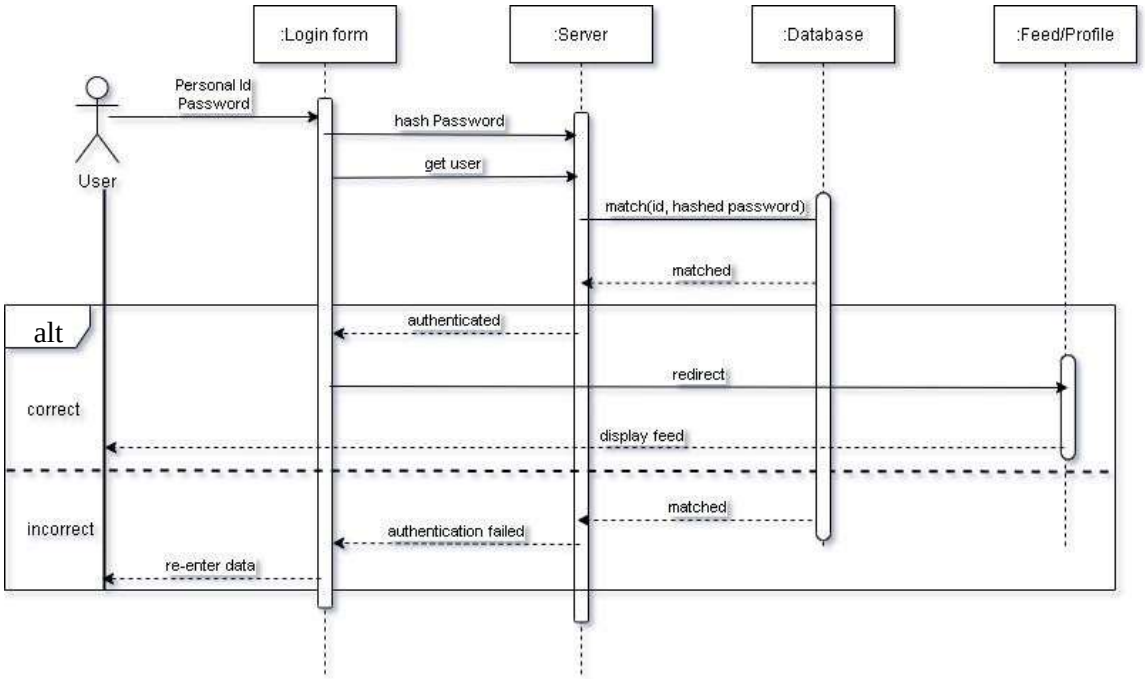


*Figure 5. 8.*Sequence Diagram

Above is the sequence diagram of the user authentication. Sequence diagrams show in details howthe operations occur. Everything is shown in the order that these processes happen. Related to thecomponents that make the diagram a whole, the horizontal lines show the elements involved in thewhole process. Their order is also set according to the actions of the user and system. The verticalaxis represents the progress of time, but not in the sense of duration.

Actor is the external entity that interacts with the system and uses it. The vertical line is called lifeline and it represents each single entity in the interaction while the white rectangle represents the period in which the interactions are happening.

Horizontal solid lines represent the communication between entities, while the dashed lines represent the response that each entity is sending back.

The frame with two parts with the fragmented operator is called a fragment and it only executes one of the alternatives, in this case, when the credentials are right and the user is authenticated. Otherwise, it sends back responses which ask the user to enter its data again.

4. IMPLEMENTATION

4.1 Database

When I started creating this system, I had many doubts about the programming languages to be used, but I never had doubts about the database. This system, more than everything is a CRUD platform and the main role in such system is played by the database. I have used MySql as a database platform for many reasons. It is easy to connect, it can be accessed everywhere, it is flexible, is well known to the programmers community and it is the most secure database.

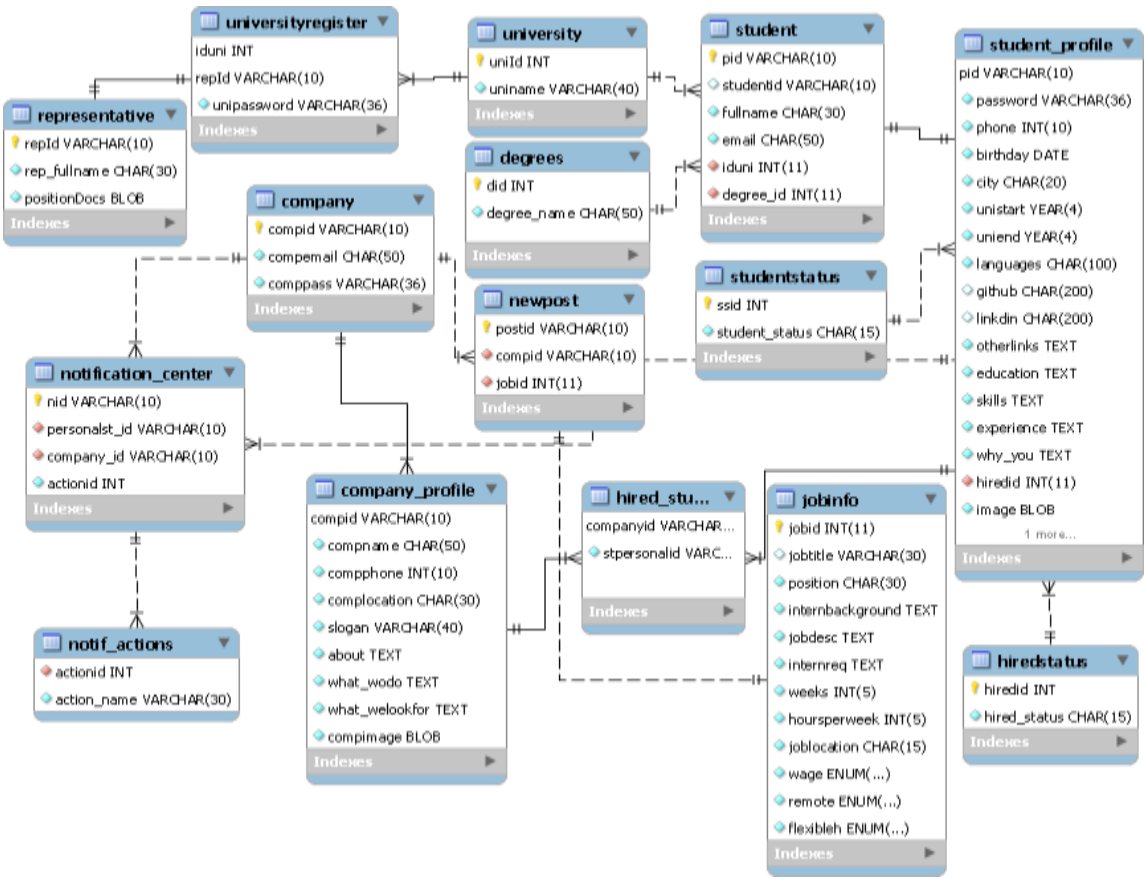


*Figure 5. 9.*Relational Schema

This is the relational schema to my database. The database contains 14 tables. Everything startsfrom university. ‘university’ table contains an auto-incremented primary key and the name of the university. The table is populated with the list of universities in Albania. This way it will be easier for the user using the system and entering data.

```
Insert into university(uniname) values("Universiteti i Tiranes");
Insert into university(uniname) values("Universiteti Politeknik i Tiranës");
Insert into university(uniname) values("Universiteti Bujqësor i Tiranës");
Insert into university(uniname) values('Universiteti i Elbasanit "Aleksandër Xhuvani"');
Insert into university(uniname) values('Universiteti "Luigj Gurakuqi", Shkodër');
Insert into university(uniname) values('Universiteti "Eqrem Çabej", Gjirokastër');
Insert into university(uniname) values('Universiteti "Fan S. Noli", Korçë');
Insert into university(uniname) values('Universiteti "Ismail Qemali", Vlorë');
Insert into university(uniname) values('Universiteti "Aleksandër Moisiu", Durrës');
Insert into university(uniname) values('Universiteti i Arteve');
Insert into university(uniname) values('Universiteti i Sporteve të Tiranës');
```

Code 1 – Database insert

‘university_register’ will be the table used for the authentication of the university. Universitieswill login with the identification number of their representative and the chosen password. ‘representative’ table will contain the needed information about the representative of the university, which will be one for each of them. To be added as a representative of an universityin the system, the identification number of this person is necessary and obligatory, because it will function as a primary number for this table and also as one of the university login credentials. This table also contain the full name of this employee in charge and a scanned document that proves that this person works in that university and has the rights to perform inthe system. ‘university’ table is connected to the student. Each university has many students. This tables includes main data for the student and this is the table that will be used by universityto add students to the system. It includes student identification number, full name, email, university and degree. The degree of the student is a foreign key from the ‘degrees’ table, which includes the auto-increment integer as primary key and the name of the degree.

```
Insert into university(uniname) values("Universiteti i Tiranes");
Insert into university(uniname) values("Universiteti Politeknik i Tiranës");
Insert into university(uniname) values("Universiteti Bujqësor i Tiranës");
Insert into university(uniname) values('Universiteti i Elbasanit "Aleksandër Xhuvani"');
Insert into university(uniname) values('Universiteti "Luigj Gurakuqi", Shkodër');
Insert into university(uniname) values('Universiteti "Eqrem Çabej", Gjirokastër');
Insert into university(uniname) values('Universiteti "Fan S. Noli", Korçë');
Insert into university(uniname) values('Universiteti "Ismail Qemali", Vlorë');
Insert into university(uniname) values('Universiteti "Aleksandër Moisiu", Durrës');
Insert into university(uniname) values('Universiteti i Arteve');
Insert into university(uniname) values('Universiteti i Sporteve të Tiranës');
Insert into university(uniname) values('Universiteti i Mjekësisë, Tiranë');
Insert into university(uniname) values("Universiteti i New York-ut në Tiranë");
Insert into university(uniname) values('Universiteti Privat "Albanian University"');
```

Code 2 – Database insert

Student is also connected to the ‘student_profile’ table. Each registered student has automatically one profile, not more than one. This table contains all the data about the profile of the student and its CV, such as education, job experience, skills, etc, but also personal datalike birthday, phone number, password, student status and hired status. ‘studentstatus’ is connected to student profile and has two values, student and alumni and a primary key whichis an auto-incremented number.

Code 3 – Database insert

```
Insert into `studentstatus`(student_status) value("Student");
Insert into `studentstatus`(student_status) value("Alumnus");
```

‘hiredstatus’ as well is a table connected to the student profile which has the same format of primary key as the previous table, and the status of employment of the student which shall havethe values ‘employed’ and ‘Not employed’.

```
Insert into `hiredstatus`(hired_status) value("Employed");
Insert into `hiredstatus`(hired_status) value("Not employed");
```

Code 4 – Database insert

Another important table is ‘company’ table. This table is used for the identification of the company and its attributes are the identification number of the company, its email and the password. ‘company’ table is connected to the company profile which has the same philosophyas the ‘student_profile’ table. ‘company’ is connected to ‘new_post’ table that is directly connected to ‘job_info’. This last table contains all the data entered by a company when makinga new post about a job such as intern requirements, work days, student background, etc.

After students do not work for the company anymore, there needed to be a way so the companydid not lose contact with the student. That is why the table hired students contains the identification number of the company and of the student, each of the hired students will be stored on the table and will be listed for the company.

Both student and company get notifications about their interaction with each other. That is whythey are both connected to a table named ‘notification_center’. This table has a primary key which is the identification number of the notification and foreign keys of the company that is part of the notification and the student that sends or receives it. Also, it contains the id of the action that the notification is about, which is connected to the last table, ‘notif_actions’ whichshows what the action is named and what the notification is for.

5. CONCLUSION

I think this work is going to helpful mostly to students and they will find it as a solution whenever needed, especially when they need to gain work experience for future jobs. Since in Albania and not only, the market does not seem like is going to change or like it is going to be more acceptingtowards students or just graduates, they need a bridge to make the connections. Until now that bridge did not exist because there is nothing created solely for students.

High education institutions must take over such systems and manage them in order to have a morespecialized and skilled youth, that put their diplomas to work. The indifferent ways of giving an order to make professional practices obligatory but not giving a solution to providing them to thestudents is not how something is done at the peak of technology when the solution to every problemis online and everyone is gathered virtually.

This system that requires minimal managing effort would be the best solution to all the parts included because it is a simple way to get things done with endless opportunities in front of the user's eyes.

By not being sure what they want to do in the future and the limited possibilities that students have,being somewhere where every listed job is possible and they can choose based on what they can and want to do, this system pushes students to less career choice mistakes. For me, a student myself, this is really important because I would not like my effort and passion to go to waste.

For future work I would like to keep making the web-based system more functional and more including, by adding innovative solutions and a wide variety of all the different programs such astrainings, jobs, certifications, workshops and real long - lasting jobs only available to students.

To sum up, works like this make me think that in the future it will not be as difficult to get a jobthat you like, that you can do or that you want to learn to do, aside from studying and education.

After the web system, next will be a mobile app, more user friendly and easier accessible by everyuser.

REFERENCES

E. Gashi, "POST-DIPLOMIMI DHE TRANZICIONI NË TREGUN E PUNËS," Leadership and Growth Council, MAY 2016. [Online]. Available: http://lgc-ks.org/images/uploads/files/Post_diplomimi_dhe_tranzisioni_ne_Tregun_e_Punes.pdf.

E. K. Alba Çela, "RINIA SHQIPTARE 2018/2019," FONDACIONI “FRIEDRICH EBERT”, 2018/2019.

S. R. G. Fernandes, "Preparing Graduates for Professional Practice: Findings from a Case Study of Project-based Learning (PBL)," 2014.

I. Global., "IGI Global. Computer Systems and Software Engineering: Concepts, Methodologies, Tools and Applications. 2018.," 2018.

Guru99, "Guru99," 2021. [Online]. Available: https://www.guru99.com/functional-requirement- specification-example.html.

"Non-functional requirement," Wikipedia, July 2021. [Online]. Available: https://en.wikipedia.org/wiki/Non-functional_requirement.

F. “. EBERT", "https://portavendore.al/wp-content/uploads/2020/07/RINIA-SHQIPTARE-2018- 2019-FONDACIONI-%E2%80%9CFRIEDRICH-EBERT%E2%80%9D_compressed.pdf," [Online].

IGI Global. Computer Systems and Software Engineering: Concepts, Methodologies, Tools and Applications. 2018.

Nace.Principles for Professional Practice for Career Services & EmploymentProfessionals.www.bu.edu/careers/files/2012/12/Principles-for-Professional-Practice- PDF.pdf.

M. Zaharie, “How could we improve the university graduates transition from education to labor market in Balkan States,” 13th Intenational Summer School of Cervia, 2007.

Terolli, Erisa. ANAYLSIS, DESIGN and IMPLEMENTATION of a CAREER OFFICE INFORMATION SYSTEM. 2013, inf-proj.epoka.edu.al/projects/thesis/Erisa_Terolli.pdf.

D. W. Scott and H. F. Walter, “Managing A Student Internship: Auditors Looking to Hire Temporary Help May Want to Consider Their Local College or University as a Source ofPotential Candidates”.

APPENDIX

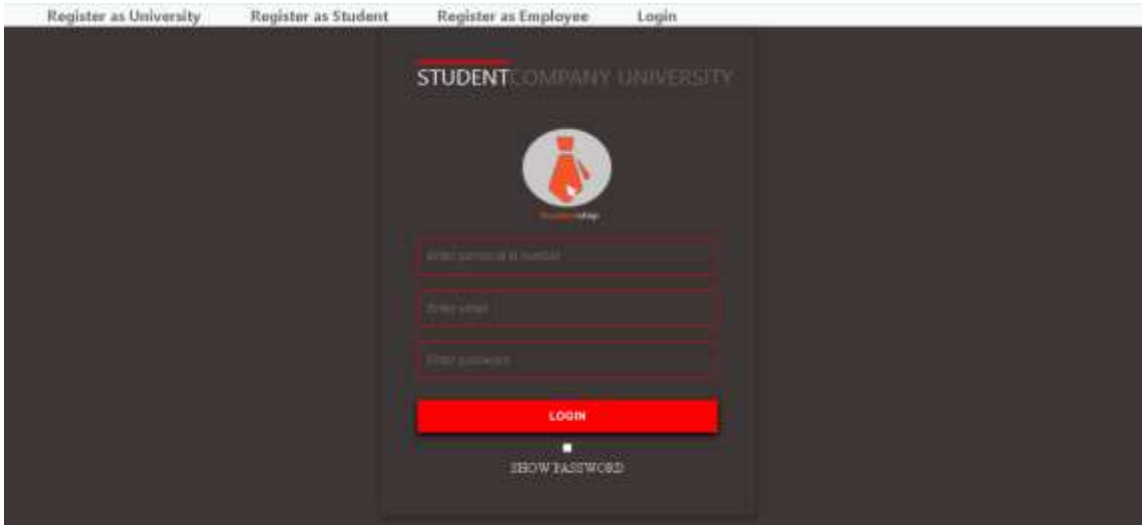


Figure. 1 Login page

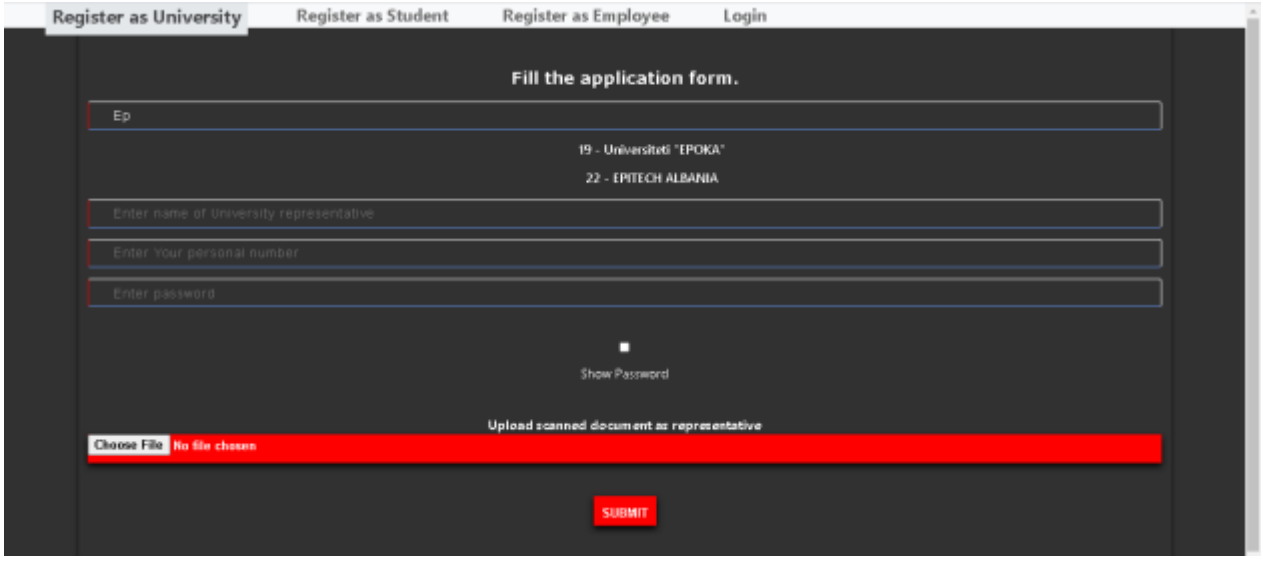


*Figure. 2.*University register page

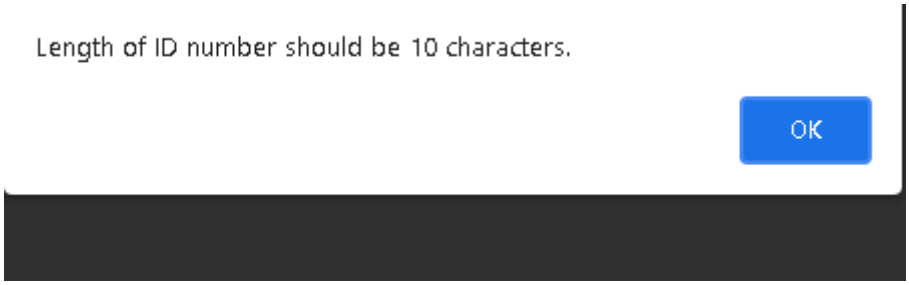


*Figure. 3.*Input constraints for passwords and Id

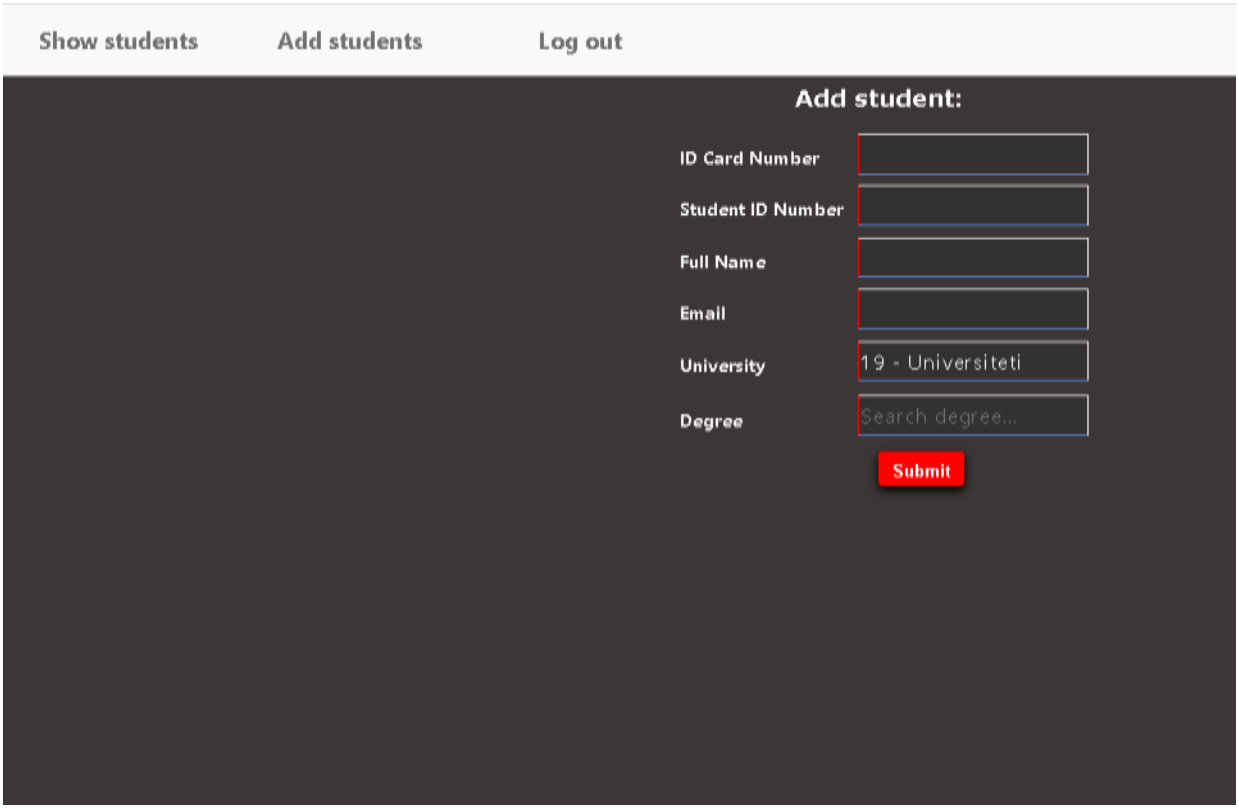


*Figure. 4.*University page to add students to the system

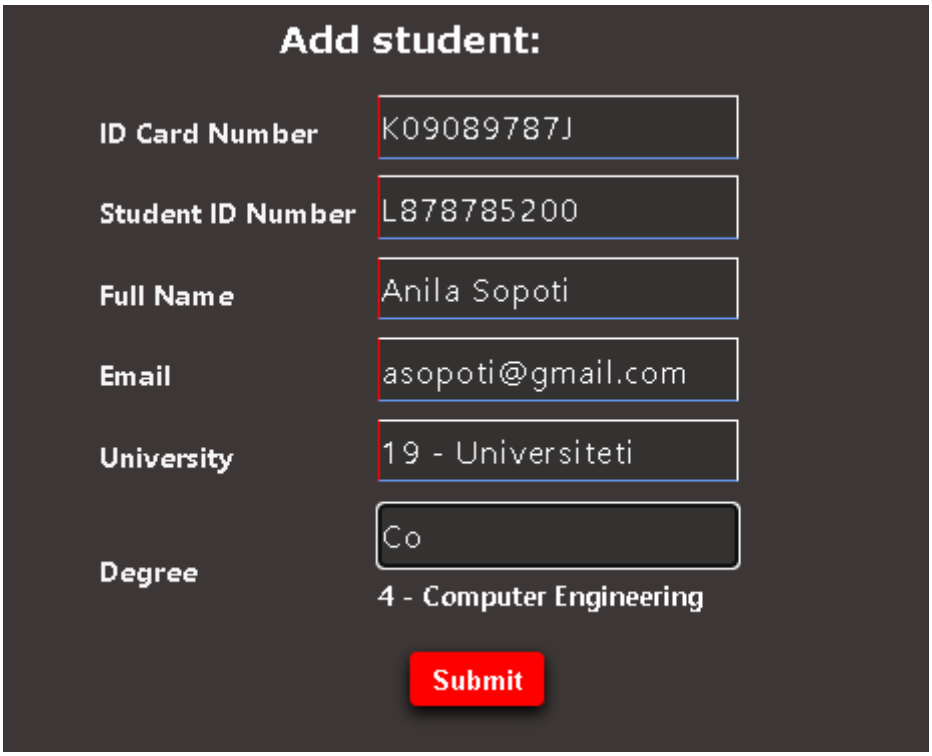


Figure. 5.Add student page

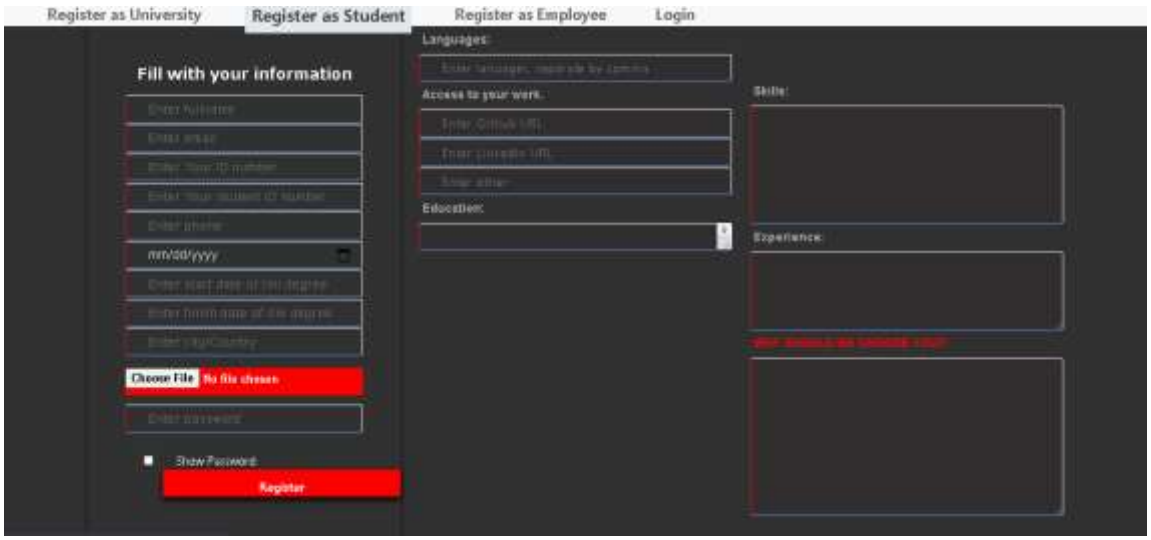


*Figure. 6.*Student register

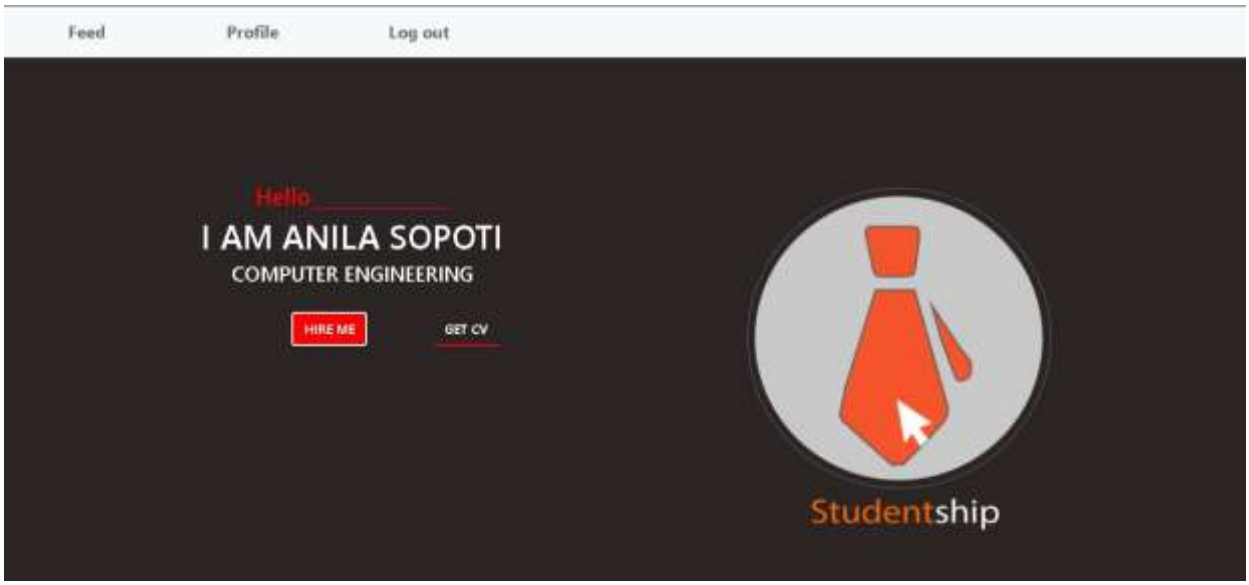


*Figure. 7.*Student profile

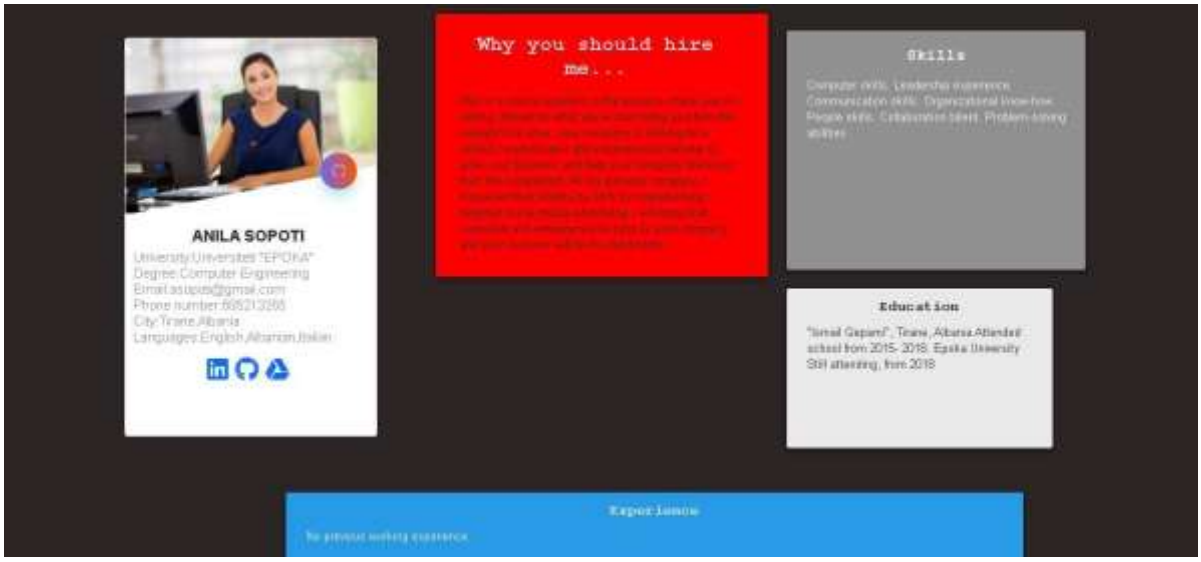


Figure. 8.Student profile

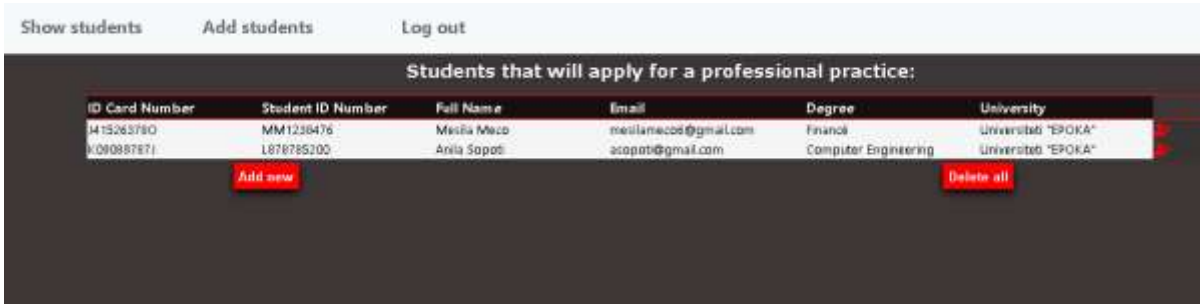


*Figure. 9.*University "Show students" page

When university deletes students their status changes automatically from student to alumni buttheir profile stays active.

*Figure. 10.*Company register

Figure. 11.Company profile

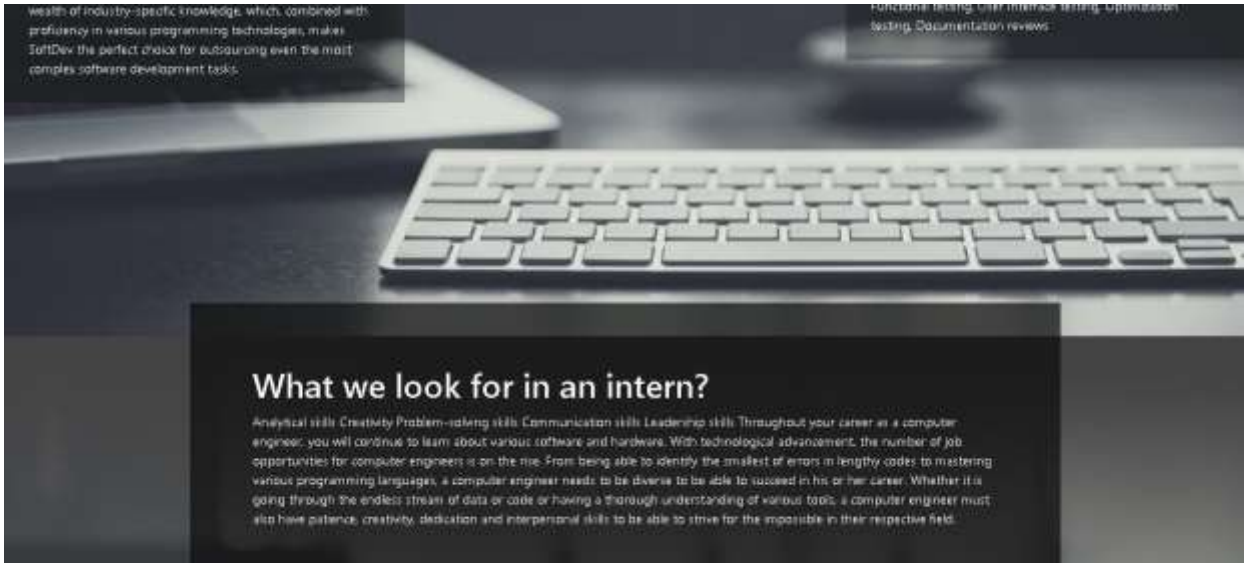


*Figure. 12.*Company profile

Figure. 13. Company feed

*Figure. 14.*Post Job

*Figure. 15.*Student feed

*Figure. 16.*Student search and apply

*Figure. 17.*Company feed and notifications

*Figure. 18.*Company hiring student and student accepting it

Process of company hiring student, student gets notification and accepts the job.

Student accepts position by emailin the company, company emails student by a button in student'sprofile

*Figure. 19.*Contact form