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COMPUTER ENGINEERING DEPARTMENT

CENG 407 - Innovative System Design and Development I

PROJECT REPORT

**INTELLIGENT NON – GOVERNMENTAL ORGANIZATION MANAGEMENT
SYSTEM / (I-NGOS)**

BY

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Abstract:

Non-Governmental Organizations (NGOs) are non-profit and volunteer-based groups organized at different levels such as local, national or international serving in era of social development, human rights, education, health and environment. Although they share certain qualities with government and private sector organizations, NGOs have certain organizational characteristics. They manage relationships with various actors, carry out different projects and face special challenges. At this point, NGO management differs from business management and public sector management, and is complex in the design and implementation of such systems. This project aims to facilitate the management process of education-based NGOs through the Intelligent NGOs Management System (I-NGOS), to relax the management system and to ensure that all processes are carried out through this software. Its mission is to develop I-NGOS at different platforms such Web, Android and iOS for İLKÝAR, which is a NGO serving in education era in Turkey. The most important criterion that differentiates this project from its counterparts is that it aims to ensure that all processes of the organization are carried out in a digital environment with a single program.

Keywords:

Non-Governmental Organization, Intelligent NGOs Management System, İLKÝAR, Web, Android, iOS

Özet:

Sivil Toplum Kuruluşları (STK'lar), sosyal kalkınma, insan hakları, eğitim, sağlık ve çevre gibi farklı düzeylerde yerel, ulusal veya uluslararası alanda organize edilen, kâr amacı gütmeyen ve gönüllülük temelli gruplardır. Devlet ve özel sektör kuruluşlarıyla bazı nitelikleri paylaşmalarına rağmen, STK'ların belirli örgütsel özellikleri bulunmaktadır. Çeşitli aktörlerle ilişkileri yönetir, farklı projeler yürütür ve özel zorluklarla karşılaşırlar. Bu noktada, STK yönetimi iş yönetimi ve kamu sektörü yönetiminden farklıdır ve bu tür sistemlerin tasarımları ve uygulanması açısından karmaşıktır. Bu proje, eğitim temelli STK'ların yönetim sürecini, Akıllı Sivil Toplum Kuruluşları Yönetim Sistemi aracılığıyla kolaylaştırmayı, yönetim sistemini rahatlatmayı ve tüm süreçlerini bu yazılım aracılığıyla yürütütmelerini sağlamayı amaçlamaktadır. Türkiye'de eğitim alanında hizmet veren bir STK olan İLKÝAR için Akıllı STK yönetim sistemini; Web, Android ve iOS platformlarında geliştirmeyi misyon edinmiştir. Bu projeyi benzerlerinden ayıran en önemli ölçüt kuruluşun tüm süreçlerinin dijital ortamda yürütülmesini tek bir programla sağlamayı hedeflemesidir.

Anahtar Kelimeler:

Sivil Toplum Kuruluşu, Akıllı Sivil Toplum Kuruluşları Yönetim Sistemi, İLKÝAR, Web, Android, iOS

1. INTRODUCTION

1.1. Company Information

İLKYAR (İlköğretim Okullarına Yardım Vakfı) was founded at EFES (Educational Funds for Elementary Schools) which is under the auspices of Turkish Student Association at Princeton University in USA in 1978. Then, İLKÝAR was established in Turkey in 1998. İLKÝAR manages several types of projects to assist elementary students in villages of east of Turkey such as Science Bus Activities, Summer School Project, Special Days Project, Book Posting Project, Student Support Fund and etc. It provides scholarships, sends materials on special days, invites some successful students to Ankara and manages some events, etc. İLKÝAR aims to develop childrens' imagination, self-confidence, and talents. Also, İLKÝAR provides students and teachers learning and thinking ability using the cause-effect relationship. All İLKÝAR studies are carried out on a voluntary basis. İLKÝAR maintains its functions in ODTÜ campus.

1.2. Motivation

As being the project team, we are interested in social assistance projects, hence we choose this project because of this reason. Besides, the I-NGOS project needs to develop in three different platforms which are Web, Android and iOS. It would provide us learning new techniques and platform developing methods. Also, by integrating whole management functions all together a beneficial application will be developed for non-governmental organizations in education era. Hence the organizations could obtain time efficiency and performance quality by using this application. While developing the projects Android and iOS part, it is planned to use a cross platform Xamarin which will be beneficial for us. Thus, in Web part developing ASP.NET framework will assist us to develop the project easily and professionally.

1.3. Problem Statement

Almost the majority of the non-governmental organizations suffers from inavailability of one unique application that collects all management, financial, and other functional tools together. The organizations use several types of tools, applications however they lose integrity and completeness of their functions. Sometimes, they may not access the necessary information or data at the exact time. Furthermore, some operations could not be handled such as donation processes. Since each personnel works as a volunteer, the term "time" and "efficiency" are the most vital two terms that need to be considered. If these non-governmental organizations accomplish their tasks with high efficiency and less time, they might partition their other tasks effectively. Especially, the organizations that perform projects in education era are the most essential one that requires time and well-divided capacity. As a pilot non-governmental organization in education era İLKÝAR is decided to work with. İLKÝAR maintains several types of projects for elementary level students at east villages of Turkey who has

lowest income families. By arranging events or sending posts to schools, they perform huge tasks. Also, they invite successfull students to Ankara and arrange some events. Each project has different requirements and these requirements' records need to keep at somewhere. Some tools and packet programs are used actually; however, they are inefficient to handle all these issues. Also, they might not access the related information. For instance, the donation procedure is handled with hard copy documentation. The donator must go to bank or send the donation to specified IBAN and then the documents are kept on files at İLKÝAR center. The responsible person arranges and edits the donation specifications, whom to it will be given and so on. In today's technological environment, these old processes seem a little bit unuseful; so, online purchasing system is provided to the donators and shcolarship holders to follow their operations online by using bank APIs. Therefore, with the help of intelligent technique usage some important warnings will be made in the application to remind the user specific topics.

Another problem among these organizations, there is no application that collects all three platforms which are Web, Android and iOS all together for education based non-governmental organizations all around the world. I-NGOS project would be the first one when it is completed which creates a huge advantage to us.

1.4. Related Work

NGOs, which innovate with digital strategies, are given in details at Literature Review section. One of the important cases is about paper-to-digital conversion of Compassion International, which is a child-advocacy ministry, which offers education, health, social and spiritual services to 1.8 million children over 25 countries. Compassion is a leader in holistic offspring development through sponsorship. Studies in the Journal of Political Economy [58] indicated that 50-80% of kids sponsored by compassion-sponsorship accomplished their university education compared to non-sponsored children. After heavy investments in digital technology, Compassion adopted a transformational digital strategy over 800 different IT systems in the United States and more than 20 countries [57]. Today, Compassion increases the quality of the impact it creates on existing beneficiaries, not only to serve more children, but also as evidenced by the digital technology's annual growth rate of 7% per annum [58].

The digital transformation of Compassion has resulted faster connections between children and sponsors [57]. Before the transformation, it was taking a few months to identify a child in need, sign up to organization and to link them to a sponsor. Furthermore, the organization is expecting to decrease over 300,000 hours per year by moving existing paper forms used to a digital platform offered through cloud platform and mobile devices [44]. In addition, by

reducing the time required for a kid to connect with their donors from six months to several weeks made the correspondence faster [44].

The potential benefits of using İLKÝAR's Intelligent NGO Management System are as follows:

- Donors, employees, people in need and the organization expects the level of experience and transparency from the organization to win their trusts.
- I-NGOS prevents other donors to choose other NGOs, since many NGOs compete for the same pool of resources, qualified volunteers and donors.
- Paperwork is eliminated and all processes are available to users at any time in a digital environment.
- No need to use more than one package program, all processes are executed through a single program.

1.5. Solution Statement

İLKÝAR does not have any presence on Android or iOS platforms, and the Web platform is lacking some functions that help with system management compared to many NGOs serving in the field of education. The characteristics of the NGO Management System to be developed for İLKÝAR were determined by the comparisons with other NGOs. Details of these comparisons is given in Literature Review section. İLKÝAR aims to manage the processes with a system that can be used on Web, Android and iOS platforms where it can control interaction with actors, communicate, make project planning and create project schedule.

It is planned to complete the I-NGO Management System as a system using cloud technology and server-client architecture. Aim is to design for use on Web, Android and iOS platforms. Different functions have been determined and different interfaces have been designed according to NGO needs and system actors. There are ten types of participant, who are supposed to interact with I-NGO management system. Functional requirements identified according to these participants. For instance, the system controls volunteer membership (join/leave), participation request for a particular project, approval of participation, project details and schedule, etc. Each of several client roles needs different interfaces. These interfaces are designed according to different platforms. Designs are given in Software Specifications section. The system is expected to learn from every project to become more

intelligent in providing feedback in organizing future projects and controlling the participation for both volunteers and target organization (school or others).

2. LITERATURE REVIEW

A Review of General Concept of Non-Governmental Organizations' Management Systems in Education Era in Terms of Digitalization

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Abstract

In this study, literature is reviewed to constitute a background for the project named intelligent non-governmental organization management (I-NGO) system. For this purpose, general information about NGOs are studied. Definition, classification and some NGOs with their serving area, well-known NGOs in education with their projects and aims are investigated in detail. Moreover, under the title of psychological considerations, how social activities affect student's academic performance and motivation in low-income families is presented. Finally, topics which are digitalization, its connection with technology and how important digitalization is and why an NGO should be digitalized are studied in this sense. Besides, giving digitized NGO examples in the world with numerical statistics of their increased success, literature review is completed. Based on our results and findings, conclusions such that NGOs are active on different fields, well known NGOs in education have several projects for parents, students and children, projects for students influence student's motivation and performance in a good way in low-income families by supporting them, these NGOs have website and application on iOS or Android or both with several options such as shopping, volunteer registration, online entrance and etc., and also digitalization which is common word in today's world have importance for accessing much more people in need with those websites and applications and it is a necessity to make innovations for the processes that NGOs perform are drawn.

2.1. INTRODUCTION

A serious number of researches of Non-Governmental Organizations (NGOs) in the enhancing world has been published and have been caused to a distinctive literature within the social science since the late 1980s [57].

These non-governmental organizations are divided into several types such as health based, social based, educational based, environment based etc. [8,9]; however, during this I-NGOS Project it is considered in terms of education based non-governmental organizations. Also some topics are examined in details such as the importance and efficiency of these organizations', how these organizations affect the students' academic success, whether there is any evidence that these social assistances have an effect on motivation of students or not, how digitalization could be used in the project to enhance the organization ILKYAR and is there any sample applications or projects that previously done before to take them as an example during our project. From perspective of ILKYAR, it plans and schedule their route by maximizing number of reached schools and minimizing the costs and time in addition to these goals.

From psychological perspective, the impact of social assistances by non-governmental organizations on students' academic life is the major issue. The students in low-income families get difficulties while going to school and pursuing academic success. Since their families might not provide sufficient financial support. So, by helping these kind of students their academic success could be enhanced and their motivation to school could be kept high. Also, the importance of non-governmental organizations' social assistance is another issue that affect the project objectives.

To provide a balance and integration between volunteers and the organization management some digitalization steps are followed. Thus, thanks to digitalization the activities in the organization are speeded up.

Finally, by investigating some sample non-governmental organizations' applications, the projects' details are defined and some missing parts are specified. Additionally, due to the shortage of these type of applications the project details are figured out carefully. Some similar organizations such as **OxFam, CARE, Ford and Rockefeller Foundations, AÇEV, TEV, İLKÝAR, Çağdaş Yaşamı Destekleme Derneği (ÇYDD), MEV, TED, ÇEV** etc. are evaluated and investigated.

2.2. BRIEF DESCRIPTION ABOUT NGOS

2.2.1. What is an NGO?

To be more effective in various interests and benefits, there is a need of solidarity between individuals, communities in public and the other individuals [1]. This need makes people come together in non-governmental organizations (NGOs). Issues, necessities and requests are put across via NGOs.

According to the World Bank's definition in 1992 [2], NGOs are "many groups and institutions that are entirely or largely independent of government and that have primarily humanitarian or cooperative rather than commercial objectives." On the other side, in 1998 Clarke [3] stated that NGOs are "private, non-profit, professional organizations, with a distinctive legal character, concerned with public welfare goals."

NGOs' typical characteristics are that they do not only give service for their goals and values, they are independent from governments, political parties, public authorities and not profit motive organizations and they are intermediary between central authority and citizens [4,5].

Different denominations of NGOs that includes various foundations, units, groups etc. strengthen the definition of concept [6]. Common denominations are as follows non-profit organizations, non-profit sector, and voluntary organizations, not profit for organizations, civil society organizations, non-governmental organizations-NGO, independent sector, charitable organizations, tax-exempt organizations [7].

2.2.2. Classification of NGOs

In broader term, NGOs can be divided into three categories as activity-centered NGOs which make activity on sport, culture, recreation fields, society-centered NGOs such as political parties, environmental organizations, welfare-centered NGOs such as social service, health, education [8, 9].

Table 1 is constructed based on Working Papers of the Johns Hopkins Comparative Nonprofit Sector Project's international classification of non-profit organizations, major groups and subgroups [10].

According to this table, while group 1 can be taken as activity-centered, group 5, 6, 7, 9, 11 can be taken as society-centered and group 2, 3, 4, 8, 10 can be taken as welfare-centered NGOs.

Table 1 The International Classification of Nonprofit Organizations, Major Groups and Subgroups

GROUP 1	Culture and Recreation	Culture and Arts
		Sports
		Social Clubs
GROUP 2	Education and Research	Primary and Secondary Education
		Higher Education

		Research
GROUP 3	Health	Hospitals and Rehabilitation
		Nursing Homes
		Mental Health and Crisis Intervention
GROUP 4	Social Services	Social Services
		Emergency and Relief
		Income Support and Maintenance
GROUP 5	Environment	Environment
		Animal Protection
GROUP 6	Development and Housing	Economic, Social and Community Development
		Housing
		Employment and Training
GROUP 7	Law, Advocacy and Politics	Civic and Advocacy Organizations
		Law and Legal Services
		Political Organizations
GROUP 8	Philanthropic Intermediaries and Voluntarism Promotion	
GROUP 9	International	
GROUP 10	Religion	
GROUP 11	Business and Professional Associations, Unions	

Besides, in Working Papers of the Johns Hopkins Comparative Nonprofit Sector Project to exemplify this classification with an NGO example, OXFAM is said to be international in UK whereas it is classified under Group 4, 5 and 6 due to its activities in Peru [10].

Table 2 Categorization of NGOs

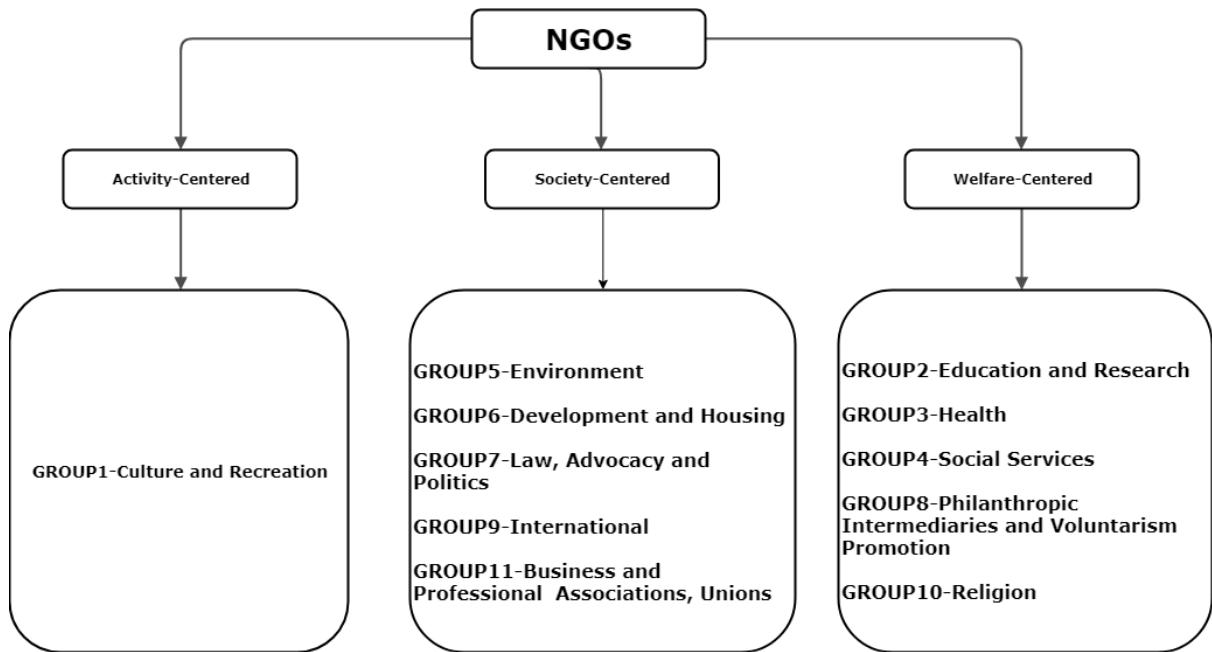


Table 2 shows NGO categorization based on Working Papers of the Johns Hopkins.

2.2.3. NGO Examples Around The World

In Global Journal Magazine's January & February 2013 release, BRAC, Wikimedia Foundation, Acumen Fund, Danish Refugee Council, Partners in Health, Ceres, Care International, Room to Read, RARE, CHAI and more others are included in top 100 NGOs [11]. Wikimedia Foundation [12] and Room to Read [13] are education based NGOs. BRAC [14] and Acumen Fund [15] are development based NGOs. Danish Refugee Council [16] and Care International [17] are humanitarian based NGOs. Ceres [18] and RARE [19] are environment based NGOs. Lastly, Partners in Health [20] and CHAI [21] are health based NGOs [11].

Most of the NGOs specify their mission as designing projects towards to society's education problem and organizing campaigns by referring education concept [22].

Focus of several programs are forming education infrastructure [23]. For instance, Mission International Rescue (MIR) try to make the Dominican Republic's education infrastructure for middle and high school students and built 2 schools [23].

Besides, enhancing the teachers' and parents' effect in education is a concern for NGOs. AÇEV in Turkey have programs to build capacity of parents and teachers for children in preschool [23]. Also, World Education(WE) in Guinea have projects for education such as program named Community

Action for Education and Literacy Project (ACEB) aims children ,who will not have any education otherwise, to have basic education [23].

In Turkey, TEV gives scholarship to students who are successful and need money, builds dormitories, schools, education centers and libraries to support education system, gives rewards with the aim of encouraging students' study and make academic researches about educational subjects [23].

Save the Children, which is a national organization, aims children especially most deprived ones to access quality education and has programs to cope with barrier of children's learning. With such goals, organization has three programs. Start Early which sets target as improving child development outcomes by working with their families and some communities, Foundational Learning which aims to make education quality stronger so that children can learn to read, write and use numbers in their early grades, Uninterrupted Learning which aims every children to keep learning even if there is crisis such as poverty, emergency and etc. Under the aim of this three programs, organization has education programs for children named as Early Childhood Development, Global Education Research, Girls Education, Literacy Boost, Numeracy Boost and School Health and Nutrition [24].

2.2.4. NGO Examples in Education Era

Based on statistics in 2009, there are 2387 active education associations in Turkey. Given number is increasing and thousands of associations take education field as center of their concern [22].

AÇEV, CYDD, ÇEV, TEV, TED, İLKÝAR, Compassion, WE, MEV are some of the most well known NGOs that are active on education field.

Anne Çocuk Eğitim Vakfı (AÇEV) ,which was found in 1993 by Ayşen ÖZYEĞİN in Turkey, is a national organization that aims developing and applying scientific based educational programs for parents, young women and children in need around the country. For kids' early age development, educational programs to parents are arranged by organization. AÇEV offers programs for parents such as Mother Support, Father Support program and for children mother-child education, child education, summer preschool program. Besides, a mobile application called **İlk6Yıl** is developed parents to access information about child development and parenthood talent.

This application is aimed to become a kid-growing guide. Based on AÇEV's 2017 activity report application is used by 366.594 people (Anne Çocuk Eğitim Vakfı, 2017). Also, acevdeokuyaz.org website which is developed to increase more people's literacy talent has more than 16.000 registered user. Now, AÇEV is a growing NGO day by day with 1.000.000 participants and 12.500 volunteer educators [25,26].

Çağdaş Yaşamı Destekleme Derneği (CYDD) was found in 1989 by Türkan SAYLAN and Aysel ÇELİKEL. CYDD gives scholarships to primary, high school and university students. Organization

performs child-oriented, youth-oriented, support to education, environment and nature, support to Soma projects. Totally 73.914 primary school and high school student benefited from scholarships since 1997. Also, under the name of “**Bir Işık da Siz Yakın**” project, 34.150 university students completed their education with ÇYDD scholarships (Çağdaş Yaşamı Destekleme Derneği, 2017). Moreover, within the scope of support to education projects, while 769 kindergartens and 558 playgrounds, schools and dormitories had been built since 1997, material support to schools was provided, library projects and books campaigns were performed. Paint and story competitions, Christmas festivals, summer activities are performed as child-oriented projects. For youth-oriented projects, **Erasmus+** programs which is **EVS (European Voluntary Service)** are provided to youth aged between 18 and 30. This program gives opportunity to work in a voluntary project in Europe. Furthermore, a project called “Kodlamaca” aims students, who are in 5th, 6th and 7th grade and have limited financial possibility, to teach coding method [27, 28].

Çağdaş Eğitim Vakfı (ÇEV) was found in 1994 by Prof.Dr.Türkan Saylan, Prof.Dr.Necla ARAT, and Prof.Dr. Aysel ÇELİKEL, Prof.Dr.Oya BAŞAK, Gülseven YAŞER. Aim of this organization is to come up with a solution to problem faced in national education field and providing modern and qualified education. In this sense, projects named “**Burs Projesi**”, “**Harika Yetenekler Projesi**”, “**Bilimin Harika Yetenekleri Projesi**”, “**ÇEV Kartları Projesi**” are performed. Under the name “Harika Yetenekler Projesi”, youngers who are highly gifted on especially music and other fields of art are supported. “Burs Projesi” provides scholarship to students who needs it. Today, scholarships were provided to more than 16.000 primary school, high school and university students [29].

In the same manner with other educational based NGOs, **Türk Eğitim Vakfı (TEV)** has great enthusiasm too. TEV was founded under the leadership of Vehbi KOÇ and 205 philanthropists in 1967. Their mission is to support the solution of the basic issues of Turkish Government’s education system. Their activity areas are national & international scholarships, youth hostel scholarships for schoolgirls, social activities and other activities etc. According to the 2017 Activity Report, there exists 6766 students with scholarship under TEV organization [59]. Therefore, TEV follows latest technological and digital developments and adapt their projects in this manner.

Another NGO in education sector is **Türk Eğitim Derneği (TED)** which was found in 1928 by Mustafa Kemal ATATÜRK to reach the targeted level in education. TED has been active in the field of education since its establishment as a deep-rooted NGO. At the same time, it supports the educations of Turkish children who do not have sufficient financial situation and provides material and scientific contributions to Turkish education life with their projects and activities. As it was specified in 2017 Activity Report [60], TED has 29,686 students (958 of them have scholarships), 3147 teachers. One of their biggest campaign is “Soma’ya El Ver”. The purpose of the campaign; providing

educational scholarship, psycho-social support and educational material support to the children who lost their fathers and continue their education in the mine disaster at Soma, in 2014.

Milli Eğitim Vakfı (MEV) was established on February 19, 1981 by 29 real and 9 legal entities, including the leading academics, government and businessmen and important institutions and organizations of the country [30]. MEV, which aims to provide education and training in each level and type of educational institutions affiliated to the Ministry of National Education; has been established to provide material and spiritual contribution and to provide new resources for this purpose in order to reach the quality and quantity that will meet the economic, social and cultural needs of the people and society [30]. They built 133 schools across Turkey and 7 student dormitories [31]. They gave scholarships to about 30,000 students and keep awarding students [31].

Compassion International (Compassion) is an international NGO, which pairs ones who are suffering from poverty with compassionate people as a child-advocacy ministry [32]. The ministry's aims making each children a responsible adult by releasing those from economic, spiritual, physical and social poverty [32]. According to 2017 Annual Report of Compassion [33], its total expenses is \$ 817,287,000 including program expenses and supporting services.

World Education (WE) is another NGO in education era committed to improve poor's lives through education [34]. WE's lasting progress in building girls' and women's agency is highlighted in its Annual Report in 2017 [35]. WE mainly develops attempts to help adults and youth live healthier lives and to provide education maintenance. Technology is used to improve the quality of education at each level through teacher support, curricula development and local partnerships. Their total expenses publicized as \$ 46,134,858.

2.3. PSYCHOLOGICAL CONSIDERATIONS

2.3.1. The Impact Of Social Assistance Activities on the Academic Performance of Students in Low-Income Families

Social assistance policies for poverty reduction with different scopes and different budgets have an essential role among its applications [36]. In low-income families, the students might not have sufficient conditions to accomplish their educations or they might have difficulties if they live in bad geographical conditions. Socioeconomic status is one of the most crucial factor that affect the academic performance of students. The most common argument is that the quality of students' academic performance is affected by the socioeconomic status [37]. According to the majority of experts; the low socioeconomic status has negative effect on the academic performance of students; since, the students' several requirements could not be met and hence they do not perform better academically [38]. Also, it is obvious that the students with low socioeconomic status are tended to be

low self esteem because of environmental deficiencies [39]. In Turkey, the education assistants of NGOs' have been started to be managed through Social Assistance and Solidarity Foundations which were founded in 1986. Then with the development of technology they became more systematic [36]. According to the survey on Cemali SARI and Nurettin ERDOĞAN's article, parents would have some trouble when they send their children to school if any assistance had not exists. With the help given, the possibility of students of low-income families might have little worry about the situation when going to school has been declared. Hence, students with assistance become willing to go to school. Additionally, if the students do not attend school, they know they lose the education assistance. Finally, parents participated in the survey have declared that the education assistance affect the success of students positively by increasing assists [36].

2.3.2. Social Assistance Effect on Motivation of Students

Academically, motivation describes a student's desire, need, aspiration and obligation to participate in the learning process and become successful [41]. According to Goodman et al., motivation is defined as the internal force that compels a person to meet a certain need [53]. Also, studies indicate that motivation is a key factor in initiating and maintaining the learning process of the students in education [42]. Students might require support from others to overcome difficulties during their lives. Hence, to have a successful academic life, they apply for support elements such that families, friends or a special person in their lives according to Erdogan Tezci et. al. [40]. The relationship between socioeconomic status of parents and grades of students was also examined by Strenze in 2007 [43].

2.4. DIGITALIZATION

In an increasingly demanding surrounding, to cope with the essential challenges of an era in which digitalization serves as a catalyst for main social changes and to maximize the effect of the work done by third sector organizations must rapidly adapt and evolve [49]. To be able to use available resources effectively, you need to transform your organization's working way [50]. Even though technology is not the answer alone, it has remarkable power for this transformation [50]. Combining your processes, people and technology by interiorizing well-thought-out digital strategy helps you to speed up your impact while serving your constituencies and accomplishing your mission [51].

Social media, e-commerce, mobile computing, artificial intelligence and the Internet of Things which are contained within the innovation in the private sector rapidly disrupts the way of interaction between donors, employees, beneficiaries and your organization [52]. Unless you can provide expected level of experience and transparency that your constituents expect, you are not be able to gain their trust, so they go somewhere else [52]. In the meantime, some non-profit organizations innovate with digital technology, which may limit others' access to donors, highly skilled employees and volunteers, since many NGOs compete for the same resource pool [53]. Digitalization for NGOs

is a crucial, organizational-wide approach that unites innovation with a free-flow approach which is able to enable innovation to create an exponential effect on process, technology and people [54].

2.4.1. NGO System Examples

In this section, some cases of NGOs, which innovate with digital strategies, are given in details. As it is indicated in section ‘NGO Examples Around the World’ OxFam is exemplified as international NGO [6]. OxFam Hong Kong follows a digital strategy, which innovates in the cloud to accumulate donations. The strategy they follow increased the number of page views while increasing visitor experience on their website for the annual competition to raise funds by more than 600 percent, which stimulate growth in the donations from 117,000 to 774,000 years throughout the year [55]. OxFam Hong Kong used a cloud platform, which helped them to provide quality and reliable user experience to donors in the intense competition day traffic and to maintain stability [56].

Second case is about paper-to-digital conversion of Compassion International, which is a child-advocacy ministry, which offers education, health, social and spiritual services to 1.8 million children over 25 countries. Compassion is a leader in holistic offspring development through sponsorship. According to UNICEF about 385 million children live in uttermost poverty [57].

Studies in the Journal of Political Economy [58] indicated that 50-80% of kids sponsored by compassion-sponsorship accomplished their university education compared to non-sponsored children. After heavy investments in digital technology, Compassion adopted a transformational digital strategy over 800 different IT systems in the United States and more than 20 countries [57]. Compassion clearly had a crucial effect, but wanted to do better [42]. The organization found out a great opportunity for centralizing its infrastructure with the aid of digital transformation [58]. Today, Compassion increases the quality of the impact it creates on existing beneficiaries, not only to serve more children, but also as evidenced by the digital technology's annual growth rate of 7% per annum [58].

The digital transformation of Compassion has resulted faster connections between children and sponsors [57]. Before the transformation, it was taking a few months to identify a child in need, sign up to organization and to link them to a sponsor [57]. Furthermore, the organization is expecting to decrease over 300,000 hours per year by moving existing paper forms used to a digital platform offered through cloud platform and mobile devices [44]. In addition, by reducing the time required for a kid to connect with their donors from six months to several weeks made the correspondence faster [44].

Table 3 represents whether some of the known NGOs in education era, mentioned in previous sections, have some basic functions or not in their websites or their applications on Android or iOS platforms.

1. Online surfing without login	5. Feedback mechanisms	9. Online purchase availability	• There exists no application.
2. Entry with user login	6. Payment systems	10. Separation of donation type	✓ There exists the function.
3. Being a volunteer choice	7. Blog existence	11. List of completed projects	✗ The function does not exist.
4. Pop-ups usage	8. Social media usage	12. Scoring	

Table 3 Comparisons of NGOs within Web Platform.

Functions	Compassion	World Education	MEV	TEV	TED	AÇEV	ÇYDD	ÇEV	İLKÝAR
1	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	✓	✗	✗	✗	✗	✗	✗	✗	✓
3	✗	✓	✗	✓	✗	✓	✓	✓	✓
4	✓	✗	✗	✗	✗	✗	✗	✗	✗
5	✓	✗	✗	✗	✗	✗	✗	✓	✗
6	✓	✓	✓	✓	✓	✓	✓	✓	✗
7	✓	✗	✗	✗	✗	✗	✗	✗	✗
8	✓	✓	✓	✓	✓	✗	✗	✓	✗
9	✓	✗	✗	✗	✗	✓	✗	✗	✗
10	✓	✓	✓	✓	✓	✓	✓	✓	✓
11	✗	✓	✗	✗	✗	✗	✗	✓	✓
12	✗	✗	✗	✗	✗	✗	✗	✗	✗

Table 4 Comparisons of NGOs within Android Platform.

Functions	Compassion	World Education	MEV	TEV	TED	AÇEV	ÇYDD	ÇEV	İLKÝAR
1	•	•	•	✓	•	•	•	•	•
2	•	•	•	✗	•	•	•	•	•
3	•	•	•	✗	•	•	•	•	•
4	•	•	•	✗	•	•	•	•	•
5	•	•	•	✗	•	•	•	•	•
6	•	•	•	✓	•	•	•	•	•
7	•	•	•	✗	•	•	•	•	•
8	•	•	•	✓	•	•	•	•	•
9	•	•	•	✗	•	•	•	•	•
10	•	•	•	✓	•	•	•	•	•
11	•	•	•	✗	•	•	•	•	•
12	•	•	•	✗	•	•	•	•	•

Table 5 Comparisons of NGOs within Web Platform.

Functions	Compassion	World Education	MEV	TEV	TED	AÇEV	ÇYDD	ÇEV	İLKÝAR
1	•	•	•	•	•	✓	•	•	•
2	•	•	•	•	•	✓	•	•	•
3	•	•	•	•	•	✗	•	•	•
4	•	•	•	•	•	✗	•	•	•
5	•	•	•	•	•	✗	•	•	•
6	•	•	•	•	•	✓	•	•	•
7	•	•	•	•	•	✗	•	•	•
8	•	•	•	•	•	✗	•	•	•
9	•	•	•	•	•	✓	•	•	•
10	•	•	•	•	•	✗	•	•	•
11	•	•	•	•	•	✗	•	•	•
12	•	•	•	•	•	✗	•	•	•

2.5. CONCLUSION

In the increasingly demanding environment, NGOs try to serve their constituencies effectively, build more connections between beneficiaries and donors fast. This literature review indicates that NGOs serve in different fields. As the I-NGOS Project related with education, researches centered upon education. Education oriented NGOs aims to provide basic needs of students and help them to improve their education to the advanced level. Besides, researches from the psychological perspective of NGOs such as the impacts of NGOs' on students' academic success and the ways of increasing students' motivation explained in details. To see the effects of social assistance on academic performance of students some arguments are examined and found beneficial to support NGOs' functions. These arguments have highly related information between NGOs' activities and the students' academic performance. Hence, to make İLKÝAR's activities better performed; according to the handled necessary arguments, it is decided that an optimization system should be developed. As it is examined in Table 3, İLKÝAR has no existence on Android or iOS platforms and some functions are missing on Web compared to other NGOs. With the help of this comparison, which properties, NGO Management System that would be developed for İLKÝAR will have is decided.

Additionally, the social assistance effect on motivation of students is discussed detailly and it is obtained that to have a successful academic life students might require support to handle problems during their academic life. If they are provided motivation, they could adapt to their academic success and be successful. Furthermore, the importance of transformational digital strategies for NGOs are given above. Eventually, contribution of digitalization to NGOs explained in the light of real life examples.

3. SOFTWARE REQUIREMENTS SPECIFICATIONS

3.1. INTRODUCTION

Non-Governmental Organizations (NGOs) are complex organizations to manage. This project aims to ease NGOs' management process via Intelligent Non-Governmental Organization Management Systems, which will be called as I-NGOs management system hereupon.

3.1.1. Purpose

This document's purpose is to describe the software requirements specifications of I-NGOs management system. First of all, the scope of project is explained. In this part, some terms, commonly used during the project, are explained and attached to the glossary. Overall description part aims to give the perspective of the product and the system. In the following section, development methodology, which is applied during the project is explained. Moreover, user characteristics are explained. In the requirements specification section, external interface requirements, functional requirements and performance requirements are given in detail. This section includes technical details and use cases briefly for software developers.

3.1.2. Scope of Project

NGO can be defined as non-profit and voluntariness-based group, which is organized in the fields of social development, human rights and the environment at different levels such local, national or international. In spite of the fact that they share a few attributes with state and private sector organizations, NGOs have particular organizational features. They manage relationships with various actors, run different projects and face special challenges. At this point, NGO management differs from business management and public-sector administration. Management of NGOs is complex in terms of design and implementation of such systems. This project aims to a ***non-profitable NGO (Non-Governmental Organization) management system*** by developing client interfaces and efficient-multi serve implementations. The vision is to design a generic system to adapt other NGOs according to their nature. On the other hand, the mission is to develop Intelligent NGOs management system for ILKYAR. It is an NGO serves an education era in Turkey. The purpose of ILKYAR is to provide motivation to keep students, who have relatively limited opportunities, excited about their education and contribute their academic lives without carrying any political concern, and to realize the activities by knowing that people are equal. The system implementation is expected to be in the form of a server-client model in the form of a cloud service. The system controls volunteer membership (join/leave), participation request for a particular project, approval of participation, project details and schedule, etc. There are several client roles and each needs a different interface. The system is expected to learn from every project to become more intelligent in providing feedback in organizing

future projects and controlling the participation for both volunteers and target organization (school or others). Client could be mobile (IOS, Android) as well immobile (desktop or laptop).

3.1.3. Glossary

Table 6 SRS Glossary

Term	Definition
NGO	Non-Governmental Organization (NGO) is a citizen-based association that works independently of the government and is often used to provide resources or to serve certain social or political purposes [66].
I-NGO Management System	It is a server-client model system in the form of a cloud service, controlling participant activities such as volunteer membership (join/leave), participation request for a particular project, approval of participation, project details and schedule, etc.
Intelligent System	Technologically advanced machines that can perceive their environment, interact with users via interfaces and react to the world around them [67].
ILKYAR	It is an NGO serves an education era in Turkey.
Participant	A user interacts with the interfaces.

3.2. OVERALL DESCRIPTION

3.2.1. Product Perspective

I-NGO management system is a server-client model system in the form of a cloud service. Its purpose to ease NGOs management system and make them run their all processes via this software. Functions specified according to participants. Each participant needs different functions so different interfaces.

3.2.2. Participants

There are ten types of participant, who are supposed to interact with I-NGO management system. Functional requirements identified according to these participants. All participants are supposed to read and understand Turkish language, because I-NGOs management system language is Turkish.

3.2.3. NGO Head

NGO Head is the head of NGO responsible for administration. One of main responsibility is to manage users by adding new users, listing existing ones and authenticate them according to their roles

in the NGO. Furthermore, s/he creates, edits, displays projects and project schedule, manages logistics and materials sent to schools within the scope of projects.

3.2.4. Project Manager

NGO Head adds Project Manager to the system. System allows creating more than one project manager. Project managers are responsible for editing the projects assigned to them and their schedules. They decide tasks needed in the projects, designates volunteers to projects, communicates with the related schoolmaster and manages logistic functions.

3.2.5. Scholarship Committee

Scholarship Committee must be added by NGO Head. There might be more than one Scholarship Committee user. They appoint scholarship holders and Yön-Der and manage relations between scholarship holders.

3.2.6. Yön-Der

Yön-Der is a person who is responsible from scholarship holders' education background. Scholarship Committee appoints scholarship holders to Yön-Der. Yön-Der monitors scholarship holders, communicates with them and creates report about them via I-NGOs management system.

3.2.7. Donator

Donator contributes to NGO and provide fund for scholarships. Donator differs from other participants at the point of registration. Donator must register to system by her/himself. I-NGOs management system keep the records of donations. Donator is able to choose type of donation and scholarship holder to donate.

3.2.8. Scholarship Holder

Scholarship Holders receives financial aid from the NGO. Scholarship Holders are registered by NGO Head to the system. They must fulfill their personal information and upload their transcripts or needed documents. Yön-Der might be appointed them through the system, and then they become able to communicate with her/him.

3.2.9. Volunteer

Volunteer freely offers to take part in NGO and its projects. S/he needs to apply for volunteering. If their application is approved, they become able to participate projects.

3.2.10. Schoolmaster

Schoolmaster is the head of school that the NGO visits during its projects. NGO Head registers schoolmaster to the system. Schoolmaster is able to communicate with the NGO, reply its invitations,

invite the NGO and suggest successful students for scholarships through the I-NGO management system.

3.2.11. Host School Teacher

Host school teacher is the teacher where the NGO carries out its projects. Host school teachers can follow project details and suggest successful students for scholarships via the system.

3.2.12. Student

Student is the user who participates projects when NGO visits their school. S/he is able to provide feedback and apply for scholarships.

3.3. Development Methodology

I-NGOS Project is developed using Scrum methodology; since, it provides better scheduling and controlling of the project. To apply an agile methodology, it is enough to understand the proper perspective of the system design. Then, details should be divided into aspects. Incremental design reduces the cost of changes. This method emphasizes real-time communication and face-to-face discussion with NGO. Besides, as the NGO is on site, team gets feedback instantly so, identifies the areas for improvement and can revise their practices, so continuous integration and tests are provided. Scrum process helps the NGO to enlarge the quality of software, expect and manage better with changes, render better predictions while spending less time to form software, control the project schedule and state easily. High value features are evolved and delivered to NGO quickly with short cycles. Team members enjoy work, since the nonproductive work reduced, and see their work valued and used which increases their motivation. Scrum makes alignment of development work and NGO's needs easier by re-prioritizing work frequently, to ensure maximum valued delivery. Besides, it helps to monitor the project easily, catch and address the issues quickly. Project tasks are divided into sprints. Feedbacks are given at the end of each sprint by the project advisors. The meetings are scheduled weekly with the project advisors. Team members communicate with each other daily (around 15 mins) to figure out the information flow. Therefore, to manage project better; a desktop Scrum application MeisterTask is used. Hence, the stories, to do lists, in progress tasks, done tasks and verified tasks are determined obviously thanks to the application.

3.4. REQUIREMENTS SPECIFICATION

3.4.1. External Interface Requirements

3.4.1.1. User Interfaces

The user interface is decided as it will be performed on both Web, Android and iOS platforms.

3.4.1.2. Hardware Interfaces

The system might require a barcode reader to scan the barcodes of the materials in depot. In addition to this, to use the system on Android or iOS, any smartphone or tablet which uses Android or iOS is needed.

3.4.1.3. Software Interfaces

To use barcode reader, some barcode reader software may be required.

3.4.1.4. Communications Interfaces

No external communications interfaces are required.

3.4.2. Functional Requirements

3.4.2.1. NGO Head

Use Case:

- Login
- List Project Operations
- Create Project
- Create Project Schedule
- List Completed Projects
- List Ongoing Projects
- Edit Projects
- View Project Schedule
- Edit Project Schedule
- Manage Logistic Functions
- Manage Materials Sent
- List Project Managers
- View Details of Project Manager
- Add Project Manager
- Appoint Project Manager to Project
- List Scholarship Committee
- View Details of Scholarship Committee Member
- Add Scholarship Committee
- List Yön-Ders
- View Details of Yön-Der
- Add Yön-Der
- View Yön-Der Reports
- List Schoolmasters

- View Details of Schoolmaster
- Add Schoolmaster
- List Host School Teachers
- View Details of Host School Teachers
- List Students
- View Details of Student
- List Volunteers
- List Volunteering Applications
- Approve Volunteering
- Reject Volunteering
- View Details of Volunteer
- List Donators
- View Details of Donators
- List Scholarship Holders
- View Details of Scholarship Holders
- Add Scholarship Holders
- Authenticate Users
- List Invitation Requests
- Approve Invitation Requests
- Reject Invitation Request
- Perform E-Mail Operations
- Perform Message Operations
- Edit Profile

Diagram:

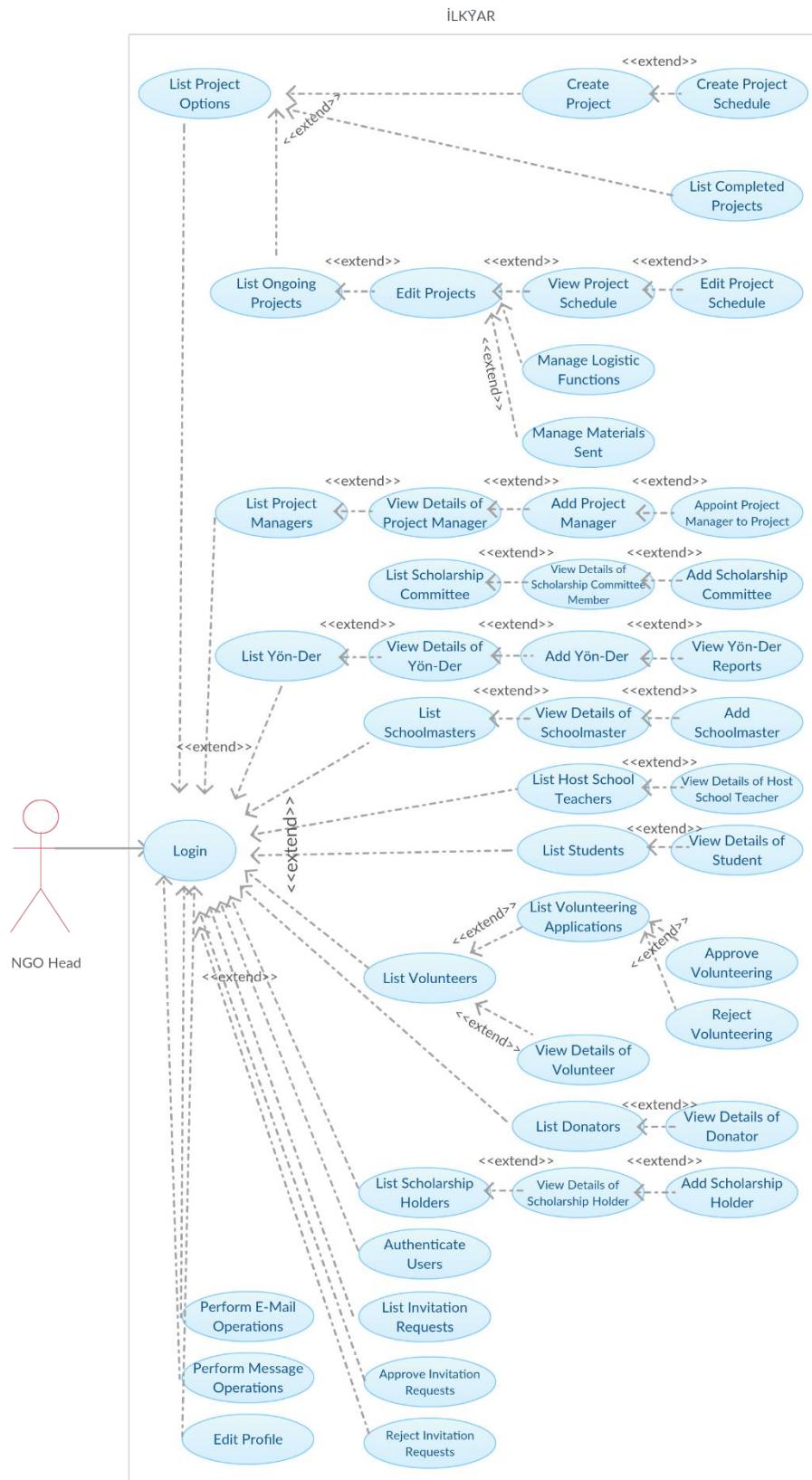


Figure 1 Use case diagram of NGO Head.

Brief Description:

NGO Head is able to perform main operations, which is explained in Figure 1, NGO Head use case diagram when s/he logins to the system. These main functions are to list project operations, create project, create project schedule, list completed projects, list ongoing projects, edit projects, view project schedule, edit project schedule, manage logistic functions, manage materials sent, list Project Managers, view details of Project Manager, add Project Manager, appoint Project Manager to project, list Scholarship Committee, view details of Scholarship Committee member, add Scholarship Committee, list Yön-Ders, view details of Yön-Der, add Yön-Der, view Yön-Der reports, list Schoolmasters, view details of Schoolmaster, add Schoolmaster, list Host School Teachers, view details of Host School Teachers, list Students, view details of Student, list Volunteers, list volunteering applications, approve volunteering, reject volunteering, view details of Volunteer, list Donators, view details of Donators, list Scholarship Holders, view details of Scholarship Holders, add Scholarship Holders, authenticate users, perform e-mail operations, perform message operations, and edit his/her profile.

Initial Step by Step Description:

1. NGO Head should login by the Login Interface.
 - 1.1. If the password is invalid for the user name, NGO Head must re-login.
 - 1.2. NGO Head can list project operations.
 - 1.2.1. NGO Head can create project.
 - 1.2.1.1. NGO Head can create project schedule
 - 1.2.2. NGO Head can list completed projects.
 - 1.2.3. NGO Head can list ongoing projects.
 - 1.2.3.1. NGO Head can edit projects.
 - 1.2.3.1.1. NGO Head can view project schedule.
 - 1.2.3.1.1.1. NGO Head can edit project schedule.
 - 1.2.3.1.2. NGO Head can manage logistic functions.
 - 1.2.3.1.3. NGO Head can manage materials sent.
 - 1.3. NGO Head can list Project Managers.
 - 1.3.1. NGO Head can view details of Project Manager.
 - 1.3.2. NGO Head can add Project Manager.
 - 1.3.3. NGO Head can appoint Project Manager to project.
 - 1.4. NGO Head can list Scholarship Committee.
 - 1.4.1. NGO Head can view details of Scholarship Committee Member.
 - 1.4.2. NGO Head can add Scholarship Committee.

1.5. NGO Head can list Yön-Ders.

1.5.1. NGO Head can view details of Yön-Der.

1.5.2. NGO Head can add Yön-Der.

1.5.3. NGO Head can view Yön-Der reports.

1.6. NGO Head can list Schoolmasters.

1.6.1. NGO Head can view details of Schoolmaster.

1.6.2. NGO Head can add Schoolmaster.

1.7. NGO Head can list Host School Teachers.

1.7.1. NGO Head can view details of Host School Teachers.

1.8. NGO Head can list Students.

1.8.1. NGO Head can view details of Student.

1.9. NGO Head can list Volunteers.

1.9.1. NGO Head can list volunteering applications.

1.9.1.1. NGO Head can approve volunteering.

1.9.1.2. NGO Head can reject volunteering.

1.9.2. NGO Head can view details of Volunteer.

1.10. NGO Head can list Donators.

1.10.1. NGO Head can view details of Donators.

1.11. NGO Head can list Scholarship Holders.

1.11.1. NGO Head can view details of Scholarship Holders.

1.11.2. NGO Head can add Scholarship Holders.

1.12. NGO Head can authenticate users.

1.13. NGO Head can perform E-Mail operations.

1.14. NGO Head can perform message operations.

1.15. NGO Head can edit profile.

3.4.2.2. Project Manager

Use Case:

- Login
- List Project Operations
- List Completed Projects
- List Ongoing Projects
- Edit Projects
- Specify Project Requirements
- View Project Schedule

- Edit Project Schedule
- Manage Logistic Functions
- Manage Materials Sent
- List Schoolmasters
- View Details of Schoolmaster
- List Host School Teachers
- View Details of Host School Teachers
- List Students
- View Details of Student
- List Volunteers
- View Details of Volunteer
- Assign Volunteers
- Define Tasks
- Manage Accommodation Functions
- Scores Volunteers
- Perform E-Mail Operations
- Perform Message Operations
- Edit Profile

Diagram:

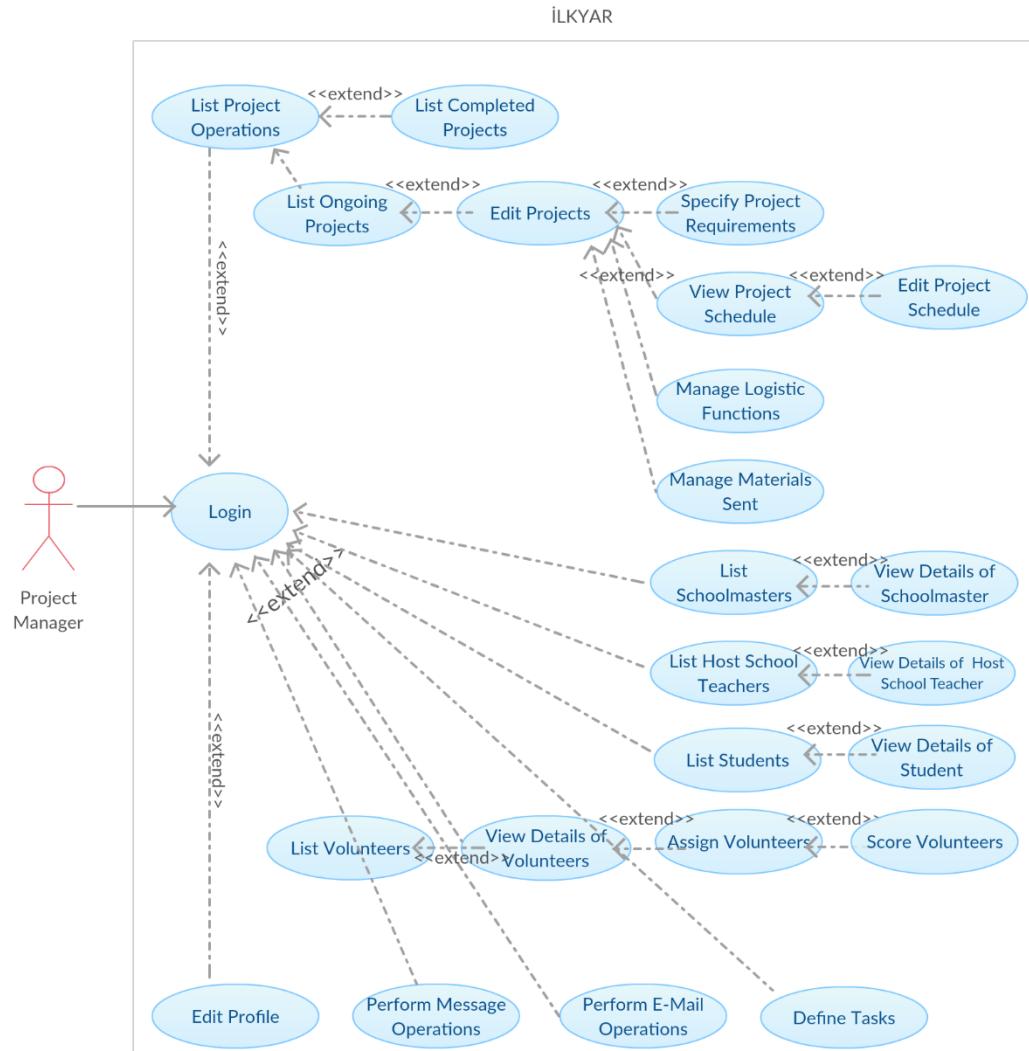


Figure 2 Use case diagram of Project Manager.

Brief Description:

As it could be seen on Figure 2 Use case diagram of Project Manager, s/he is able to login to the system. After the login operation, s/he might list project operations, list completed projects, list ongoing projects, edit projects, specify project requirements, view project schedule, edit project schedule, manage logistic functions, manage materials sent, list Schoolmasters, view details of Schoolmaster, list Host School Teachers, view details of Host School Teachers, list Students, view details of Student, list Volunteers, view details of Volunteer, assign Volunteers, define tasks, perform e-mail operations, perform message operations, and edit his/her profile.

Initial Step by Step Description:

1. Project Manager should login the system.
 - 1.1. If the password is invalid for the user name, Project Manager must re-login.
 - 1.2. Project Manager can list project operations.
 - 1.2.1. Project Manager can list completed projects.
 - 1.2.2. Project Manager can list ongoing projects.
 - 1.2.2.1. Project Manager can edit projects.
 - 1.2.2.1.1. Project Manager can specify project requirements.
 - 1.2.2.1.2. Project Manager can view project schedule.
 - 1.2.2.1.2.1. Project Manager can edit project schedule.
 - 1.2.2.1.3. Project Manager can manage logistic functions.
 - 1.2.2.1.4. Project Manager can manage materials sent.
 - 1.3. Project Manager can list Schoolmasters.
 - 1.3.1. Project Manager can view details of Schoolmaster.
 - 1.4. Project Manager can list Host School Teachers.
 - 1.4.1. Project Manager can view details of Host School Teachers.
 - 1.5. Project Manager can list Students.
 - 1.5.1. Project Manager can view details of Student.
 - 1.6. Project Manager can list Volunteers.
 - 1.6.1. Project Manager can view details of Volunteer.
 - 1.6.2. Project Manager can assign Volunteers to projects.
 - 1.7. Project Manager can define tasks.
 - 1.8. Project Manager can perform E-Mail operations.
 - 1.9. Project Manager can perform message operations.
 - 1.10. Project Manager can edit profile.

3.4.2.3. Scholarship Committee

Use Case:

- Login
- List Scholarship Holders
- View Details of Scholarship Holder
- Approve Scholarship Holder
- List Yön-Ders
- View Details of Yön-Der

- Appoint Yön-Der
- Add Yön-Der
- List Yön-Der Reports
- View Yön-Der Reports
- Perform E-Mail Operations
- Perform Message Operations
- Edit Profile

Diagram:

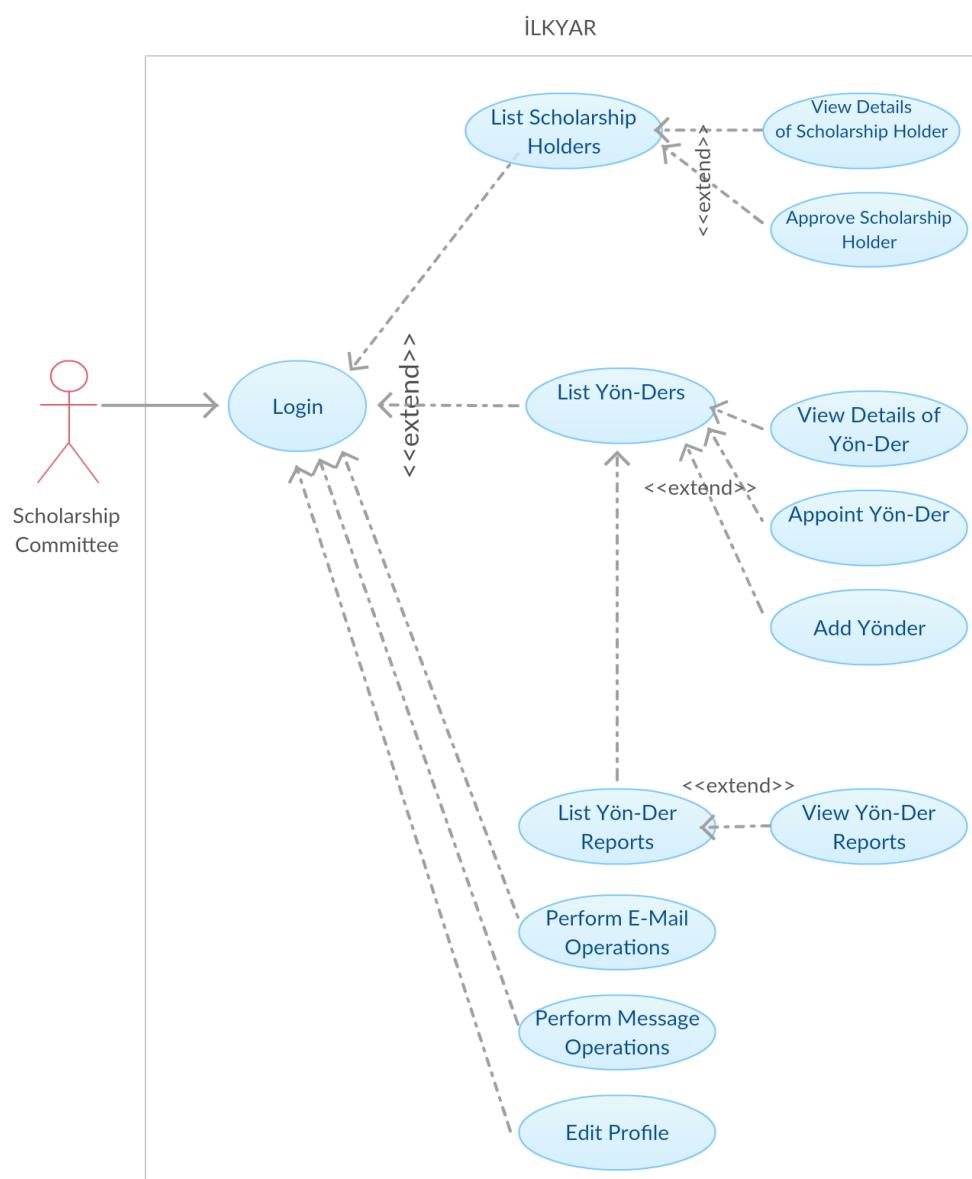


Figure 3 Use case diagram of Scholarship Committee.

Brief Description:

Scholarship Committee can perform some functions such as login, list Scholarship Holders, view details of Scholarship Holder, appoint Scholarship Holder, communicate w/ Scholarship Holder, list Yön-Ders, view details of Yön-Der, appoint Yön-Der, add Yön-Der, communicate w/ Yön-Der, list Yön-Der reports, view Yön-Der reports, perform e-mail operations, perform message operations, and edit his/her profile.

Initial Step by Step Description:

1. Scholarship Committee should enter the system with login.
 - 1.1. If the password is invalid for the user name, Scholarship Committee must re-login.
 - 1.2. Scholarship Committee can list Scholarship Holders.
 - 1.2.1. Scholarship Committee can view details of Scholarship Holders.
 - 1.2.2. Scholarship Committee can appoint Scholarship Holder.
 - 1.2.3. Scholarship Committee can communicate w/ Scholarship Holder.
 - 1.3. Scholarship Committee can list Yön-Ders.
 - 1.3.1. Scholarship Committee can view details of Yön-Der.
 - 1.3.2. Scholarship Committee can appoint Yön-Der.
 - 1.3.3. Scholarship Committee can add Yön-Der.
 - 1.3.4. Scholarship Committee can communicate w/ Yön-Der.
 - 1.3.5. Scholarship Committee can list Yön-Der reports to figure out the Scholarship Holder's situation.
 - 1.3.5.1. Scholarship Committee can view Yön-Der report details.
 - 1.4. Scholarship Committee can perform E-Mail operations.
 - 1.5. Scholarship Committee can perform message operations.
 - 1.6. Scholarship Committee can edit profile.

3.4.2.4. Yön-Der

Use Case:

- Login
- List Scholarship Holders
- View Details of Scholar Holder
- List Reports
- View Details of Reports
- Write Report about the Scholarship Holder
- Perform E-Mail Operations

- Perform Message Operations
- Edit Profile

Diagram:

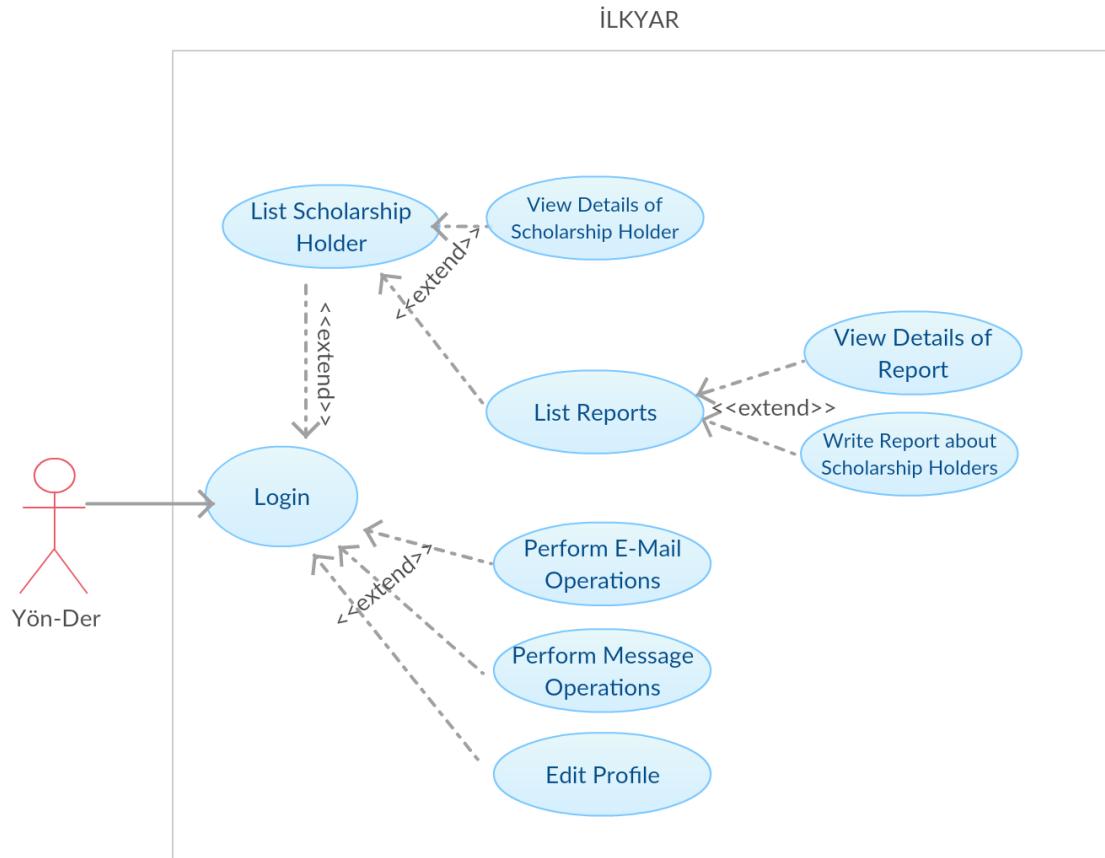


Figure 4 Use case diagram of Yön-Der.

Brief Description:

Yön-Der use case diagram (Figure 4) explains main operations that a Yön-Der can perform when s/he logs in to the system. Yön-Der can perform functions such that, list Scholarship Holders, view details of Scholar Holder, check own Scholarship Holders' academic standings, list reports, view details of reports, write report about the Scholarship Holder, communicate with Scholarship Holder, communicate with Scholarship Committee, perform e-mail operations, perform message operations, edit his/her profile.

Initial Step by Step Description:

1. Yön-Der should enter the system with login.
 - 1.1. If the password is invalid for the user name, Yön-Der must re-login.
 - 1.2. Yön-Der can list Scholarship Holders.

- 1.2.1. Yön-Der can view details of Scholarship Holder.
- 1.2.2. Yön-Der can check Scholarship Holders' academic standings.
- 1.2.3. Yön-Der can list reports.
 - 1.2.3.1. Yön-Der can view details of reports
 - 1.2.3.2. Yön-Der can also write report about Scholarship Holders to inform their donators in detail.
- 1.3. Yön-Der can communicate with Scholarship Holders assigned to him.
- 1.4. Yön-Der can communicate with Donators to inform them about Scholarship Holders that they give scholarship.
- 1.5. Yön-Der can perform E-Mail operations.
- 1.6. Yön-Der can perform message operations.
- 1.7. Yön-Der can edit profile.

3.4.2.5. Donator

Use Case:

- Register
- Login
- List Donation Types
- Make Donations
- Select Type of Donations
- List Scholarship Holders
- View the Detail of Scholarship Holder
- Perform E-Mail Operations
- Perform Message Operations
- Edit Profile

Diagram:

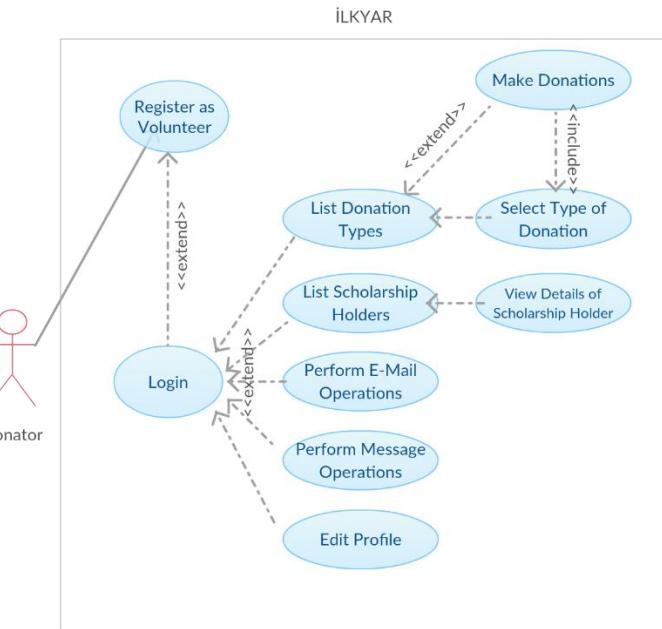


Figure 5 Use case diagram of Donator.

Brief Description:

As it can be seen in Figure 5, donator can perform register, login, list donation types, make donations, select type of donations, list Scholarship Holders, view the detail of Scholarship Holder, perform e-mail operations, perform message operations, and edit his/her profile.

Initial Step by Step Description:

1. Donator needs to register to the system.
 - 1.1. If NGO Head approves her/his volunteering then, s/he can use following functions.
2. Donator should login by the Login Interface.
 - 2.1. If the password is invalid for the user name, Donator must re-login.
 - 2.2. Donator can list all type of donations.
 - 2.2.1. Donator is able to make donations.
 - 2.2.1.1. Donator must select the donation type to make donation.
 - 2.3. Donator can list the list of Scholarship Holders.
 - 2.3.1. Donator can view the details of Scholarship Holder.
 - 2.4. Donator can perform E-Mail operations.
 - 2.5. Donator can perform message operations.
 - 2.6. Donator can edit profile.

3.4.2.6. Scholarship Holder

Use Case:

- Login
- View Details of Yön-Der
- Perform E-Mail Operations
- Perform Message Operations
- Edit Profile

Diagram:

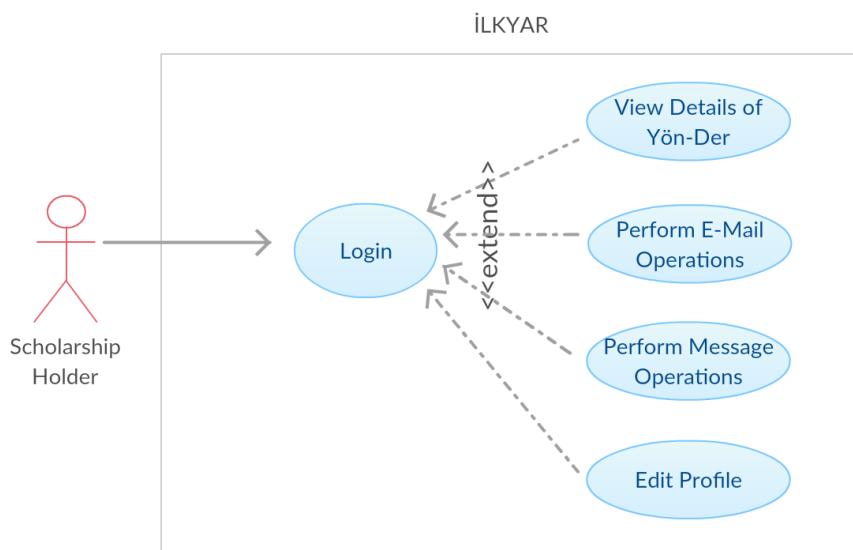


Figure 6 Use case diagram of Scholarship Holder.

Brief Description:

The Scholarship Holder is capable of doing some functions as it is shown In Figure 6 - Use case diagram of Scholarship Holder. These functions are login, view details of Yön-Der, communicate with Yön-Der, perform e-mail operations, perform message operations, and edit his/her profile.

Initial Step by Step Description:

1. Scholarship Holder should enter the system with login.
 - 1.1. If the password is invalid for the user name, Scholarship Holder must re-login.
 - 1.2. Scholarship Holder could view the details of his/her Yön-Der.
 - 1.2.1. Scholarship Holder could communicate with his/her Yön-Der.
 - 1.3. Scholarship Committee can perform E-Mail operations.
 - 1.4. Scholarship Committee can perform message operations.
 - 1.5. Scholarship Committee can edit profile.

3.4.2.7. Volunteer

Use Case:

- Login
- Register
- List Project Operations
- List Attending Projects
- List New Coming Projects
- Choose Projects to Participate
- Select Project Activities
- List Attended Projects
- Provide Feedback
- Perform E-Mail Operations
- Perform Message Operations
- Edit Profile

Diagram:

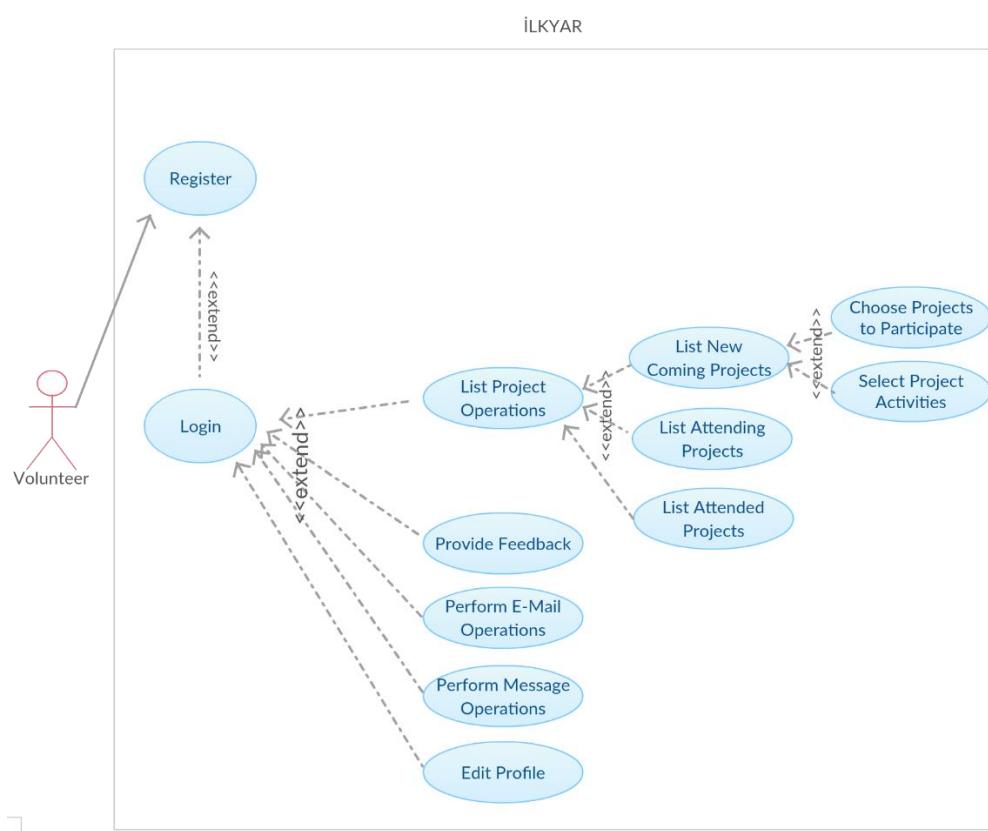


Figure 7 Use case diagram of Volunteer.

Brief Description:

Volunteer is able to perform main operations, which explained in Figure 7 volunteer use case diagram when s/he logins or registers to the system. These main functions are to list project operations, list attending projects, list new coming projects, choose projects to participate, select project activities, list attended projects, provide feedback, perform e-mail operations, perform message operations, and edit his/her profile.

Initial Step by Step Description:

1. Volunteer needs to register to the system.
 - 1.1. If NGO Head approves her/his volunteering then, s/he can use following functions.
2. Volunteer should login by the Login Interface.
 - 2.1. If the password is invalid for the user name, volunteer must re-login.
 - 2.2. Volunteer can list all project operations.
 - 2.2.1. Volunteer can list her/his attending projects.
 - 2.2.2. Volunteer can list upcoming projects.
 - 2.2.2.1. Volunteer can choose the project that s/he wants to participate.
 - 2.2.2.2. Volunteer can select project activities that s/he would like to perform.
 - 2.2.3. Volunteer can list attended projects.
 - 2.2.4. Volunteer can provide feedback about the projects s/he took place.
 - 2.2.5. Volunteer can perform E-Mail operations.
 - 2.2.6. Volunteer can perform message operations.
 - 2.2.7. Volunteer can edit profile.

3.4.2.8. Schoolmaster

Use Case:

- Login
- List Invitations
- View the Details of Invitation
- Reply Invitations
- View Project Schedule
- Specify Requirements
- Give Approvals to Students Selected by HST
- Add Student to Project
- Add Host School Teacher to Project
- Provide Feedback
- Invite İLKÝAR for Project
- Suggest Successful Students for Scholarship

- Suggest Successful Students for Projects
- Perform E-Mail Operations
- Perform Message Operations
- Edit Profile

Diagram:

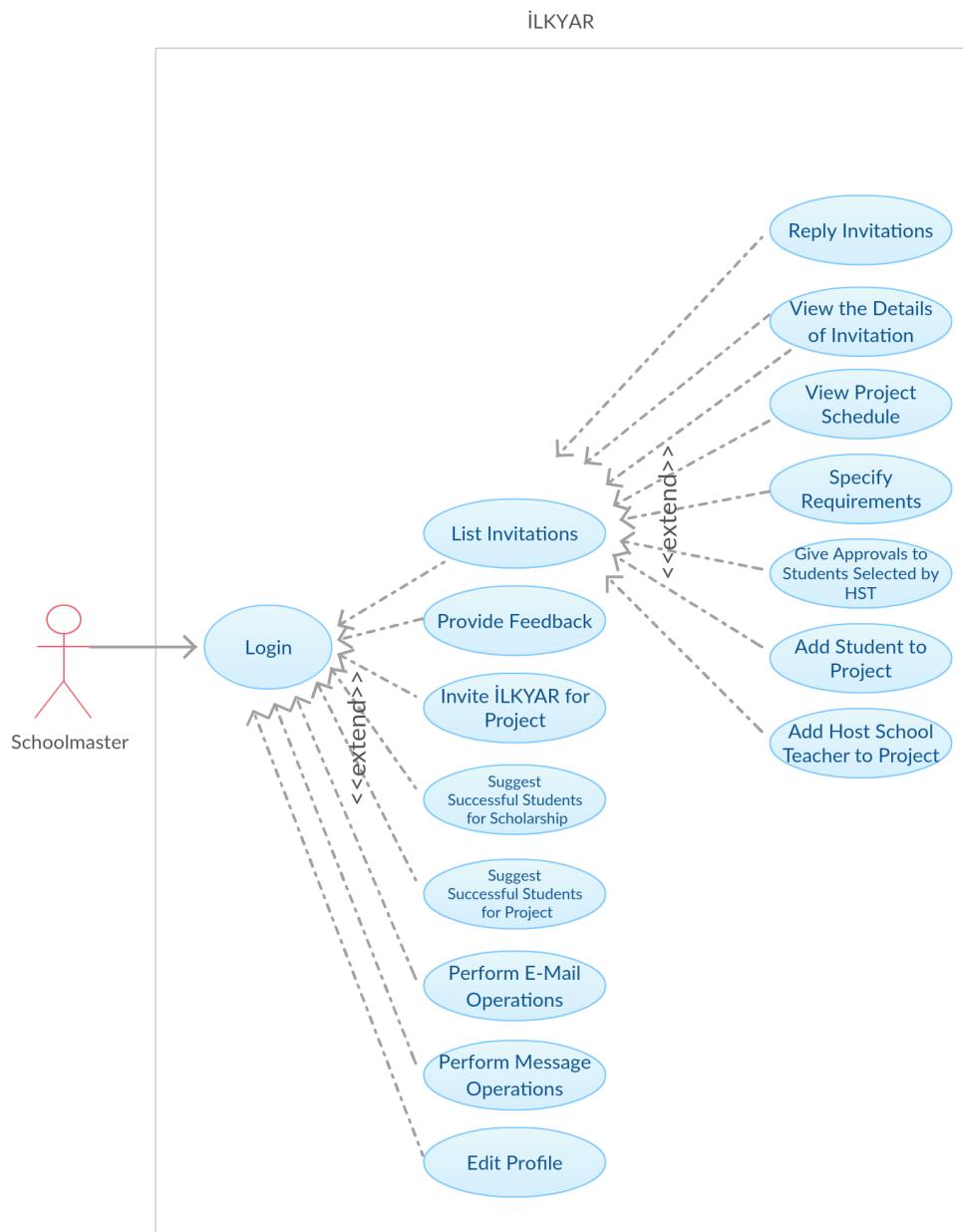


Figure 8 Use case diagram of Schoolmaster.

Brief Description:

Schoolmaster use case diagram (Figure 8) explains the main operations that a Schoolmaster can perform when s/he logs in to the system. Schoolmaster can perform functions such that list invitations,

list unanswered invitations, list approved invitations, list rejected invitations, view the details of invitation, reply invitations, view activity list and schedule, specify requirements, give approvals to students selected by HST, add student to project, add Host School Teacher to project, provide feedback, invite İLKÝAR for project, suggest successful students for scholarship, perform e-mail operations, perform message operations and edit his/her profile.

Initial Step by Step Description:

1. Schoolmaster should login the system.
 - 1.1. If the password is invalid for the user name, Schoolmaster must re-login.
 - 1.2. Schoolmaster can list all project invitations that are sent from İLKÝAR.
 - 1.2.1. Schoolmaster can list the unanswered project invitations.
 - 1.2.1.1. Schoolmaster can reply project invitations.
 - 1.2.1.2. Schoolmaster can view the details of project invitation.
 - 1.2.2. Schoolmaster can list the rejected project invitations.
 - 1.2.2.1. Schoolmaster can view the details of rejected project invitation.
 - 1.2.3. Schoolmaster can list the approved project invitations.
 - 1.2.3.1. Schoolmaster can view the details of approved project invitation.
 - 1.2.3.2. Schoolmaster can view activity list and schedule of the related project.
 - 1.2.3.3. Schoolmaster can specify requirements of the related project.
 - 1.2.3.4. Schoolmaster can give approvals to Students selected by HST for related project to guarantee that selected Student is allowed to participate to project by his family.
 - 1.2.3.5. Schoolmaster can add Student to the related project.
 - 1.2.3.6. Schoolmaster can add HST to related project.
 - 1.3. Schoolmaster can provide feedback for the project s/he participates.
 - 1.4. Schoolmaster can invite İLKÝAR for project.
 - 1.5. Schoolmaster can suggest successful Students for scholarship.
 - 1.6. Schoolmaster can suggest successful Students for projects.
 - 1.7. Schoolmaster can perform e-mail operations.
 - 1.8. Schoolmaster can perform message operations using message service in system.
 - 1.9. Schoolmaster can edit his/her profile as s/he wishes.

3.4.2.9. Host School Teacher

Use Case:

- Login
- View Project Schedule
- Suggest Successful Students for Scholarship
- Suggest Successful Students for Projects
- Provide Feedback
- Add Student
- Perform E-Mail Operations
- Perform Message Operations
- Edit Profile

Diagram:

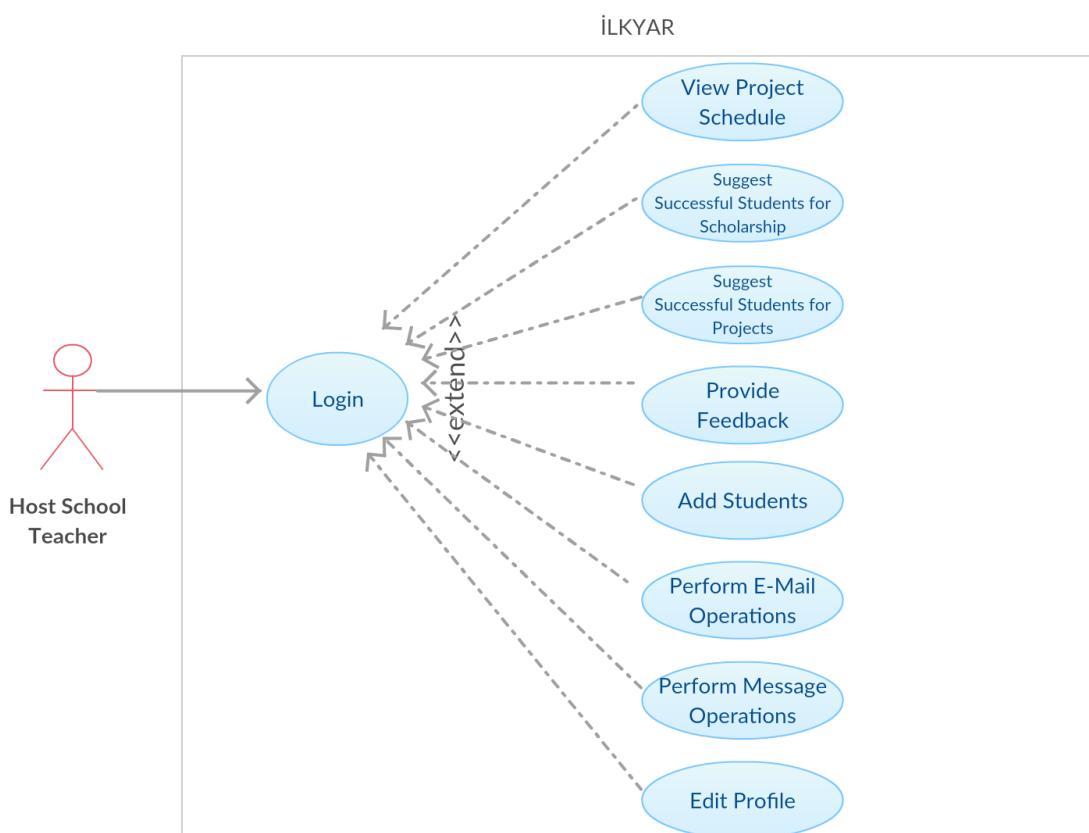


Figure 9 Use case diagram of Host School Teacher.

Brief Description:

Host School Teacher use case diagram (Figure 9) explains the main operations that a Host School Teacher can perform when s/he logs in to the system. Host School Teacher can perform functions such

that view activity list and schedule, suggest successful students for scholarship, suggest successful students for projects, provide feedback, perform e-mail operations, perform message operations and edit his/her profile.

Initial Step by Step Description:

1. Host School Teacher should enter the system with login.
 - 1.1. If the password is invalid for the user name, Host School Teacher must re-login.
 - 1.2. Host School Teacher can view activity list and schedule that belongs to his/her school.
 - 1.3. Host School Teacher can suggest successful students for scholarship.
 - 1.4. Host School Teacher can suggest successful students for projects.
 - 1.5. Host School Teacher can provide feedback for projects that took part in.
 - 1.6. Student can perform e-mail operations.
 - 1.7. Student can perform message operations using message service in system.
 - 1.8. Student could edit his/her profile as s/he wishes.

3.4.2.10. Student

Use Case:

- Login
- List Scholarship Options
- Apply for Scholarship(extend)
- Provide Feedback
- Perform E-Mail Operations
- Perform Message Operations
- Edit Profile

Diagram:

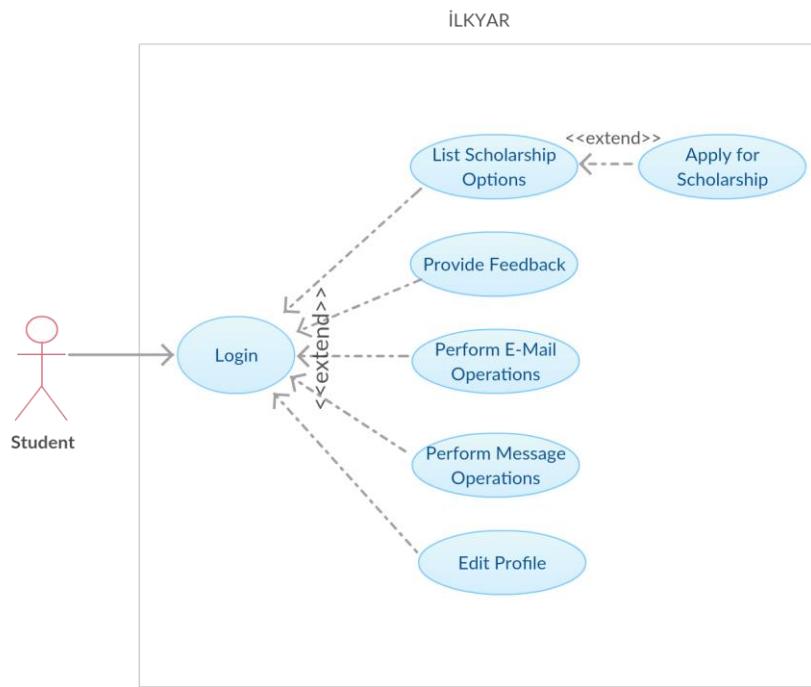


Figure 10 Use case diagram of Student.

Brief Description:

Student use case diagram (Figure 10) explains the main operations that a student can perform when s/he logsins to the system. Student can perform functions such that list scholarship options, apply for scholarship, provide feedback, perform e-mail operations, perform message operations and edit his/her profile.

Initial Step by Step Description:

1. Student should enter the system with login.
 - 1.1. If the password is invalid for the user name, student must re-login.
 - 1.2. Student can list the scholarship options that s/he desires to apply.
 - 1.3. Student can apply for any scholarship option.
 - 1.4. Student can provide feedback for projects that took part in.
 - 1.5. Student can perform e-mail operations.
 - 1.6. Student can perform message operations using message service in system.
 - 1.7. Student could edit his/her profile as s/he wishes.

3.4.3. Performance Requirement

I-NGO Project aims to support at least 50 users' usage simultaneously without any error occurred.

3.4.3.1. Software System Attributes

3.4.3.1.1. Portability

The system could be used both in Web, Android and iOS platforms. The minimum operating system requirements are Windows 7, Windows 8.1 or later, Windows 10 on Web; Android 9.0 Pie and later versions and iOS 12.0 and later versions

3.4.3.1.2. Usability

The system is developed as user-friendly interface. Hence, every user at each category can use the system efficiently. Thus, thanks to the reminders; user could perform actions easily.

3.4.3.1.3. Safety Requirement

Since the system contains a payment system for scholarship/donation activities, the users should be careful about data security.

4. SOFTWARE DESIGN

4.1. INTRODUCTION

NGOs are non-profit and voluntariness-based groups organized in the fields of social development, human rights and the environment at different levels such local, national or international. In spite of the fact that they share a few attributes with state and private sector organizations, NGOs have particular organizational features. They manage relationships with various actors, run different projects and face special challenges. At this point, NGO management differs from business management and public-sector administration. Management of NGOs is complex in terms of design and implementation of such systems. This project aims to develop a ***non-profitable NGO (Non-Governmental Organization) management system*** by developing client interfaces and efficient-multi server implementations. This document indicates the software design of the project. In the “Architecture Design” section, design approach is discussed and the project’s work plan is indicated. In addition, mockups of the system are designed and explained in this report.

4.1.1. Purpose

The aim of Software Design Document is to provide details of Intelligent NGO (I-NGO) Management System Project. This project is designed for ILKYAR, which is an NGO serves an education era in Turkey. The system implementation is expected to be in the form of a server-client model in the form of a cloud service. The system controls volunteer membership (join/leave), participation request for a particular project, approval of participation, project details and schedule, etc. There are several client

roles and each needs a different interface. Each interface and properties of the system are designed and explained in this report.

4.1.2. Scope

I-NGO management system is a server-client model system in the form of a cloud service. Its purpose to ease NGOs management system and make them run their all processes via this software. Functions specified according to participants. Each participant needs different interfaces. This report indicates designs, which are categorized by functions. Client could be mobile (IOS, Android) as well immobile (desktop or laptop). Thus, three type of designs such Web, Android and iOS demonstrated in the report.

4.1.3. Glossary

Table 7 SDD Glossary

Term	Definition
NGO	Non-Governmental Organization (NGO) is a citizen-based association that works independently of the government and is often used to provide resources or to serve certain social or political purposes [68].
I-NGO Management System	It is a server-client model system in the form of a cloud service, controlling participant activities such as volunteer membership (join/leave), participation request for a particular project, approval of participation, project details and schedule, etc.
Intelligent System	Technologically advanced machines that can perceive their environment, interact with users via interfaces and react to the world around them [69].
ILKYAR	It is an NGO serves an education era in Turkey.
Participant	A user interacts with the interfaces.
Interface	It is the program, which enables user to interact with a computer [70].

4.2. ARCHITECTURE DESIGN

4.2.1. I-NGOS Design Approach

I-NGOS Project is developed using Scrum methodology; since, it provides better scheduling and controlling of the project. To apply an agile methodology, it is enough to understand the proper perspective of the system design. Then, details should be divided into aspects. Incremental design reduces the cost of changes. This method emphasizes real-time communication and face-to-face

discussion with NGO. Besides, as the NGO is on site, team gets feedback instantly so, identifies the areas for improvement and can revise their practices, so continuous integration and tests are provided. Scrum process helps the NGO to enlarge the quality of software, expect and manage better with changes, render better predictions while spending less time to form software, control the project schedule and state easily. High value features are evolved and delivered to NGO quickly with short cycles. Team members enjoy work, since the nonproductive work reduced, and see their work valued and used which increases their motivation. Scrum makes alignment of development work and NGO's needs easier by re-prioritizing work frequently, to ensure maximum valued delivery. Besides, it helps to monitor the project easily, catch and address the issues quickly. The meetings are scheduled weekly with the project advisors. Team members communicate with each other daily (around 15 mins) to figure out the information flow. Scrum methodology has 3 main roles which provides the work balance between project members. The Product Owner is responsible for the vision of a product, the gathering and the prioritization of the requirements, control over the budget and the ROI [71]. Scrum master is known as guardian of Scrum Team, someone that resolves impediment and have control over the scrum processes [69]. Therefore, Scrum Team is the team that develops the project. Therefore, to manage project better; a desktop Scrum application MeisterTask is used as in Figure 11 and 12. Hence, to do lists, in progress tasks, done tasks are determined obviously thanks to the application. During the project, the tasks are divided into sprints and all of these sprints form sprint backlogs. Feedbacks are given at the end of each sprint by the project advisors. Then, to observe the enhancements intentionally the scrum board structure is being observed. On this board, each column reflects the level of each sprint. To illustrate, "To Do" column refers to the all sprints that has not started yet. The "In Progress" column refers to the sprints that are still handling. And the third column "Done" yields to the completed sprints. By using this technique, the flow of the project could be observed simultaneously, and continuous improvement is operated successfully. The sprints are determined such as

- Sprint-1
 - Literature Review
 - Project Workplan
 - Test & Release
- Sprint-2
 - SRS Identification
 - SDD-Use Cases
 - SDD-Mockups
 - Test & Release

- Sprint-3
 - SDD - Mockups
 - Project Webpage
 - UML Diagrams
 - Test & Release
- Sprint-4
 - SDD - Mockups
 - UML Diagrams
 - Editing Project Webpage
 - TÜBİTAK Application
 - Project Report
 - Test & Release

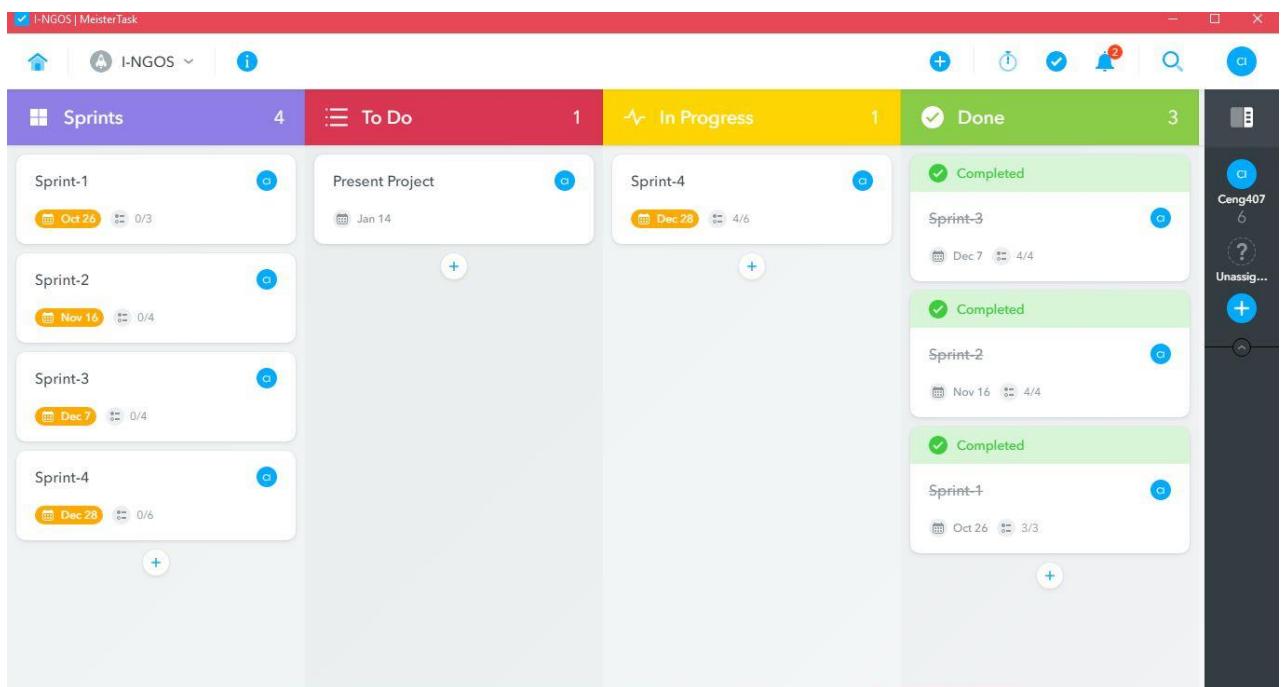


Figure 11 MeisterTask usage as Scrum Board.

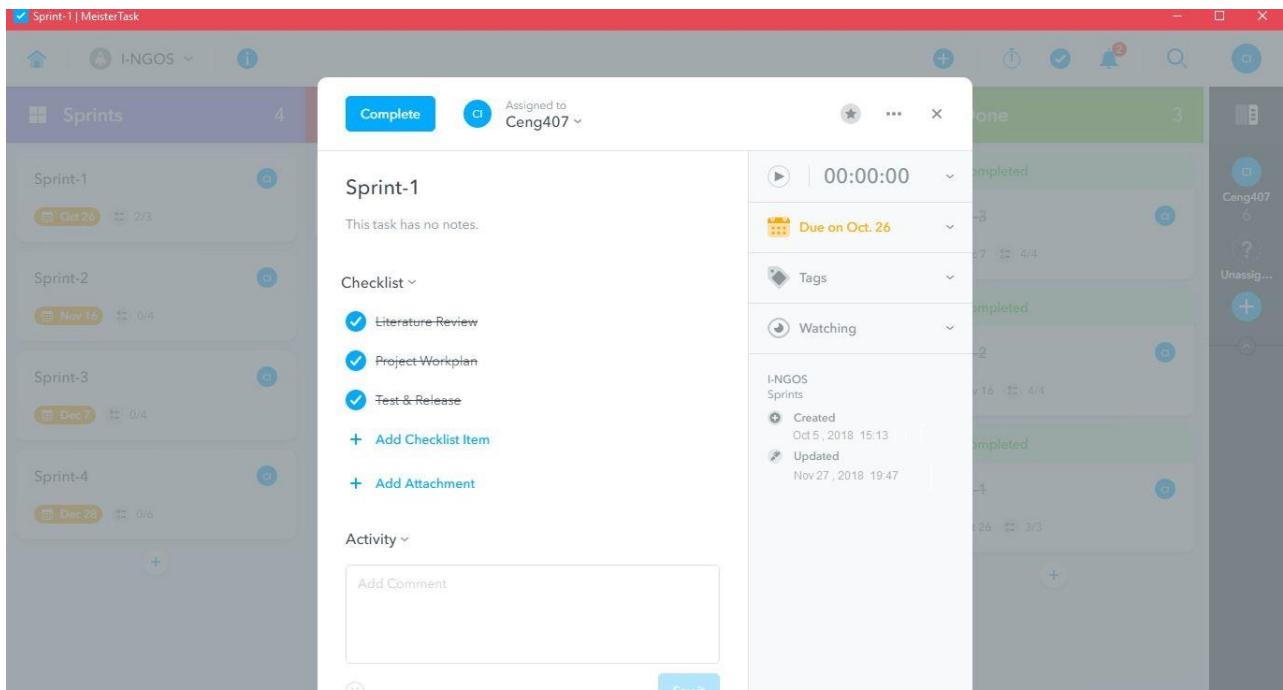


Figure 12 Script detail example on Scrum Board

On the Gantt chart below, the work plan of the project is reflected for only CENG-407 content. According to the Gantt chart the busiest section is the SDD part; since, the designs of Web, Android and iOS platforms were accomplished on Balsamiq Mockups. Each detail and user functions that specified in SRS were handled on mockup designs. After completing the modeling phase, test and release operations were done at the end of each sprint. Since Scrum methodology is used in the project, planning, modeling, testing and releasing are crucial steps that were handled.

Start Date: 30/09/2018	8.10.2018-14.10.2018	15.10.2018-21.10.2018	22.10.2018-28.10.2018	29.10.2018-04.11.2018	5.11.2018-11.11.2018	12.11.2018-18.11.2018	19.11.2018-25.11.2018	26.11.2018-02.12.2018	03.12.2018-09.12.2018	10.12.2018-16.12.2018	17.12.2018-23.12.2018	24.12.2018-30.12.2018	31.12.2018-06.01.2019
CENG-407	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10	WEEK 11	WEEK 12	WEEK 13
Literature Review													
Research	■												
Evaluate researches	■												
Conclude		■											
Software Requirements Specification													
Identify SRS			■										
Develop Use Cases			■										
Evaluate & Edit SRS				■	■								
Project Webpage													
Specify general Webpage concept							■						
Develop the Webpage							■						
Software Design Description													
Develop Mockups for Web				■	■	■	■						
Develop Mockups for Android & iOS				■	■	■	■						
Test & Release							■						
Specify UML Diagrams							■						
Create UML Diagrams							■						
Evaluate and Edit SDD							■	■					
Test & Release								■	■				
Project Report													
Edit Project Report									■	■			
Presentation													
Prepare Presentation										■	■	■	PRESENTATION

Figure 13 Work Plan of the project

4.2.1.1. Class Diagram

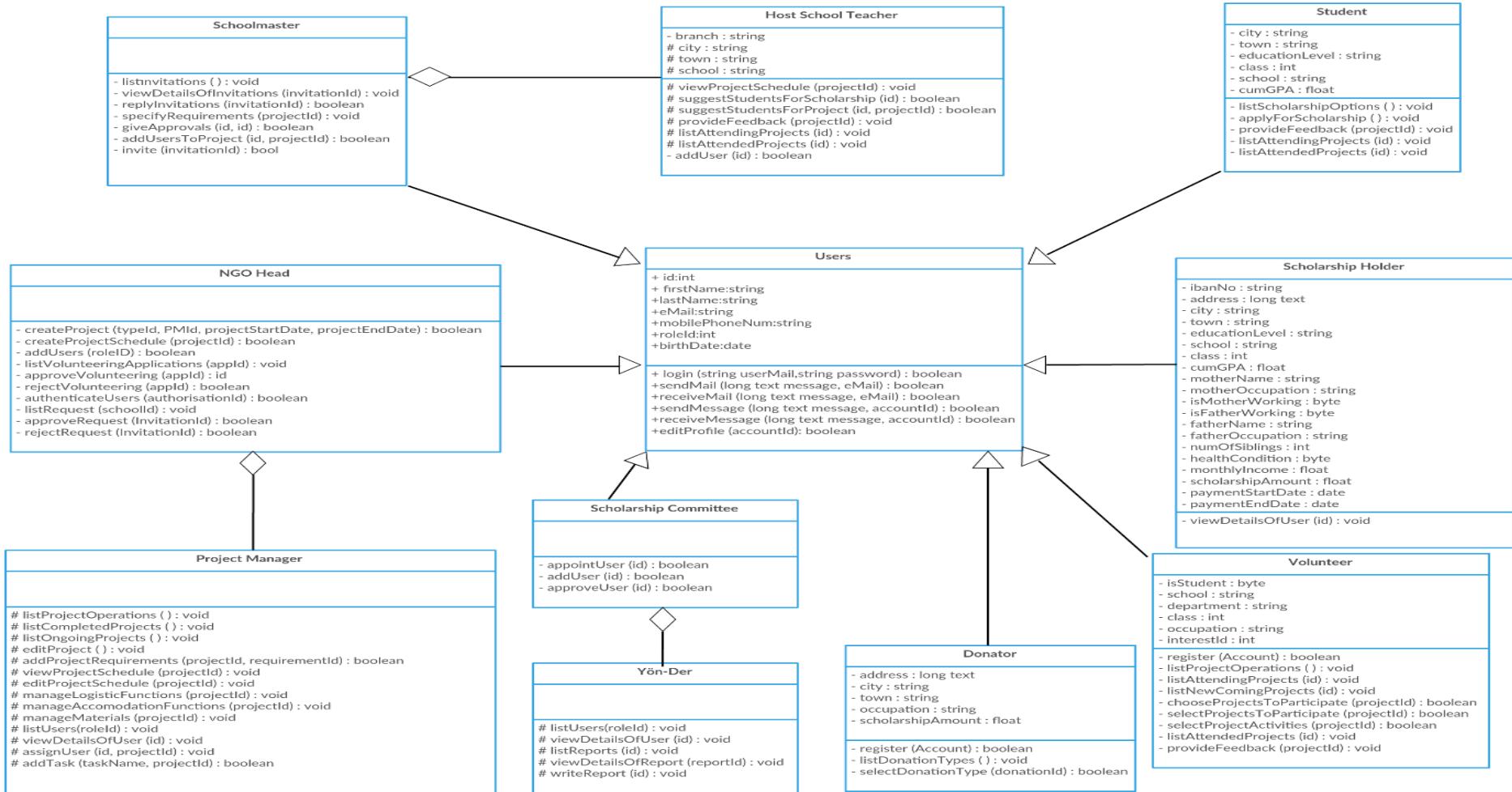


Figure 14 Class Diagram of the system

Figure 14 mainly illustrates that the class diagram of the system in terms of each type of users defined. To hold the common qualifications, “Users” class is defined. The “Users” class includes common attributes and operations for each type of user; so, they are written as public; since, these class attributes and operations are accessible from other classes. By using inheritance property, NGO Head, Scholarship Committee, Donator, Volunteer, Scholarship Holder, Schoolmaster and Student are directed from Users class. However, Project Manager, Yön-Der and Host School Teacher is directed from NGO Head, Scholarship Committee and Schoolmaster separately; since, they have an aggregation property. To illustrate, NGO Head can do every function that Project Manager can do and also it is same for Scholarship Committee – Yön-Der and Schoolmaster – Host School Teacher. The operations for Project Manager, Yön-Der and Host School Teacher (except Host School Teacher’s last operation) are written as protected; since, these class attributes and operations are accessible from the same class or from classes derived from them. Other classes such as NGO Head, Scholarship Committee, Donator, Volunteer, Scholarship Holder, Schoolmaster and Student’s class attributes and operations are written as private; since, they are only accessible from inside the class.

4.2.2. I-NGOS Interfaces

4.2.2.1. Profile Management

Summary: Profile management allows users to control their accounts. All users use profile management to login shown in Figure 15 for web and Figure 16 for Android/iOS, update personal information shown in Figure 17 and Figure 18-20 for Android/iOS and exit from the system.

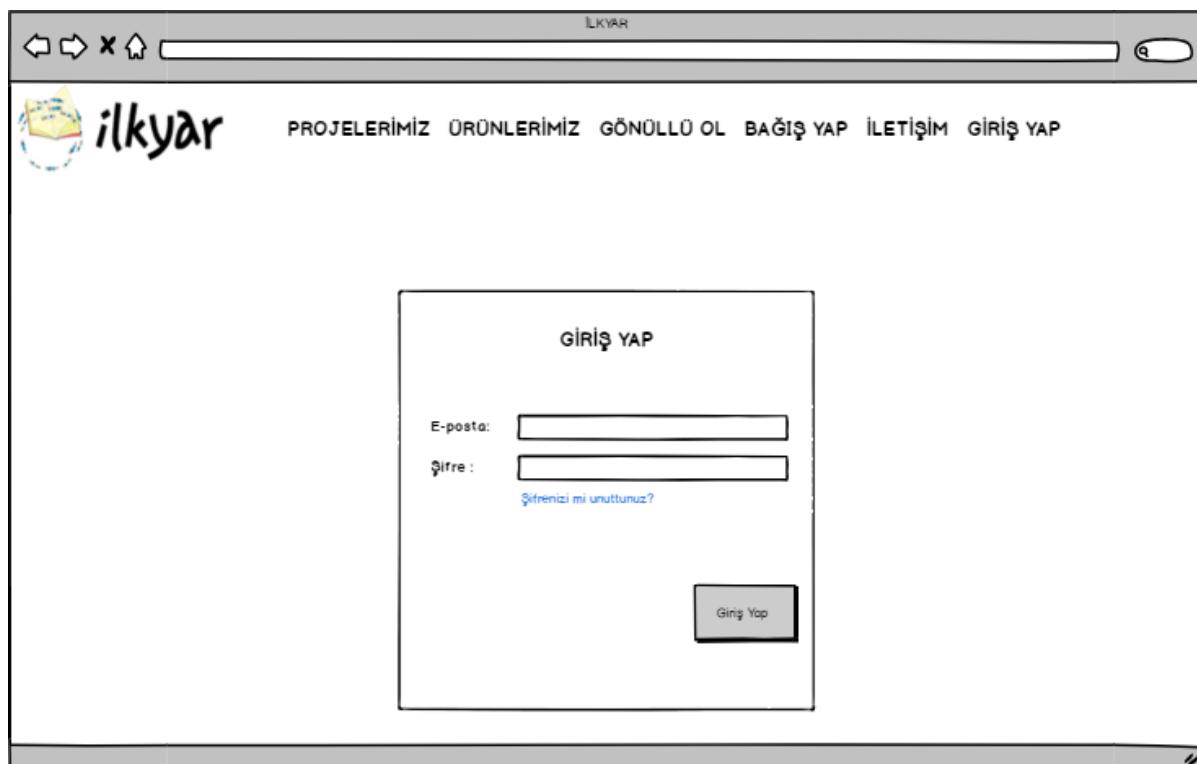


Figure 15 Login for Web platform



Figure 16 Login for Android/iOS platform

A Web Page

<https://>



ilkyar

YÖNDERİM MESAJ PROFİL

Deniz Kaya
denizkaya@hotmail.com

 Transkript Yükle
 Öğrenci Belgesi Yükle

Ad	Deniz	Not Ortalaması	87,5
Soyad	Kaya	Anne Adı	Meltem
Doğum Tarihi	23.01.2001	Annesinin Mesleği	Ev Hanımı
Cep Telefonu	0532 147 25 36	Baba Adı	Kemal
Hesap No	TH00000000000000	Babasının Mesleği	Serbest Meslek
Yön-Der	Anıl Kılıç	Kardeş Sayısı	2
E-Posta	denizkaya@hotmail.com	Şağlık Durumu	Engelli Yok
Adres	Mustafa Kemal Mahallesi.....	Aile Aylık Geliri(TL)	2200
İl	Ankara	Burs Miktarı(TL)	300
İlçe	Çankaya	Burs Baş.Tarihi	23.01.2015
Eğitim Seviyesi	Lise	Burs Bit. Tarihi	23.01.2019
Sınıf	3		
Okul Adı	Atatürk Lisesi		

Figure 17 Personal Information for Web platform

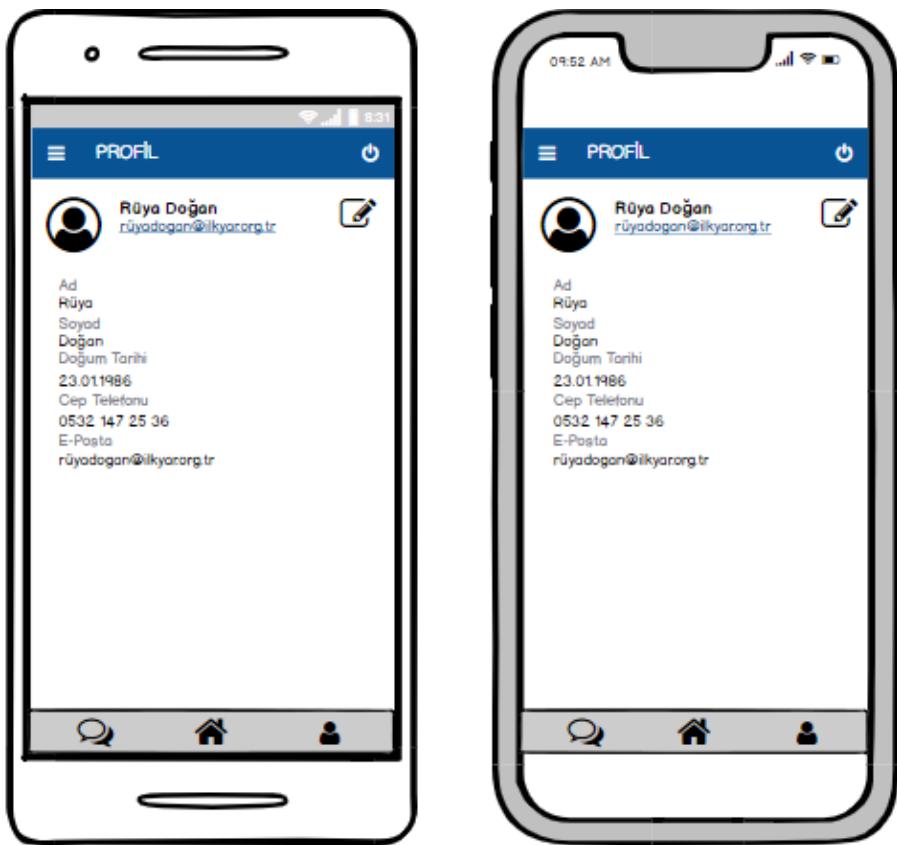


Figure 18 Personal Information for Android/iOS platform

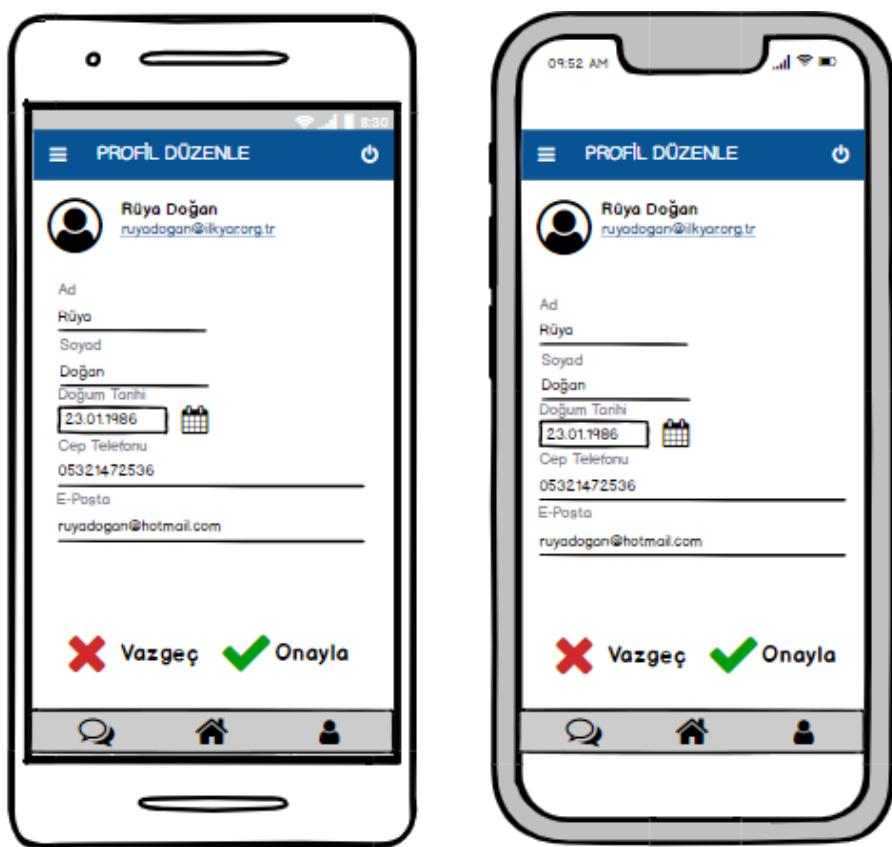


Figure 19 Personal Information for Android/iOS platform (cont'd)

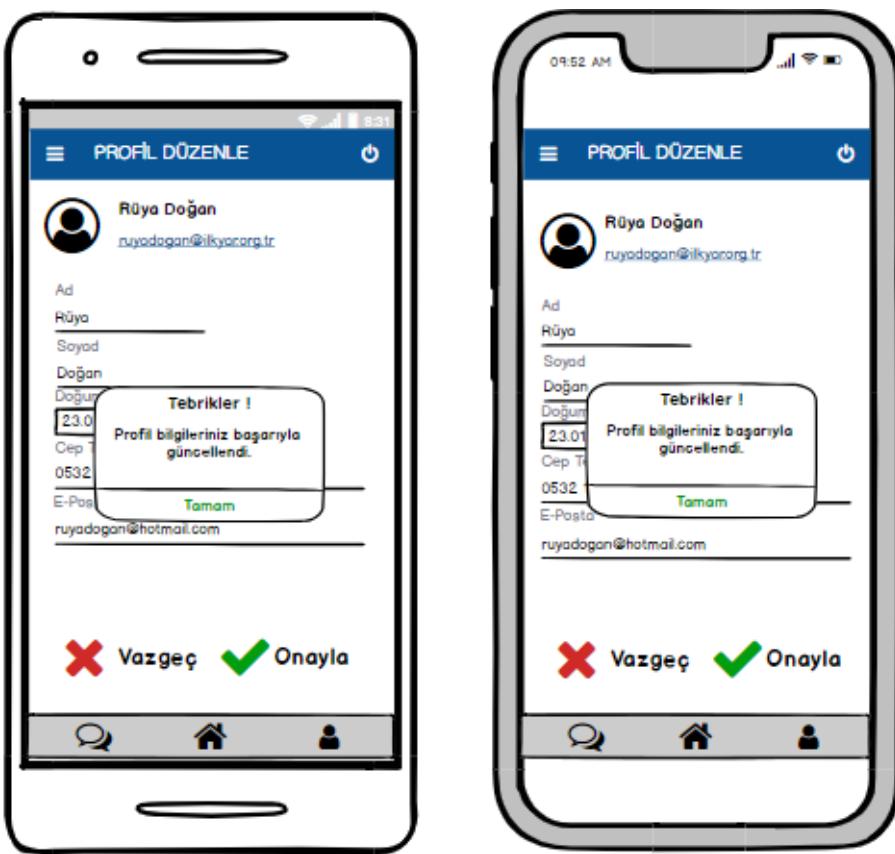


Figure 20 Personal Information for Android/iOS platform (cont'd)

This management system differs slightly due to user role. NGO head adds users such project manager, scholarship committee, scholarship holder, Yön-Der, schoolmaster, host schoolteachers and students. Its interface shown in Figure 21 and Figure 22 for Android/iOS.

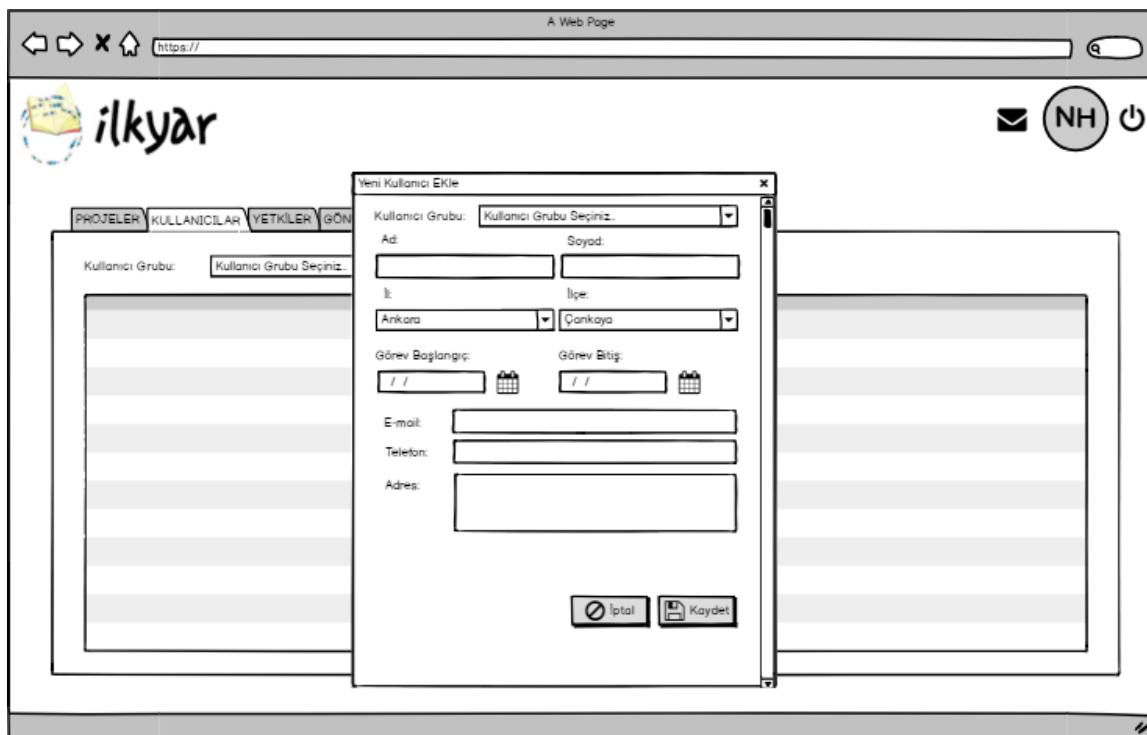


Figure 21 Add User for Web platform

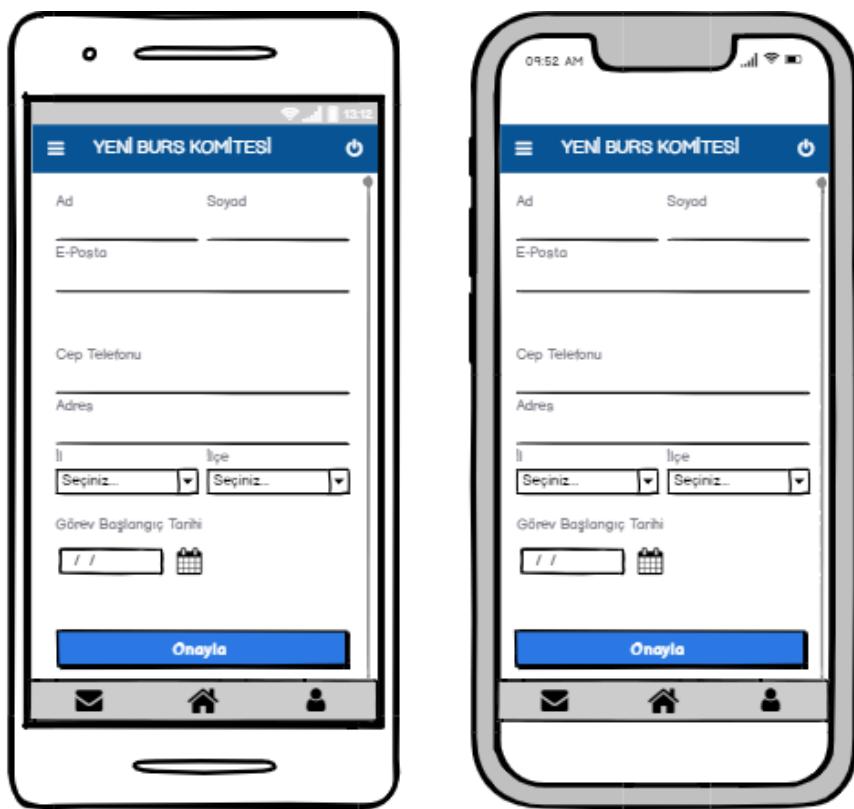


Figure 22 Add User for Android/iOS

On the other hand, volunteers need to apply for volunteering. NGO head is able to see the applications and approve them, thus, volunteers are registered the system. Besides, donators register the system.

Actor: NGO head, project manager, scholarship committee, scholarship holder, Yöneter, schoolmaster, host schoolteachers, students, volunteer, donator.

Precondition: User must have a stable internet connection and visit the webpage or run the application.

Basic Sequence for Web:

1. If user is donator and does not have an account, s/he registers. If user is volunteer and does not have an account, s/he applies for volunteering.
 - a. If volunteer applies for volunteering NGO head should approve volunteering request.
2. User logins to the system by entering her/his username and password.
3. User is able to see her/his personal information by clicking “Profile” button placed at the right upper corner of the webpage.
4. NGO head can list users by clicking “Kullanıcılar” tab, choosing user group and clicking “Listele” button.
5. NGO head is able to add users by clicking “Ekle” button placed in “User” tab.
6. User can exit from the system by clicking “Çıkış” button located at the right upper corner of the page.

Basic Sequence for Android/iOS:

1. If user is donator and does not have an account, s/he registers. If user is volunteer and does not have an account, s/he applies for volunteering.
 - a. If volunteer applies for volunteering NGO head should approve volunteering request.
2. User logins to the system by entering her/his username and password.
3. User is able to see her/his personal information by clicking “Profile” button placed at the options menu.
4. NGO head can list users by clicking “Kullanıcılar” button, choosing user group and clicking “Listele” button.
5. NGO head is able to add users by clicking “Ekle” button placed in “Users” page.
6. User can exit from the system by clicking “Çıkış” button located at the option menu.

Exception: Database connection can fail.

Post Conditions: None.

Priority: Low.

4.2.2.2. Project Management

Projects are the most important part of I-NGO management system. Project management consists of creating, editing and displaying project functions. Users manage projects by the ‘Projeler’ button shown in Figure 23 for Web platform and Figure 24 for Android/iOS platform. This button leads to “Projeler” tab shown in Figure 25 for Web platform and “Projeler” menu in Android/iOS platform shown in Figure 26. Sub-tabs depends on the user type, since not all of the users are able to create or update projects.

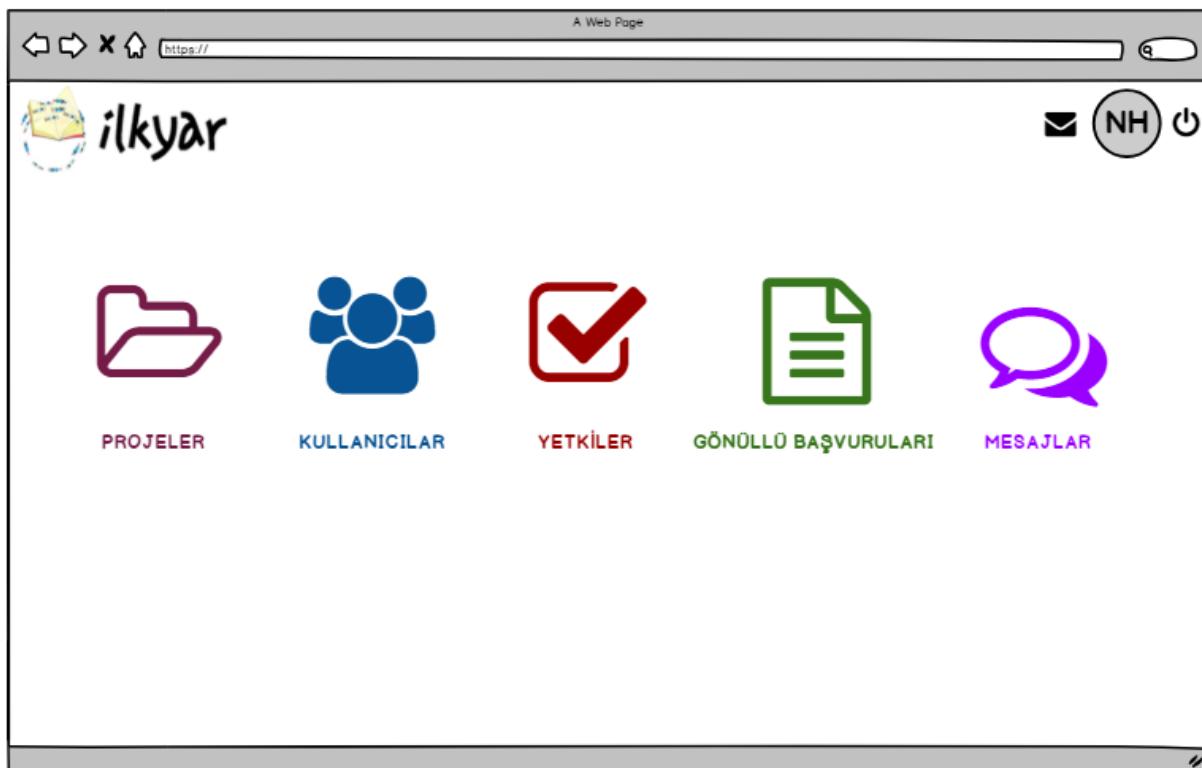


Figure 23 Main page of NGO Head for Web platform



Figure 24 Main page of NGO Head for Android/iOS platform

Figure 25 "Projeler" tab for Web platform



Figure 26 "Projeler" menu

4.2.2.2.1. Creating a Project

Summary: User can create a new project and add details. Interfaces for creating a project function shown in Figure 27 and Figure 28. Details are added via pop-up screen at Web platform (Figure 29-30). At Android/iOS platform, details are added via new window shown in Figure 31-33.

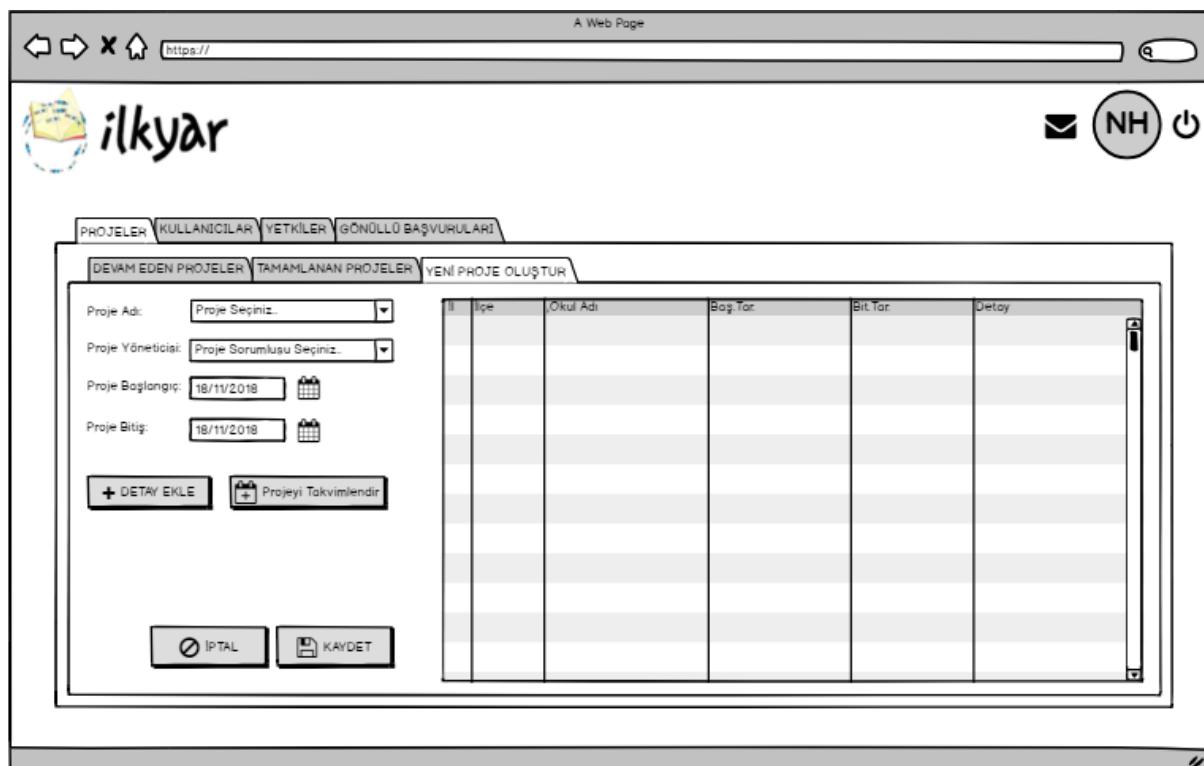


Figure 27 Create a project at Web platform



Figure 28 Create a project at Android/iOS platform

Actor: NGO Head

Precondition: User must login to the system and click on “Projeler” button then, ““Proje Oluştur” tab.

Basic Sequence for Web platform:

- 1) The user must login to the system with related e-mail and password information.
- 2) User must click on button “Projeler”.
- 3) User must click “Proje Oluştur” tab.
- 4) User must choose the project name from the combo box.
- 5) User must choose project manager from the combo box.
- 6) User must choose project start and end date from the date chooser.
- 7) User must save the project.

Exception: None

Post Conditions: After saving project, project should transferred to the ongoing projects list by the system automatically.

Priority: High

Basic Sequence for Android/iOS platform:

- 1) The user must login to the system with related e-mail and password information.
- 2) User must click on button “Projeler”.
- 3) User must click “Proje Oluştur” button.
- 4) User must choose the project name from the combo box.
- 5) User must choose project manager from the combo box.
- 6) User must choose project start and end date from the date chooser.
- 7) User must save the project.

Exception: None

Post Conditions: After saving project, project should transferred to the ongoing projects list by the system automatically.

Priority: High

4.2.2.2. Adding Details to Project

Summary: User can add details via pop-up screen at Web platform (Figure 29-30). At Android/iOS platform, details are added via new window shown in Figure 31-33.

The screenshot shows a web browser window titled "A Web Page" with the URL <https://>. The main content is a form titled "Proje Detay Ekle". The form has several sections:

- Top Section:** Includes fields for "İl: [Seçiniz...]", "İlçe: [İlçe Seçiniz...]", "Okul: [Okul Seçiniz...]", "Başlangıç: 18/11/2018", "Bitiş: 18/11/2018", and two calendar icons.
- Yapılacak Etkinlikler (Activities):** A table with columns "ETKINLIK" and "SORUMLU KİŞİ". It contains one row with "Drama" in the first column and an empty second column.
- Malzemeler (Materials):** A table with columns "MALZEME" and "MALZEME ÇEVİSİ". It contains one row with empty columns.
- Adet (Quantity):** A dropdown menu set to "3".
- Ulaşım Detayları (Travel Details):** Includes fields for "Gidiş Tarihi: 18/11/2018" and "Dönüş Tarihi: 18/11/2018", both with calendar icons. There are also checkboxes for "Oto" and "Uçak".
- Konaklama Detayları (Accommodation Details):** Includes a field "Yer: []" and a dropdown "Kişi sayısı: 3".

Figure 29 Add details at Web platform

Figure 30 Add details at Web platform (cont'd)



Figure 31 Add details at Android/iOS platform



Figure 32 Add details at Android/iOS platform (cont'd)



Figure 33 Add details at Android/iOS platform (cont'd)

Actor: NGO Head, Project Manager

Precondition: User must login to the system and click on “Projeler” button then, ““Proje Oluştur” tab or “Devam Eden Projeler” tab and “Düzenle” button.

Basic Sequence for Web platform:

- 1) The user must login to the system with related e-mail and password information.
- 2) User must click on button “Projeler”.
- 3) If user wants to create a new project and add details, user should follow the basic sequence for creating project, then click “Detay Ekle” button to add details. User must choose the project name from the combo box.
- 4) If user wants to add details to ongoing projects, user should click on “Devam Eden Projeler” tab, and then click on “Düzenle” button.
- 5) User must choose city from the combo box.

- 6)** User must choose district from the combo box.
- 7)** User must choose school from the combo box.
- 8)** User must choose detail start and end date from the date chooser.
- 9)** User may add activities from the combo box.
- 10)** User may add materials from the combo box.
- 11)** User may add transportation details by choosing departure and arrival time from the date chooser.
 - a.** User must choose the transportation tab and type related information to related input box.
- 12)** User may add accommodation details by typing the inn's name to input box.
 - a.** User must enter the number of people who will benefit accommodation.
- 13)** User may add notes.
- 14)** User must save the project.

Exception: None

Post Conditions: None

Priority: High

Basic Sequence for Android/iOS platform:

- 1)** The user must login to the system with related e-mail and password information.
- 2)** User must click on button “Projeler”.
- 3)** If user wants to create a new project and add details, user should follow the basic sequence for creating project, then click “Detay Ekle” button to add details. User must choose the project name from the combo box.
- 4)** If user wants to add details to ongoing projects, user should click on “Devam Eden Projeler” tab, and then click on “Düzenle” button.
- 5)** User must choose city from the combo box.
- 6)** User must choose district from the combo box.
- 7)** User must choose school from the combo box.

- 8) User must choose detail start and end date from the date chooser.
- 9) User may add activities from the combo box.
- 10) User may add materials from the combo box.
- 11) User may add transportation details by choosing departure and arrival time from the date chooser.
 - a. User must choose the transportation tab and type related information to related input box.
- 12) User may add accommodation details by typing the inn's name to input box.
 - a. User must enter the number of people who will benefit accommodation.
- 13) User may add notes.
- 14) User must save the project.

Exception: None

Post Conditions: None

Priority: High

4.2.2.2.3. Editing Project

Summary: User can edit a project and add details. Interfaces for editing a project function shown in Figure 34 and Figure 35. Details are added via pop-up screen at Web platform shown above in Figure 29-30. At Android/iOS platform, details are added via new window shown above in Figure 31-33.

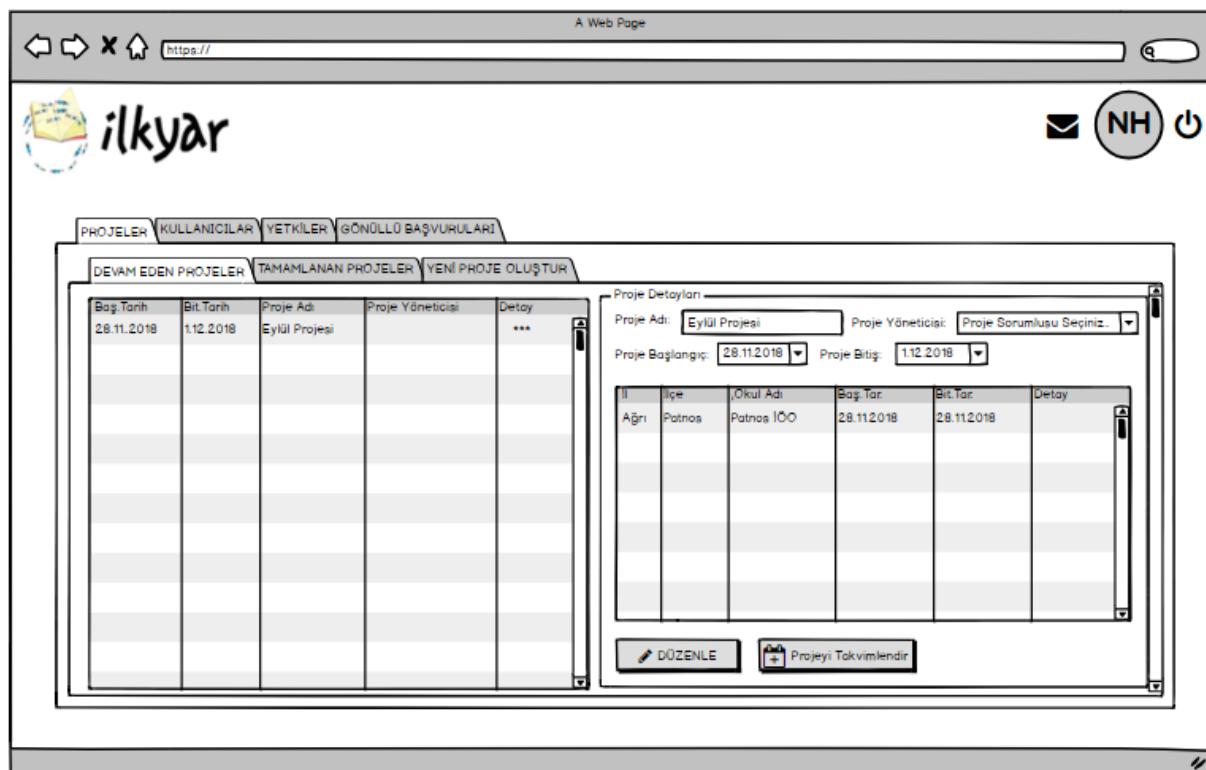


Figure 34 Edit project at Web platform



Figure 35 Edit project at Android/iOS platform

Actor: NGO Head, Project Manager

Precondition: User must login to the system and click on “Projeler” button then, “Devam Eden Projeler” tab.

Basic Sequence for Web platform:

- 1) The user must login to the system with related e-mail and password information.
- 2) User must click on button “Projeler”.
- 3) User must click “Devam Eden Projeler” tab.
- 4) User is able to choose the project from the grid to see its details on the right side as shown in Figure 24.

Exception: None

Post Conditions: After saving project, project should transferred to the ongoing projects list by the system automatically.

Priority: High

Basic Sequence for Android/iOS platform:

- 1) The user must login to the system with related e-mail and password information.
- 2) User must click on button “Projeler”.
- 3) User must click “Devam Eden Projeler” button.
- 4) User can click “Düzenle” to choose the project from the grid to see its details.
- 5) User is able to add new details to the project.

Exception: None

Post Conditions: After saving project, project should transferred to the ongoing projects list by the system automatically.

Priority: High

4.2.2.4. Displaying Project

Summary: User can edit a project and add details. Interfaces for editing a project function shown in Figure 36 and Figure 37. Details are added via pop-up screen at Web platform shown above in Figure 29-30. At Android/iOS platform, details are added via new window shown above in Figure 31-33.

A Web Page

https://

ilkyar

PROJELER KULLANICILAR YETKILER GÖNÜLLÜ BAŞVURULARI

DEVAM EDEN PROJELER TAMAMLANAN PROJELER YENİ PROJE OLUŞTUR

Baş.Tarih	Bit.Tarih	Proje Adı	Proje Yöneticisi	Detay
28.11.2018	1.12.2018	Eylül Projesi		***

Proje Detayları

Proje Adı: Proje Yöneticisi:

Proje Başlangıç: Proje Bitiş:

Ağrı	İlçe	Okul Adı	Baş.Tar	Bit.Tar	Detay
	Patnos	Patnos İOO	28.11.2018	28.11.2018	***

Figure 36 Display project at Web platform



Figure 37 Display project at Android/iOS platform

Actor: NGO Head, Project Manager, Volunteer

Precondition: User must login to the system and click on “Projeler” button then, “Tamamlanan Projeler” tab.

Basic Sequence for Web platform:

- 1) The user must login to the system with related e-mail and password information.
- 2) User must click on button “Projeler”.
- 3) User must click “Tamamlanan Projeler” tab.
- 4) User is able to choose the project from the grid to see its details on the right side as shown in Figure 36.

Exception: None

Post Conditions: After saving project, project should transferred to the ongoing projects list by the system automatically.

Priority: High

Basic Sequence for Android/iOS platform:

- 1) The user must login to the system with related e-mail and password information.
- 2) User must click on button “Projeler”.
- 3) User must click “Tamamlanan Projeler” button.
- 4) User can click “Detay” to choose the project from the grid to see its details.

Exception: None

Post Conditions: After saving project, project should transferred to the ongoing projects list by the system automatically.

Priority: High

4.2.2.5. Feedback Mechanism Management

Summary: User can give feedback to projects that s/he took placed.

A Web Page

The screenshot shows a web-based feedback interface. At the top right, there is a logo with 'ilkyar' and five stars. On the right side, there are icons for email, a user profile, and a power symbol. Below the header, there are two buttons: 'PROJELER' and 'GERİ BİLDİRİM VER'. A dropdown menu labeled 'Proje Adı:' is open, showing 'Proje Seçiniz.' with a dropdown arrow. The main area contains five statements with five-star rating scales next to them. To the right of each statement is a text input field for suggestions. At the bottom right are two buttons: 'İptal' and 'Gönder'.

Figure 38 Feedback interface for Web platform

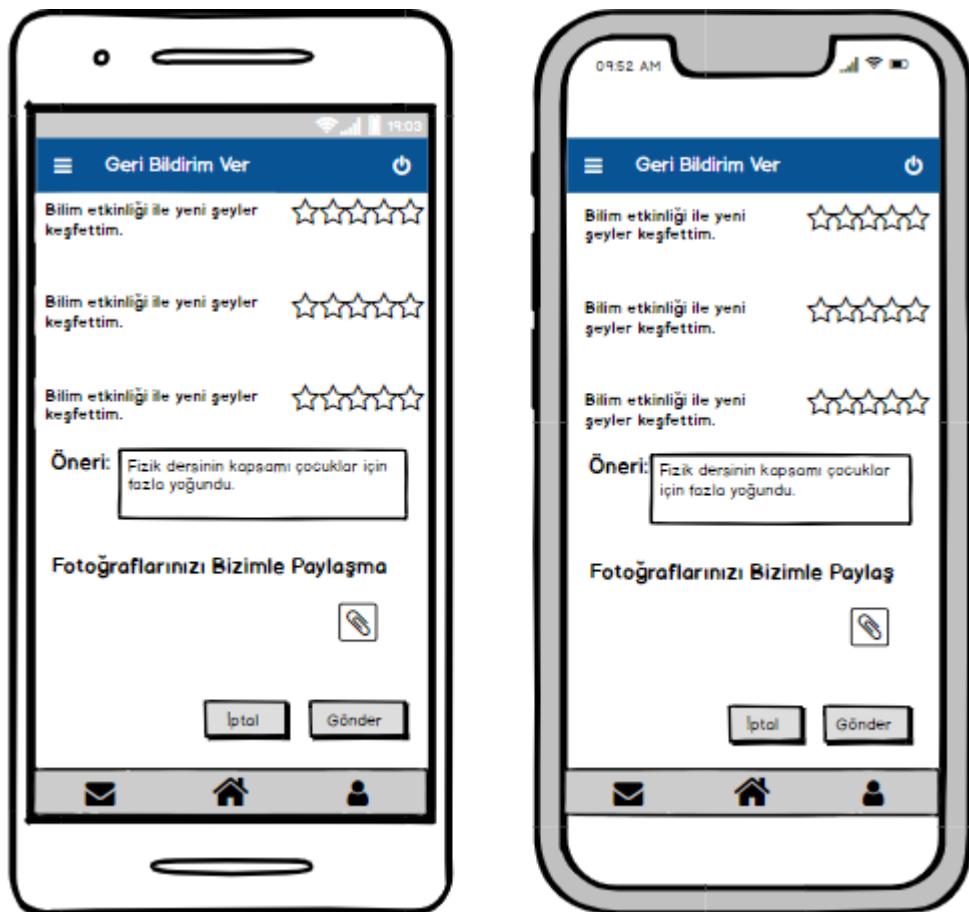


Figure 39 Feedback interface for Android/iOS platform

Actor: Volunteer, Student

Precondition: The user must login to the system and click on “Geri Bildirim Ver” button. This button leads a feedback page, which are shown in Figure 38 and Figure 39 for different platforms.

Basic Sequence for Web:

- 1) The user must login to the system with related e-mail and password information.
- 2) User must click on button “Geri Bildirim Ver”.
- 3) User must choose the project.
- 4) User needs to give feedbacks to questions.
- 5) User may add a note.
- 6) User must save the feedback or is able to cancel.

Exception: None

Post Conditions: None

Priority: Medium

Basic Sequence for Android/iOS platform:

- 1) The user must login to the system with related e-mail and password information.
- 2) User must click on button “Geri Bildirim Ver”.
- 3) User must choose the project.
- 4) User needs to give feedbacks to questions.
- 5) User may add a note.
- 6) User must save the feedback or is able to cancel.

Exception: None

Post Conditions: None

Priority: Medium

4.2.2.3. Communication Management

4.2.2.3.1. Communication via Message

Summary: User can receive and send messages via message tab inside the application.

Actor: All users.

Precondition: The user must login to the system and click on “MESAJ” tab. If s/he would like to write new message, s/he must choose the user group first as it is shown in Figure 40 for Web and Figure 45 for Android and iOS. Then, the person whom the message is sent must be selected to write the message which is illustrated in Figure 41 for Web and Figure 46 for Android and iOS. After the writing the message, it is sent by clicking on “Gönder” button in Figure 42 for Web and Figure 47-48 for Android and iOS. If the user wants to see details of conversation, s/he should view them at the “Sohbetlerim” section in Figure 43 and 44 for Web, Figure 49-50-51-52 for Android and iOS.

Basic Sequence:

- 1) The user must login to the system with related e-mail and password information.
- 2) The user must click on the “MESAJ” tab.
- 3) If the user wants to send new message, s/he must select the user group at first.
- 4) Then, the person should be selected.
- 5) After typing the message, s/he must send the message by clicking the “Gönder” button.
- 6) If the user wants to see the conversation details, s/he can see them at the “Sohbetlerim” section.

Exception: None

Post Conditions: After sending the message, “Sohbetlerim” section should be re-organized.

Priority: High

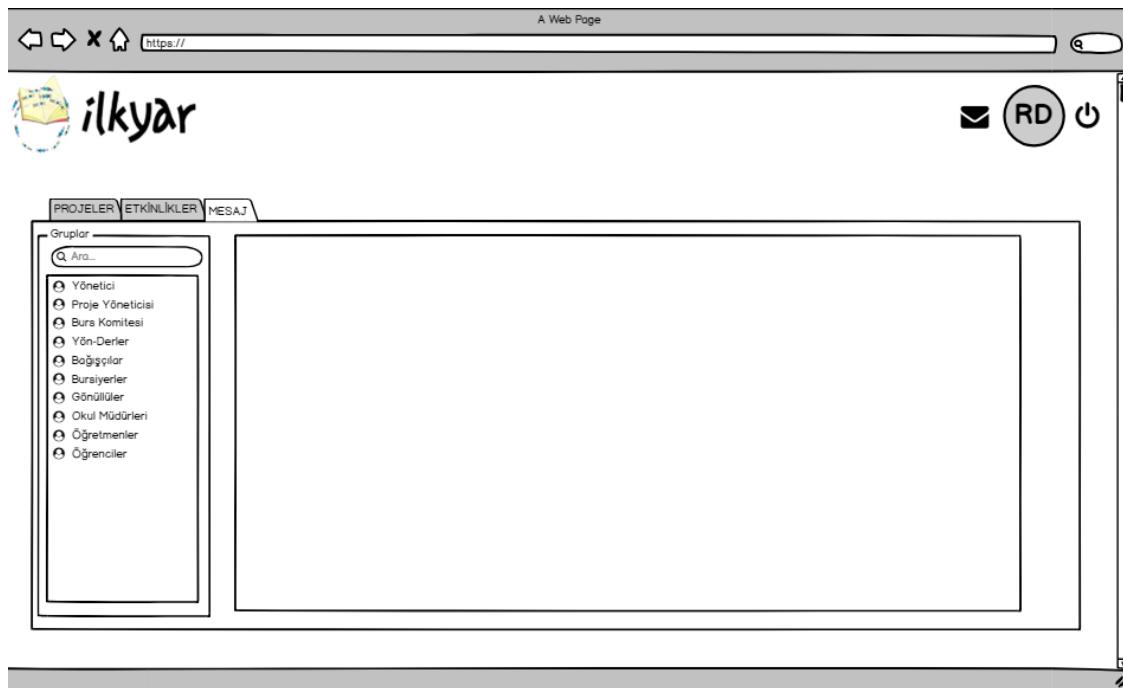


Figure 40 Message operations on Web platform

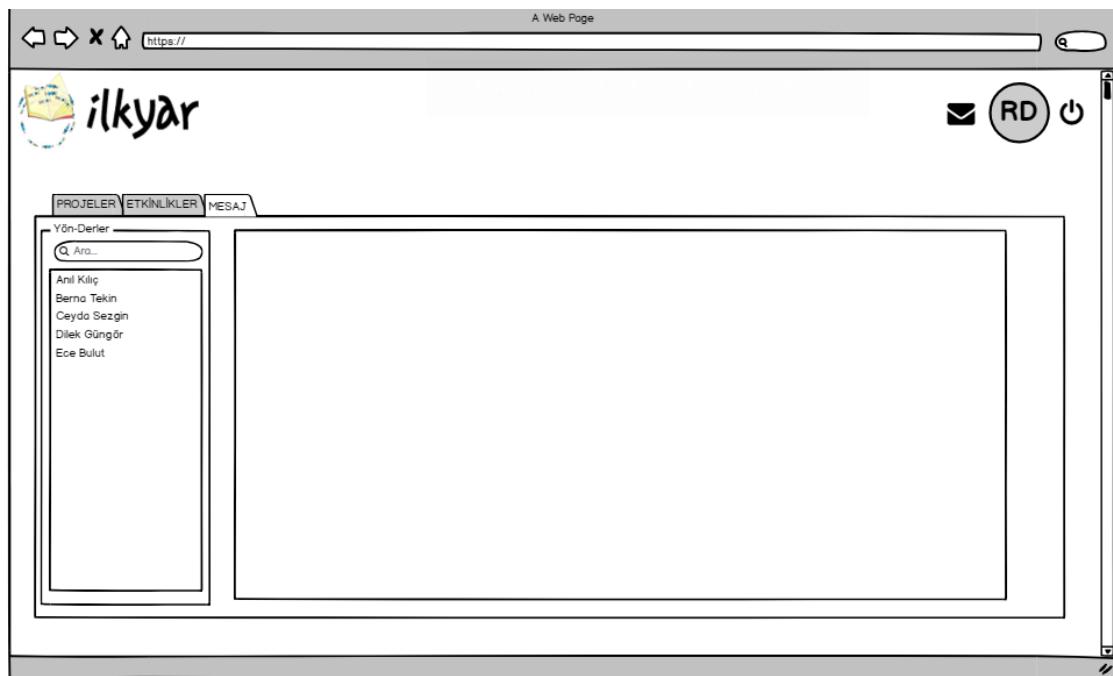


Figure 41 Message operations on Web platform (cont'd)

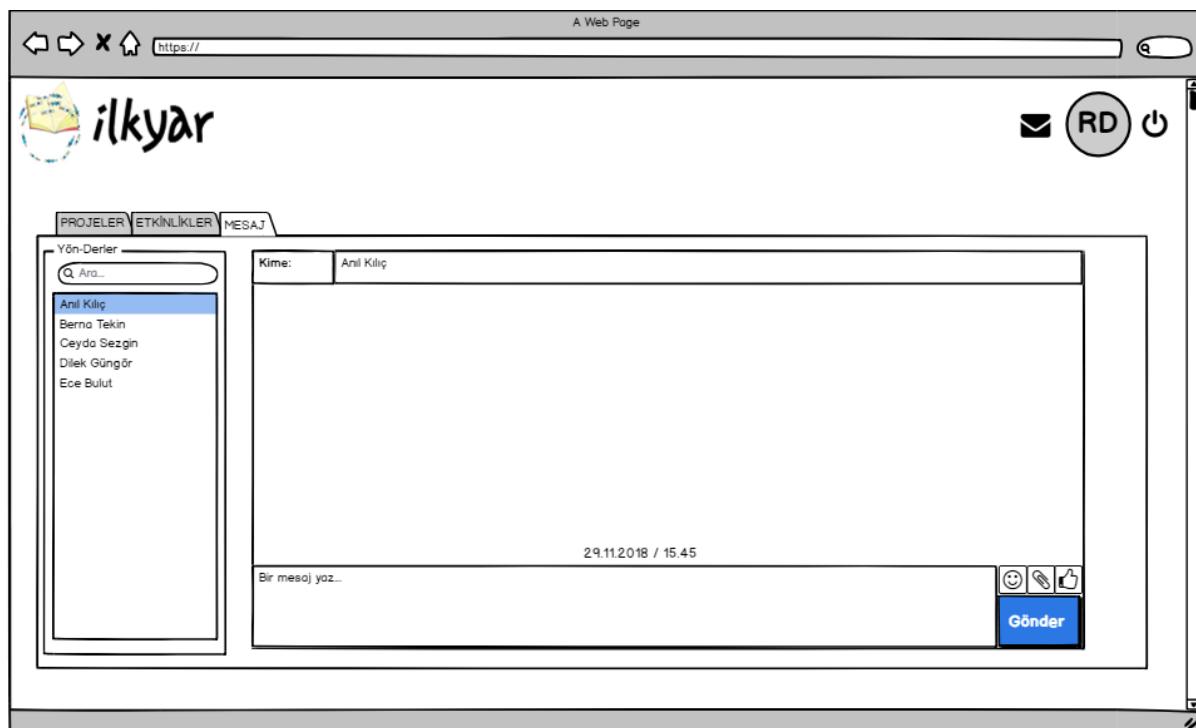


Figure 42 Message operations on Web platform (cont'd)

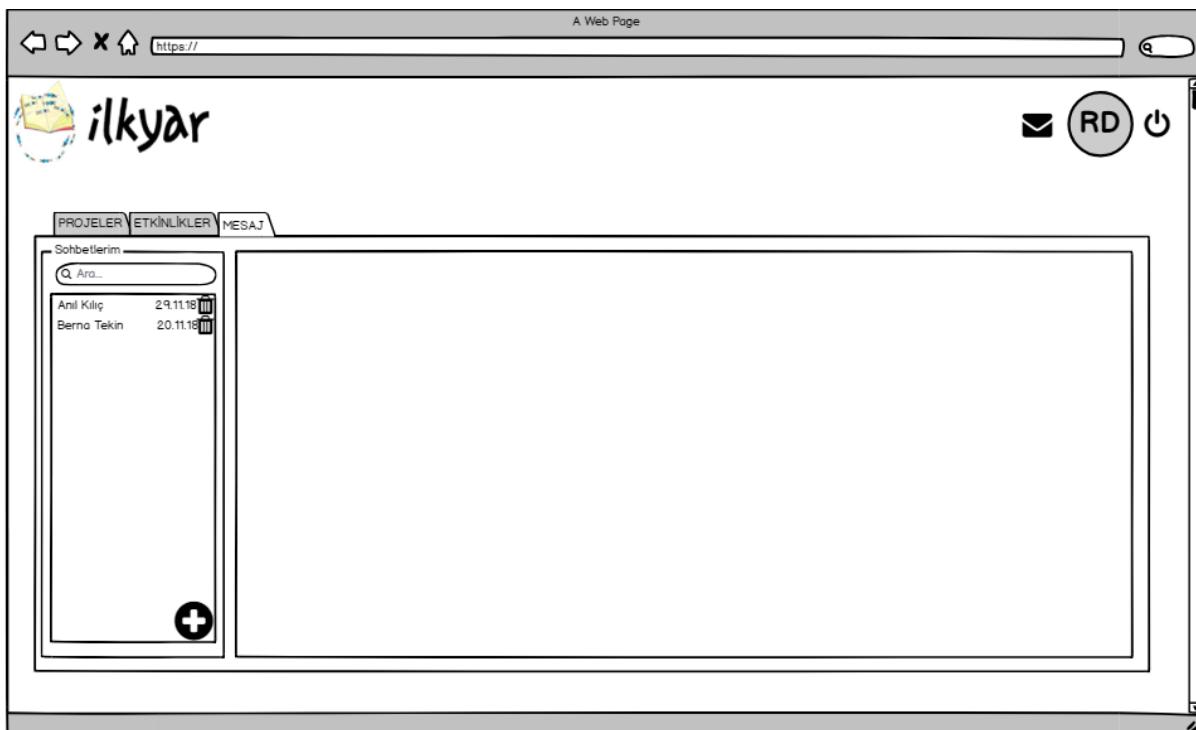


Figure 43 Message operations on Web platform (cont'd)

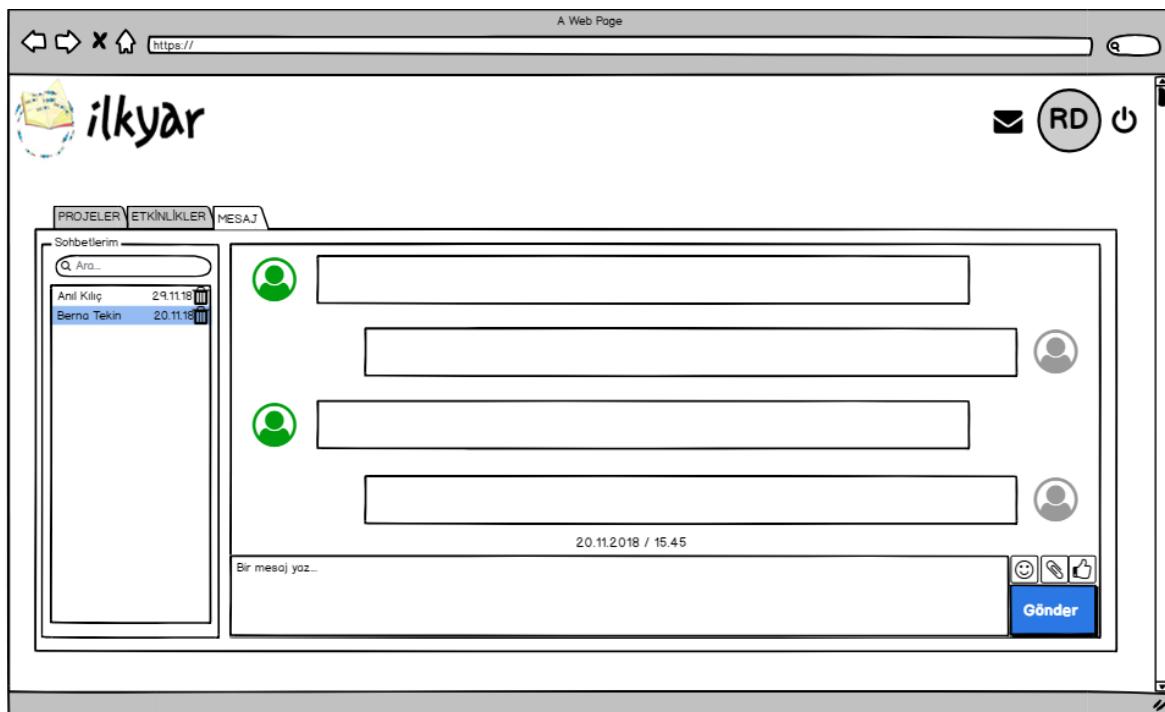


Figure 44 Message operations on Web platform (cont'd)



Figure 45 Message operations on Android and iOS platforms



Figure 46 Message operations on Android and iOS platforms (cont'd)



Figure 47 Message operations on Android and iOS platforms (cont'd)



Figure 48 Message operations on Android and iOS platforms (cont'd)



Figure 49 Message operations on Android and iOS platforms (cont'd)



Figure 50 Message operations on Android and iOS platforms (cont'd)



Figure 51 Message operations on Android and iOS platforms (cont'd)



Figure 52 Message operations on Android and iOS platforms (cont'd)

4.2.2.3.2. Communication via E-Mail

Summary: User can receive and send messages via E-Mail tab inside the application.

Actor: All users.

Precondition: The user must login to the system and click on “E-MAIL” tab. If s/he would like to write new mail, s/he must fill the form on the page. Then, the person whom the message is sent must be selected to write the message. After the writing the message, it is sent by clicking on “Gönder” button. If the user wants to see the received, sent and deleted mails s/he can click the buttons seperately.

Basic Sequence:

- 1) The user must login to the system with related e-mail and password information.
- 2) The user must click on the “E-MAIL” tab.
- 3) If the user wants to send new mail, s/he must fill the form on the page.
- 4) After typing the mail, s/he must send the message by clicking the “Gönder” button as it is shown in Figure 58.
- 5) If the user wants to see the mails in Inbox, s/he should click on “Gelen E-Postalar” button as it is shown in Figure 53-54-57.

- 6) If the user wants to see the sent mails, s/he should click on “Gönderilen E-Postalar” button as it is shown in Figure 55.
- 7) If the user wants to see the deleted mails, s/he should click on “Çöp Kutusu” button as it is shown in Figure 56.

Exception: None

Post Conditions: After each operation, mail boxes should be re-organized.

Priority: High

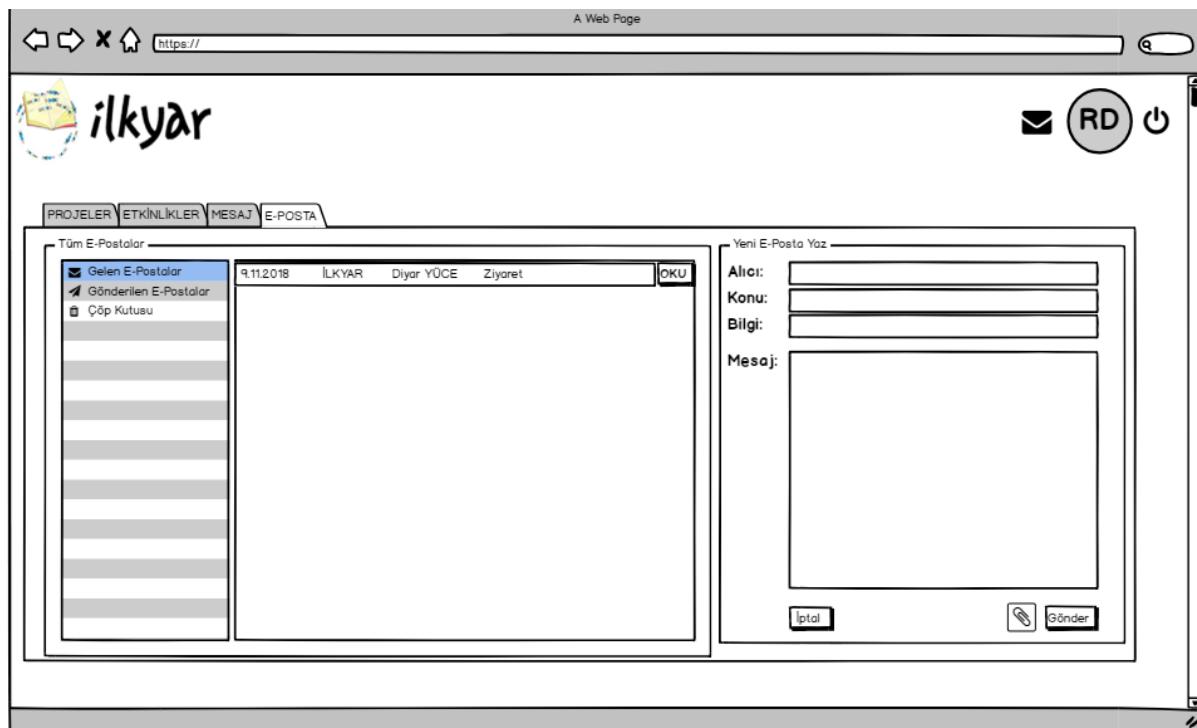


Figure 53 E-Mail Operations on Web platform

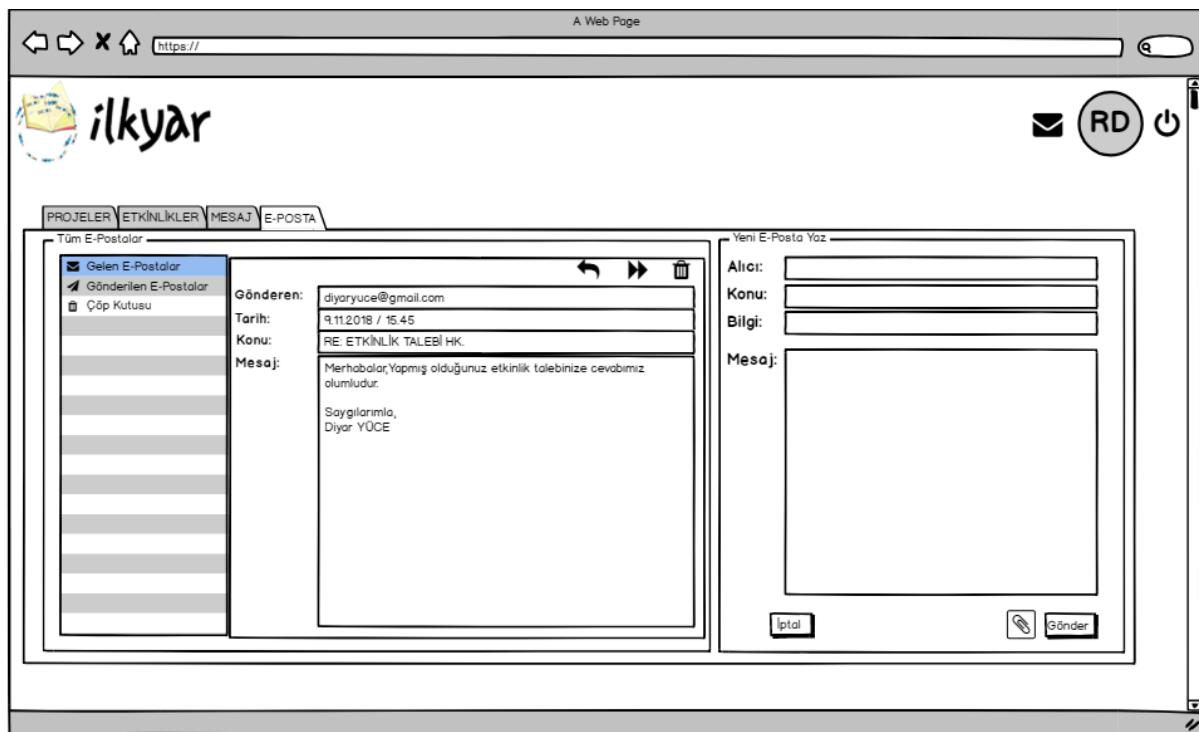


Figure 54 E-Mail Operations on Web platform (cont'd)

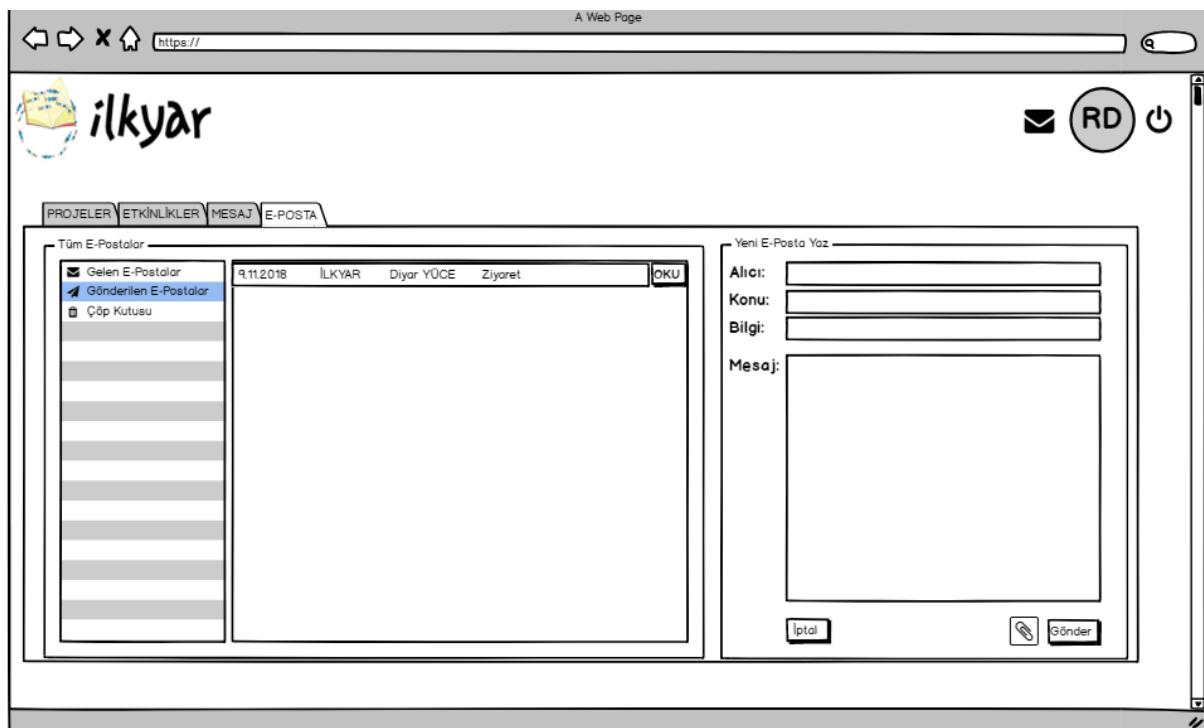


Figure 55 E-Mail Operations on Web platform (cont'd)

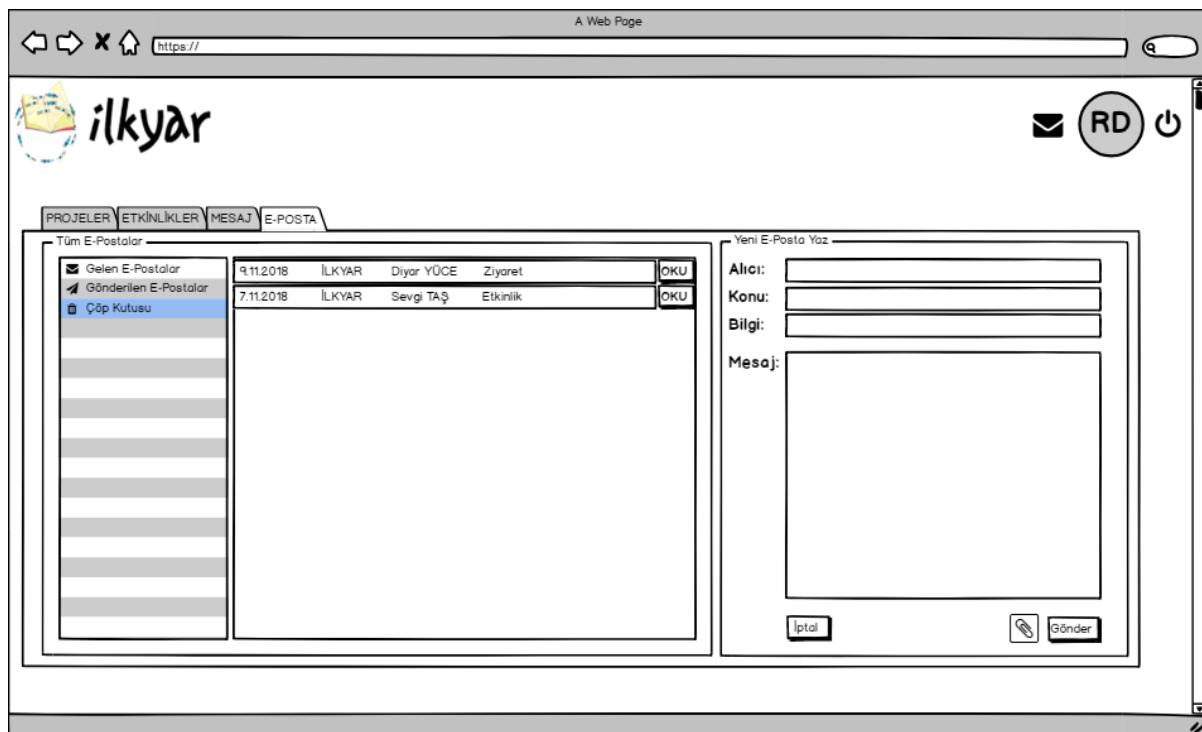


Figure 56 E-Mail Operations on Web platform (cont'd)



Figure 57 E-Mail Operations on Android and iOS platforms



Figure 58 E-Mail Operations on Android and iOS platforms (cont'd)

4.2.2.4. User Detail Management

4.2.2.4.1. User Listing & User Detail Accessing

Summary: User can list the other users that s/he would like to see details of if the user is allowed by the system.

Actor: All users.

Precondition: The user must login to the system and click on related tab.

Basic Sequence:

- 1) The user must login to the system with related e-mail and password information.
- 2) The user must click on the “KULLANICILAR” button if s/he would like to see the list of his/her connections as it is shown in Figures 59-63.
- 3) The user must select the related group, which s/he wants to list from the combo box which is illustrated in Figures 60-64.
- 4) Then, the user should click on “Listele” button to see the list as it is shown in Figure 61.

- 5) If the user wants to examine the details of a selected user, s/he can move on to the profile information by clicking on the user name on the list in Figures 62-65.

Exception: None

Post Conditions: None

Priority: Low

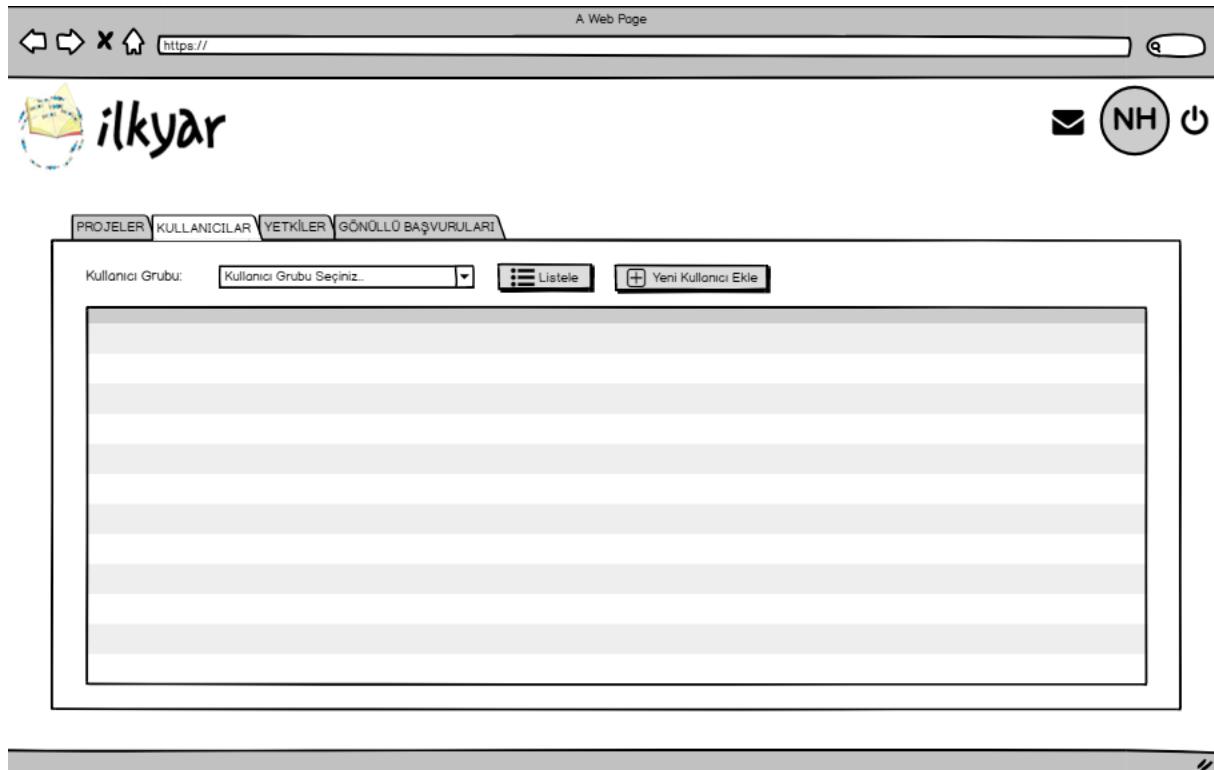


Figure 59 User listing and user detail accessing on Web platform

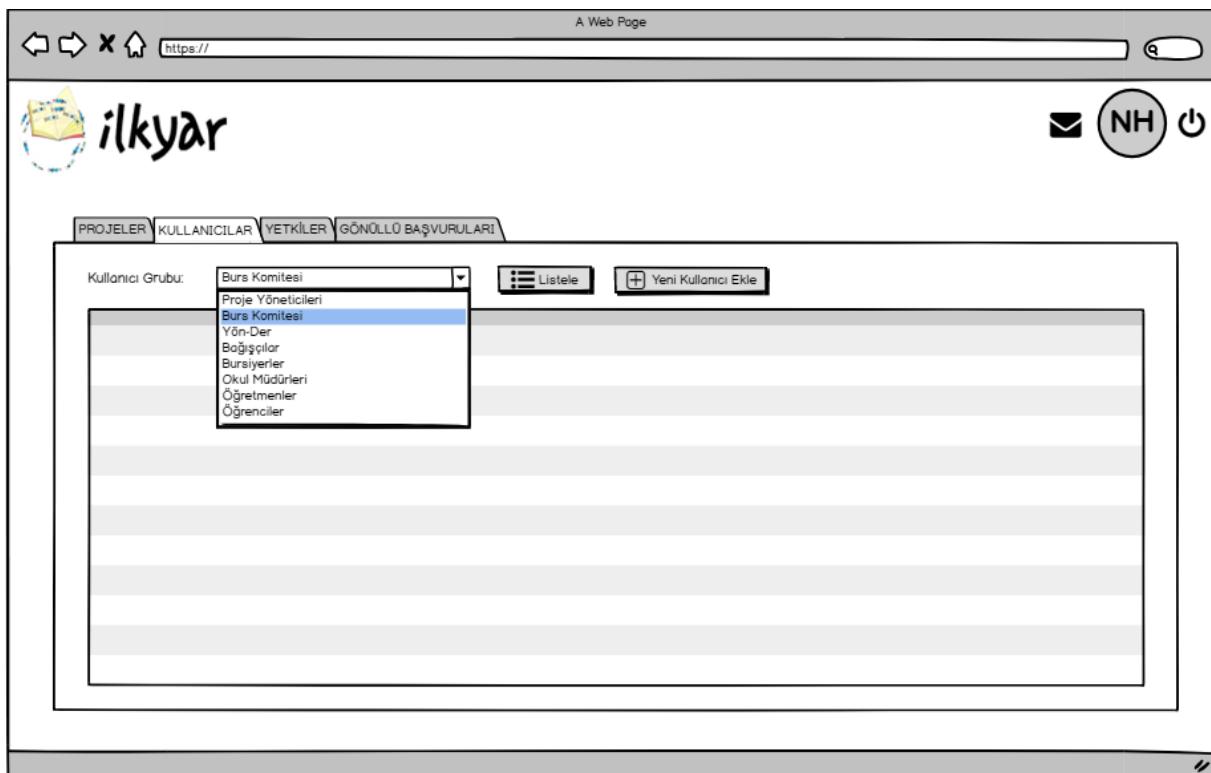


Figure 60 User listing and user detail accessing on Web platform (cont'd)

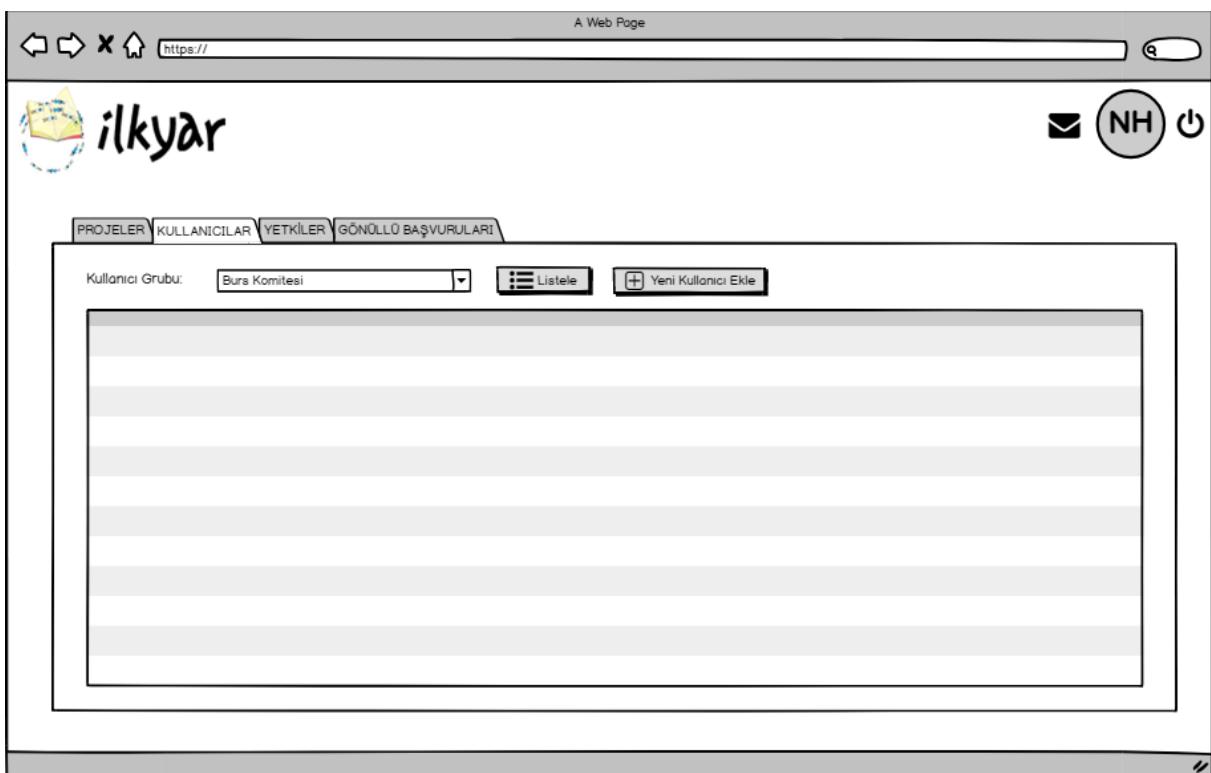


Figure 61 User listing and user detail accessing on Web platform (cont'd)

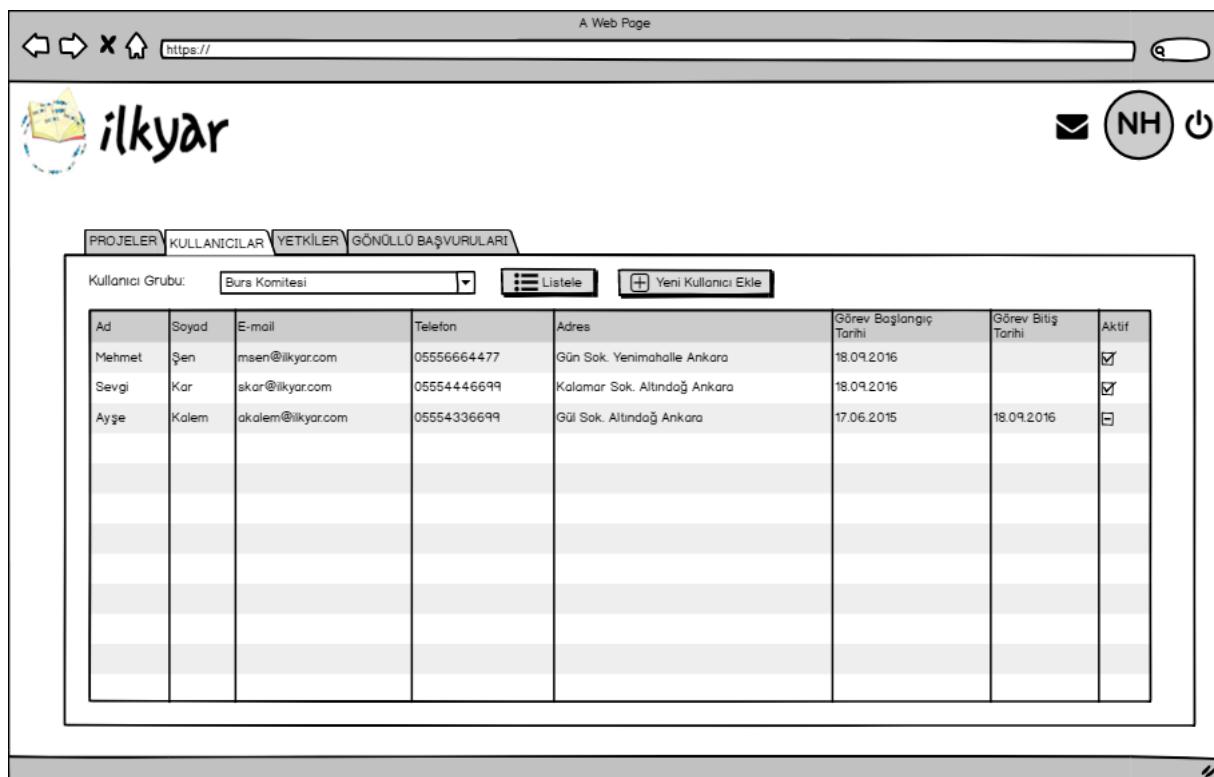


Figure 62 User listing and user detail accessing on Web platform (cont'd)

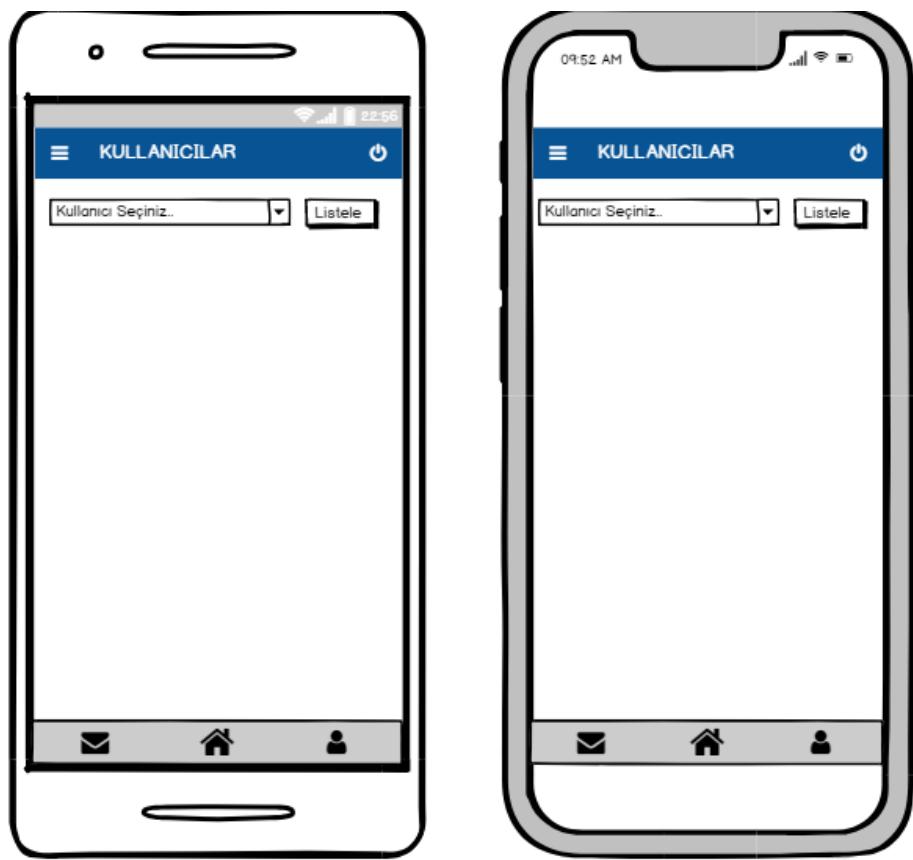


Figure 63 User listing and user detail accessing on Android and iOS platforms



Figure 64 User listing and user detail accessing on Android and iOS platforms (cont'd)



Figure 65 User listing and user detail accessing on Android and iOS platforms (cont'd)

4.2.2.4.2. New User Adding

Summary: User can add new user for the selected type of user group.

Actor: NGO Head, Project Manager, and Scholarship Committee.

Precondition: The user must login to the system and click on related tab. Then the user must click on “Yeni Kullanıcı Ekle” button.

Basic Sequence:

- 1) The user must login to the system with related e-mail and password information.
- 2) The user must click on the “KULLANICILAR” button if s/he would like to see the list of his/her connections.
- 3) The user must select the related group which s/he wants to add to from the combobox.
- 4) Then, the user must click on the “Yeni Kullanıcı Ekle” button.
- 5) The user must enter the related information about the new user as it is shown in Figures 66 and 67.
- 6) After entering all information, the user must click on “Kaydet” button.

Exception: None

Post Conditions: The user list should be re-organized.

Priority: Medium

The screenshot shows a web browser window titled "A Web Page" with the URL <https://>. The page is for "ilkyar". The main navigation menu includes "PROJELER", "KULLANICILAR", "YETKİLER", and "GÖN". A sub-menu under "KULLANICILAR" shows the group "Burs Komitesi" selected. On the left, there is a table listing users: Mehmet (mser@ilkyar.com), Sevgi (skar@ilkyar.com), and Ayşe (akalem@ilkyar.com). In the center, a modal dialog box titled "Yeni Kullanıcı Ekle" (Add New User) is open. It contains fields for "Kullanıcı Grubu" (User Group), "Ad" (Name), "Soyad" (Last Name), "İl" (City), "İlçe" (District), "Görev Başlangıç" (Start Date), "Görev Bitiş" (End Date), "E-mail", "Telefon", and "Adres" (Address). There are also "İptal" (Cancel) and "Kaydet" (Save) buttons. To the right of the modal, a table lists tasks with columns "Görev Başlangıç Tarihi", "Görev Bitiş Tarihi", and "Aktif" (Active). The tasks listed are: 18.09.2016, 18.09.2016, checked; 18.09.2016, 18.09.2016, checked; 17.06.2015, 18.09.2016, unchecked.

Figure 66 New user adding on Web platform

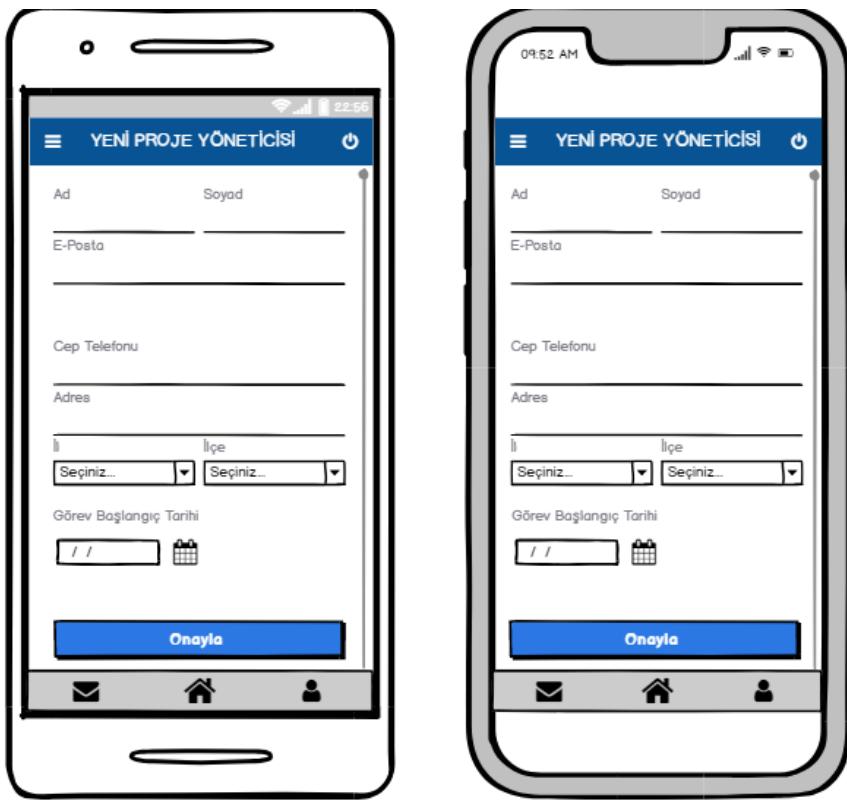


Figure 67 New user adding on Android and iOS platforms

4.2.2.4.3. Listing and Viewing Reports

Summary: User can list the reports about scholarship holders' academic standings.

Actor: Scholarship Committee, Yön-Der, and Scholarship Holder.

Precondition: The user must login to the system and click on related tab. Then the user must click on “Raporları Listele” button as it is shown in Figures 68-71. Then, s/he should click on the report name that s/he would like to view as it is illustrated in Figures 69-62. Hence s/he can examine the reports as it is shown in Figures 70-73.

Basic Sequence:

- 1) The user must login to the system with related e-mail and password information.
- 2) The user must click on the “Raporları Listele” button on detail page to list the reports.
- 3) Then, the user must click on the report name that s/he would like to view.

Exception: None

Post Conditions: None

Priority: Low

A Web Page

The screenshot shows a web browser window with the URL <https://>. The page title is "A Web Page". The header includes the ilkyar logo and navigation links: BURSİYERLER, YÖN-DERLER, MESAJ. Below this is a sub-navigation bar: BURSİYER LİSTESİ, BURSİYER ADAYLARI. The main content area is titled "Bursiyer Detayları" and displays the following information for student Deniz Kaya:

Deniz Kaya	Ad	Deniz
denizkaya@hotmail.com	Soyad	Kaya
	Doğum Tarihi	23.01.2001
	Cep Telefonu	0532 147 25 36
	Hesap No	TR00000000000000
	Yön-Der	Anıl Kılıç
	E-Posta	denizkaya@hotmail.com
	Adres	Mustafa Kemal Mahallesi.....
	İl	Ankara
	İlçe	Çankaya
	Eğitim Seviyesi	Lise
	Sınıf	3
	Okul Adı	Atatürk Lisesi

On the right side, there is a table of family information:

Not Ortalaması	87,5
Anne Adı	Meltem
Annesinin Mesleği	Ev Hanımı
Baba Adı	Kemal
Babasının Mesleği	Serbest Meslek
Kardeş Sayısı	2
Sağlık Durumu	Engelli Yok
Aile Aylık Geliri(TL)	2200
Burs Miktarı(TL)	300
Burs Baş.Tarihi	23.01.2015
Burs Bit. Tarihi	23.01.2019

Figure 68 Listing and viewing reports on Web platform

A Web Page

The screenshot shows a web browser window with the URL <https://>. The page title is "A Web Page". The header includes the ilkyar logo and navigation links: BURSİYERLER, YÖN-DERLER, MESAJ. Below this is a sub-navigation bar: BURSİYER LİSTESİ, BURSİYER ADAYLARI. The main content area is titled "Bursiyer Detayları" and displays the same information for student Deniz Kaya as in Figure 68.

To the right, there is a section titled "Raporları Listele" (List Reports) showing a table of reports:

Yön-Der	Tarih	Görüntüle
Anıl Kılıç	18.11.2018	...

Figure 69 Listing and viewing reports on Web platform (cont'd)

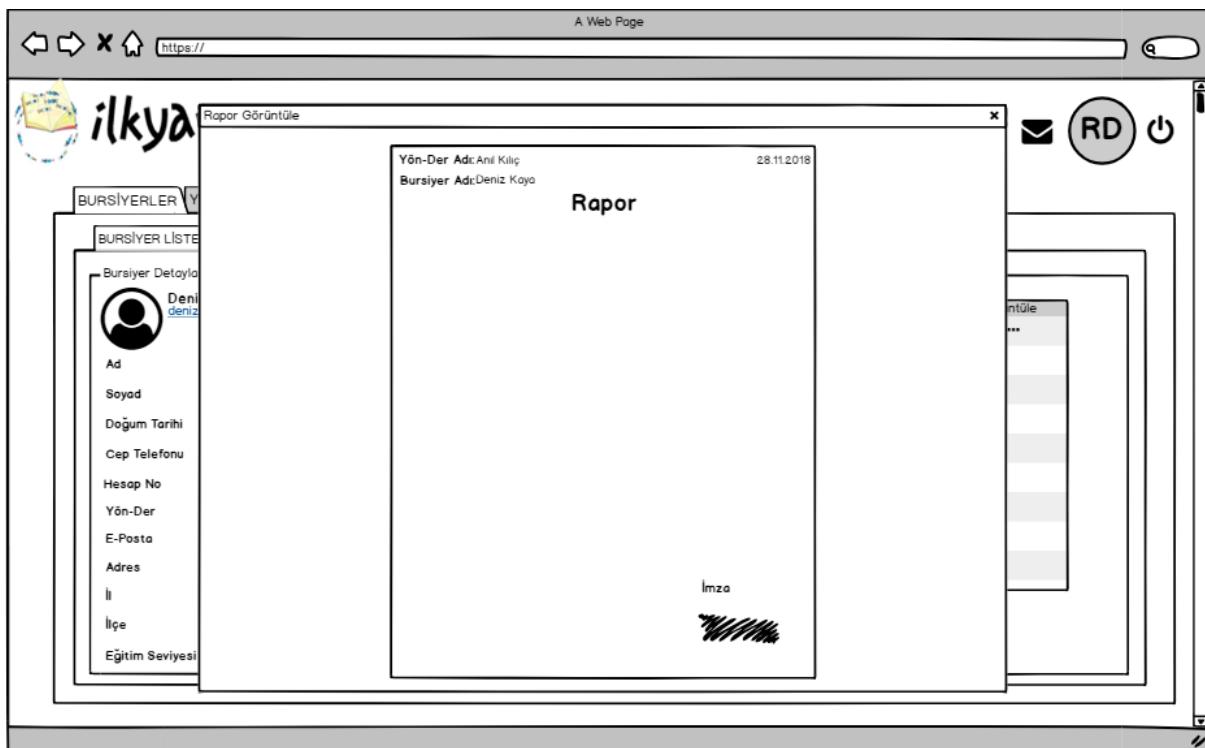


Figure 70 Listing and viewing reports on Web platform (cont'd)



Figure 71 Listing and viewing reports on Android and iOS platforms

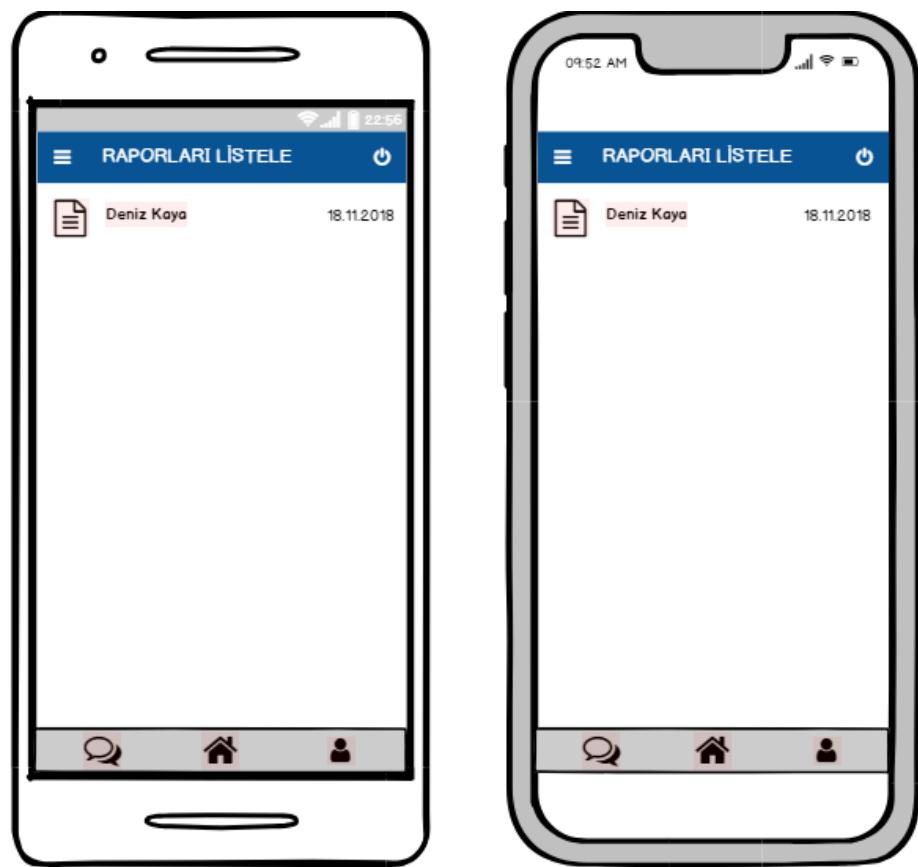


Figure 72 Listing and viewing reports on Android and iOS platforms (cont'd)



Figure 73 Listing and viewing reports on Android and iOS platforms (cont'd)

4.2.2.4.4. Writing New Report

Summary: User can write new report about scholarship holders' academic standings.

Actor: Yön-Der

Precondition: The user must login to the system and click on related tab. Then the user must click on “BURSİYERLERİM” tab. Then, s/he can write a new report about the related Scholarship Holder on detail page.

Basic Sequence:

- 1) The user must login to the system with related e-mail and password information.
- 2) The user must click on the “BURSİYERLERİM” tab.
- 3) Then, the user must click on the detail of related Scholarship Holder.
- 4) The user can write new report about the Scholarship Holder by using the form as it is shown in Figures 74-76.
- 5) After writing the report, the user must save the record by clicking on “Kaydet” button as it is illustrated in Figures 75-77.

Exception: None

Post Conditions: After saving the report, a validation message should be seen on the screen.

Priority: Medium

A Web Page

https://

ilkyar

BURSİYERLERİM MESAJ

BURSİYER İŞLEMLERİ

Bursiyer Detayları

Deniz Kaya	denizkaya@hotmail.com
Ad	Deniz
Soyad	Kaya
Doğum Tarihi	23.01.2001
Cep Telefonu	0532 147 25 36
Hesap No	TR00000000000000
Yön-Der	Anıl Kılıç
E-Posta	denizkaya@hotmail.com
Adres	Mustafa Kemal Mahalles
İl	Ankara
İlçe	Çankaya
Eğitim Seviyesi	Lise

Sınıf	3
Okul Adı	Atatürk Lisesi
Not Ortalaması	87,5
Anne Adı	Meltem
Annesinin Mesleği	Ev Hanımı
Baba Adı	Kemal
Babasının Mesleği	Serbest Meslek
Kardeş Sayısı	2
Seğlik Durumu	Engelli Yok
Aile Aylık Geliri(TL)	2200
Burs Miktarı(TL)	300
Burs Baş.Tarihi	23.01.2015
Burs Bit. Tarihi	23.01.2019

Yeni Rapor

Tarih: 01.12.2018

İçeriğin:

Vazgeç Kaydet

Figure 74 Writing new report on Web platform

A Web Page

https://

ilkyar

BURSİYERLERİM MESAJ

BURSİYER İŞLEMLERİ

Bursiyer Detayları

Deniz Kaya	denizkaya@hotmail.com
Ad	Deniz
Soyad	Kaya
Doğum Tarihi	23.01.2001
Cep Telefonu	0532 147 25 36
Hesap No	TR00000000000000
Yön-Der	Anıl Kılıç
E-Posta	denizkaya@hotmail.com
Adres	Mustafa Kemal Mahalles
İl	Ankara
İlçe	Çankaya
Eğitim Seviyesi	Lise

Sınıf	3
Okul Adı	Atatürk Lisesi
Not Ortalaması	87,5
Anne Adı	Meltem
Annesinin Mesleği	Ev Hanımı
Baba Adı	Kemal
Babasının Mesleği	Serbest Meslek
Kardeş Sayısı	2
Seğlik Durumu	Engelli Yok
Aile Aylık Geliri(TL)	2200
Burs Miktarı(TL)	300
Burs Baş.Tarihi	23.01.2015
Burs Bit. Tarihi	23.01.2019

Yeni Rapor

Raporunuz Başarıyla Sisteme Kaydedilmiştir.

✓

Figure 75 Writing new report on Web platform (cont'd)

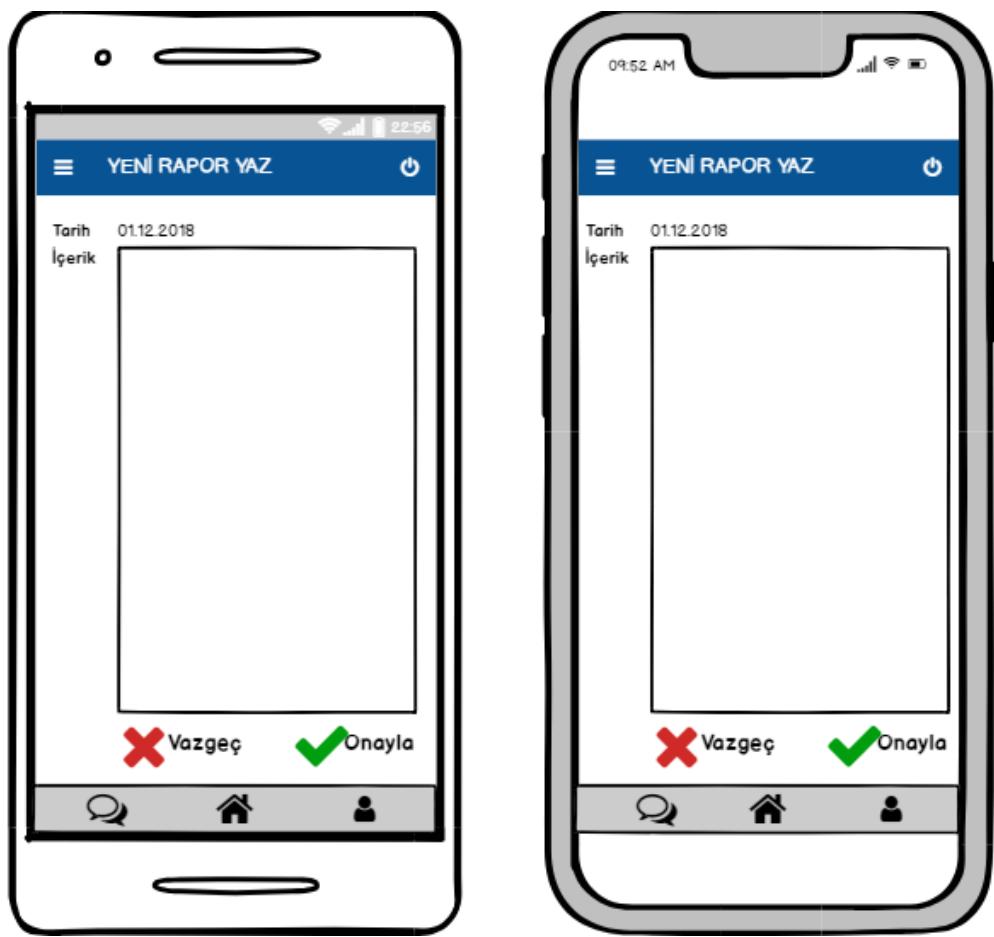


Figure 76 Writing new report on Android and iOS platforms

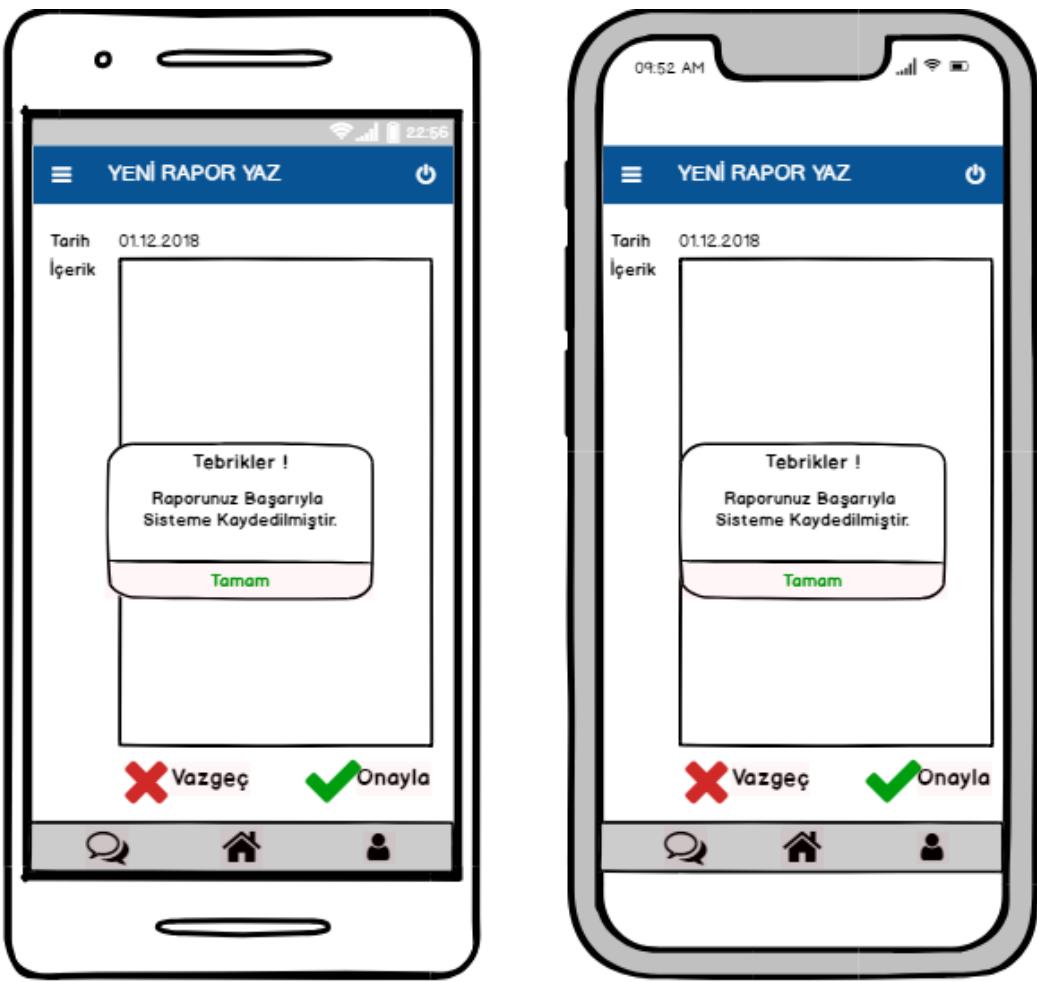


Figure 77 Writing new report on Android and iOS platforms (cont'd)

4.2.3. Entity Relationship Diagram

An entity relationship (ER) diagram illustrated in the Figure 78 indicates the relation between entities within a system. In this design, there are twenty-seven entities relating with each other. Since the figure pressed to allow seeing the whole picture, details are explained by the extended pieces of the Figure 79-83.

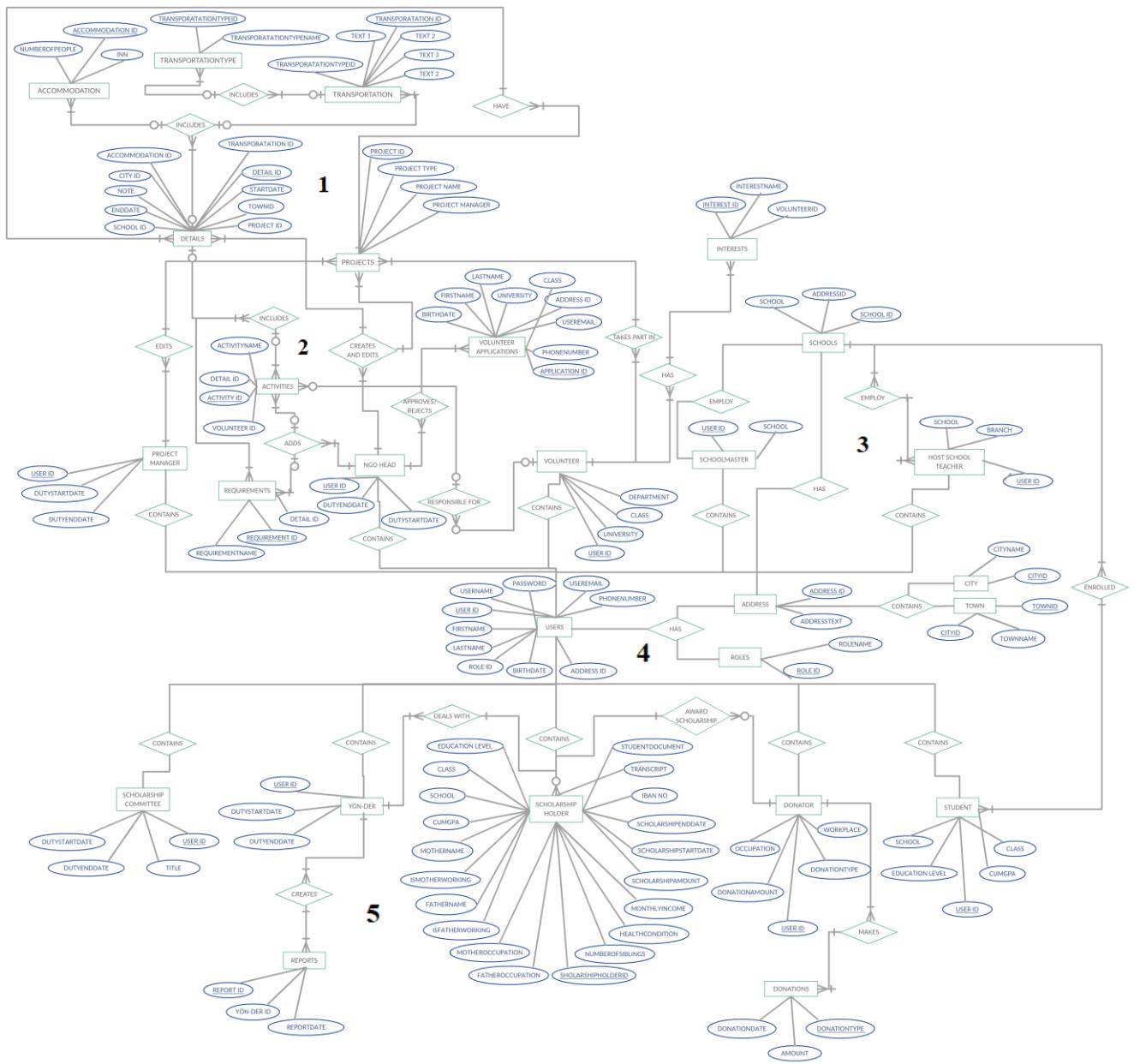


Figure 78 Entity Relationship Diagram

“PROJECTS” entity have “DETAILS” and each detail includes accommodation details, transportation details activities and requirements as shown in Figure 80-82.

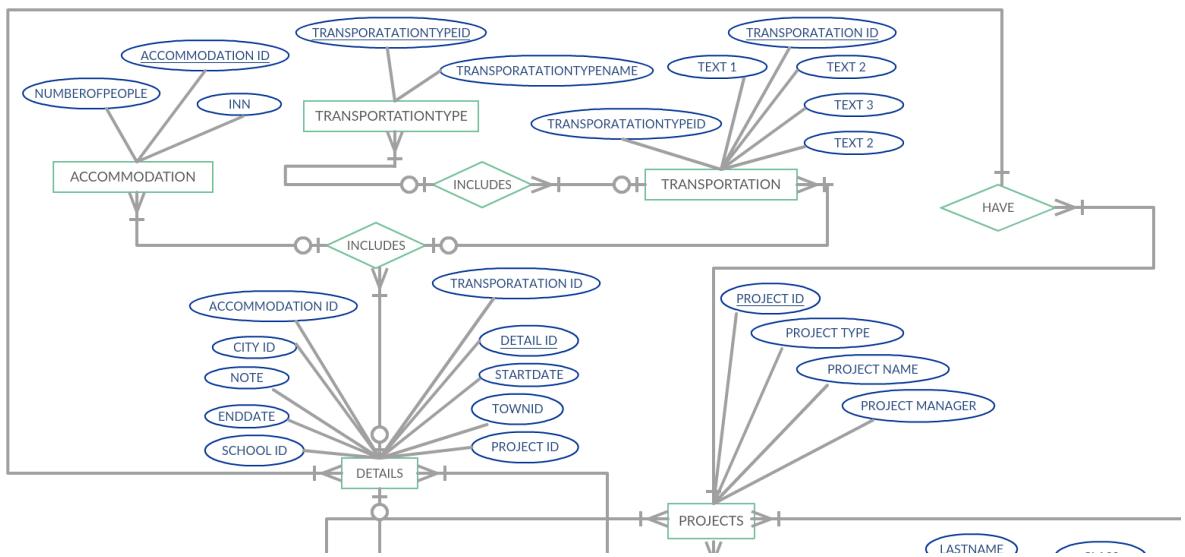


Figure 79 First piece of Figure 78

Project manager can edit projects and details. Besides, NGO Head is able to create and edit projects and details. S/he can approve or reject volunteer applications as well indicated by Figure 80.

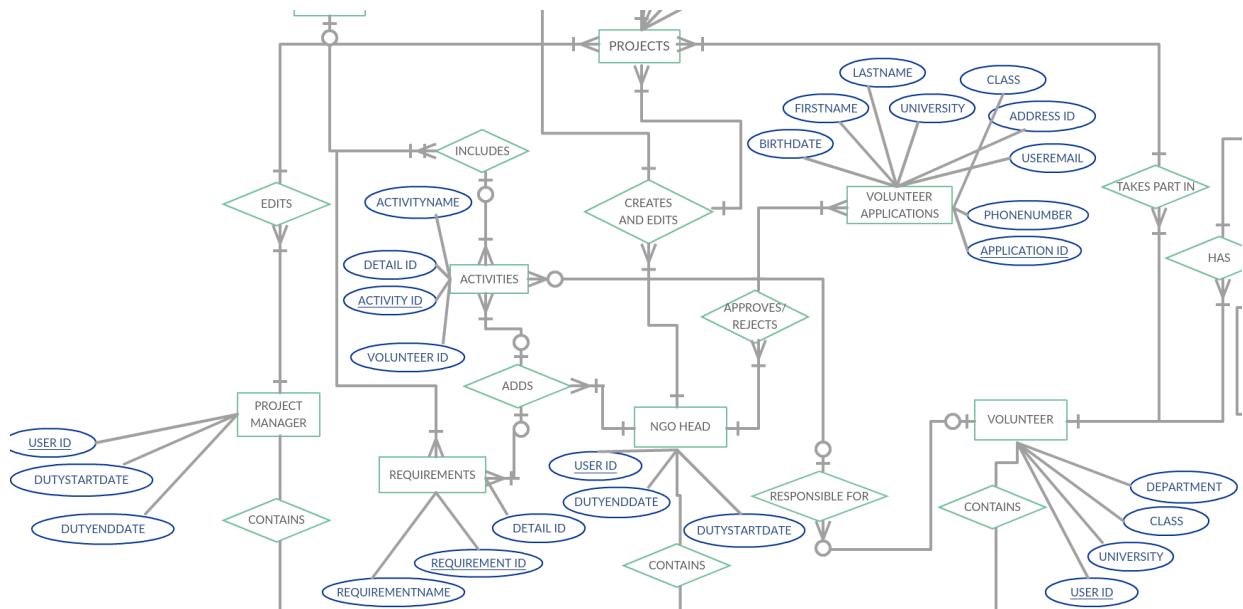


Figure 80 Second piece of Figure 78

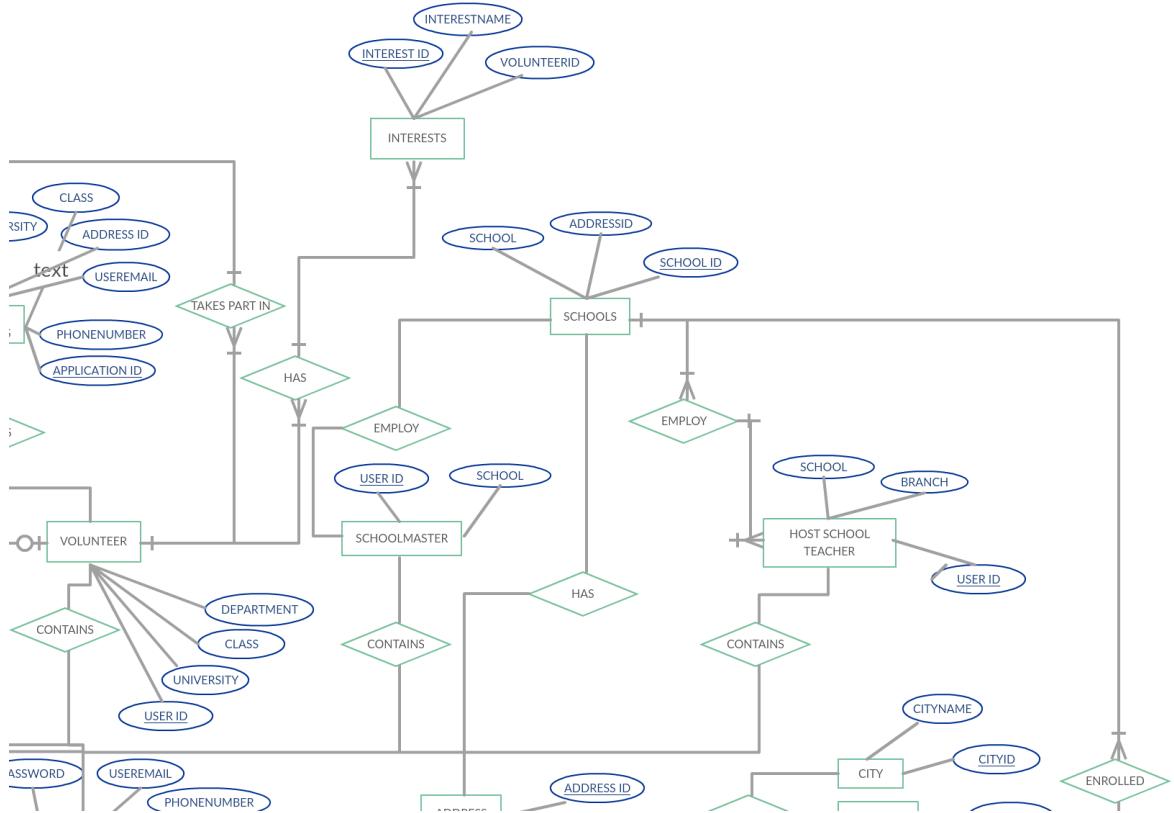


Figure 81 Third piece of Figure 78

“USERS” entity related with the “ADDRESS” and “ROLES” shown in Figure 82.

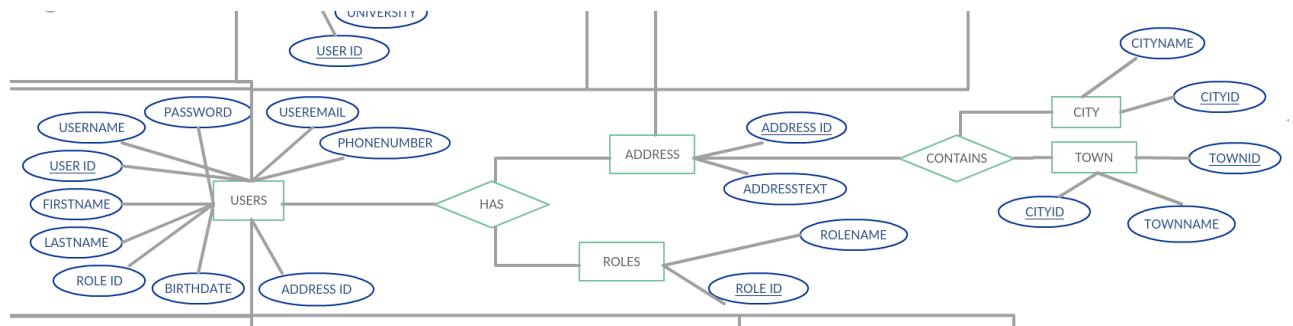


Figure 82 Fourth piece of Figure 78

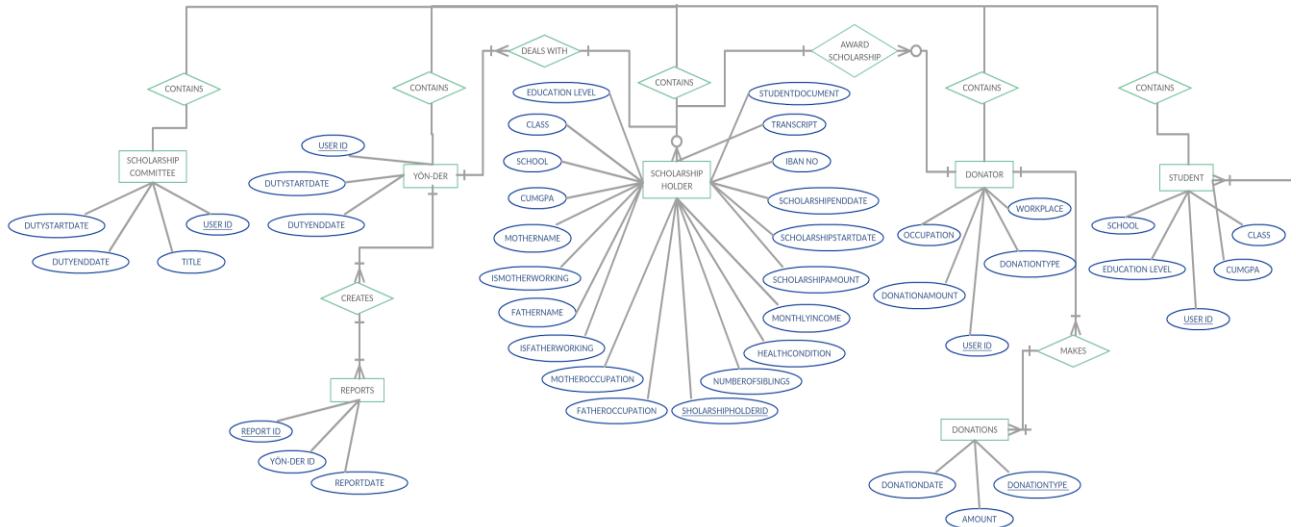


Figure 83 Fifth piece of Figure 78

4.3. ENVIRONMENT

In the project, for the software design pre-working Balsamiq Mockups is used to illustrate each platform separately and effectively. It is essential for the flow of the project to observe and examine the requirements and other issues. Also, to draw the Use Case Diagrams and Class Diagrams; Creately: Diagram Maker online drawing application is used. On the following of the project, Visual Studio ASP.NET Framework is planned to use for Web platform design and development by using C# programming language. Therefore, while developing the mobile application on Android and iOS, a Visual Studio extension Xamarin is planned to use. Owing to the fact that the project is managed by using Scrum methodology, a Microsoft Store Windows application MeisterTask is preferred to use to follow the sprints.

4.4. CONCLUSION

In this “I-NGOS Intelligent Non-Governmental Organizations Management System Project”, it is aimed to develop an application on Web, Android and iOS platforms. Since the lack of this type of program, many non-governmental organizations suffer from inefficient and unused packet programs or tools. To handle this issue, it is planned to develop I-NGOS project. At the beginning, the development methodology is defined as Scrum methodology and tasks were divided into sprints. Then, the requirements were considered. Furthermore, the work and time plan was created. Besides, the design of the application and user interfaces were dedicated. Within the concepts of CENG 407 course, all the steps are completed successfully and CENG 408’s tasks are examined separately.

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