ÇANKAYA UNIVERSITY
FACULTY OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

Project Report

Version 1

CENG 407

Innovative System Design and Development I

202316 BINEL

Fatih ÖNER
201811047
Emirhan KARAKAYA
202011210
Duygu DORAN
202011024
Serkan ŞAHİNOĞLU
201911059

Advisor: *Dr.Murat SARAN*

Table of Contents

Abstract

Binel is a web application project that aims to develop social cooperation and donation culture. This standard platform brings together companies and organizations and offers donations and cooperation in a reliable and transparent environment. In the project, users are identified with colored groups and signs specific to their preferred accounts, programs and categories, enabling them to access different dimensions of social cooperation. In this way, a unique structure is created to increase security and empowerment, which is the main purpose of growth.

Binel's web application offers a user-friendly program for users to manage their personal profiles, create and track donation campaigns, and make customizations by categories. The platform is designed to protect the user with secure payment transactions and data protection measures, while also enriching the user experience and supporting a culture of social cooperation. Binel is a web application project that strengthens the understanding of social responsibility and brings together those who need help and those who want to help.

Özet

Binel, toplumsal işbirliği ve bağış kültürünü geliştirmeyi amaçlayan bir web uygulama projesidir. Bu standart platform, şirket ve kuruluşları bir araya getirerek güvenilir ve şeffaf bir ortamda bağış ve işbirliği sunmaktadır. Projede kullanıcılar tercih ettikleri hesap, program ve kategorilere özel renkli grup ve işaretlerle tanımlanarak sosyal işbirliğinin farklı boyutlarına erişim sağlanıyor. Bu sayede büyümenin temel amacı olan güvenliği ve yetkilendirmeyi artıracak özgün bir yapı yaratılmaktadır.

Binel'in web uygulaması, kullanıcıların kişisel profillerini yönetebilmeleri, bağış kampanyaları oluşturup takip edebilmeleri, kategorilere göre özelleştirmeler yapabilmeleri için kullanıcı dostu bir program sunuyor. Platform, güvenli ödeme işlemleri ve veri koruma önlemleriyle kullanıcıyı korumak, aynı zamanda kullanıcı deneyimini zenginleştirmek ve sosyal işbirliği kültürünü desteklemek üzere tasarlandı. Binel, sosyal sorumluluk anlayışını güçlendiren, yardıma ihtiyacı olanlarla yardım etmek isteyenleri bir araya getiren bir web uygulama projesidir.

1 Introduction

The Binel project represents a comprehensive web platform that aims to develop social cooperation and donation culture. The basis of this project was inspired by the success of leading social welfare organizations such asthe Ahbap Association, while identifying shortcomings and areas for improvement compared to existing work. In this context, the Literature Review section highlights Binel's innovations by analyzing the structural and functional features of similar projects. Binel's prominent features aim to increase user experience and strengthen the culture of social assistance by providing solutions to the difficulties frequently encountered in social assistance applications in the existing literature. Then, the Software Requirements Specification section concretizes the project objectives by detailing Binel's functional and technical requirements. This stage reveals the criteria determined for the successful implementation of the project and forms the cornerstones of the development process. Finally, the Software Design Description section provides a basis for the project by covering Binel's architectural structure, database design and user interface features. This chapter details Binel's complexity and unique design elements, providing a guide to the successful implementation of the project.

2 Literature Review

2.1Introduction

This literature review report aims to provide the essential information and context required for developing the Binel Project. The Binel Project aims to create a platform facilitating community contributions and aid. Its primary objective is to promote solidarity among people and integrate this solidarity with social media to reach a broader audience.

While addressing several critical aspects, the report intends to lay the foundation for understanding the project's key components and challenges. These areas encompass essential knowledge fields such as security, database management, user interface design, payment transactions, and personal data protection laws.

This introductory section serves as a summary of the fundamental purpose and scope of the Binel Project. It previews the topics explored throughout the rest of the report. In the subsequent sections, we will detail each project component, discuss how these components can effectively implement challenges overcome, and introduce Related Technologies and similar projects that can be used in the project.

2.2 Related Technologies

2.2.1 Web Technologies

In today's world, web applications hold significant importance in terms of accessibility and popularity. Having a web application for the BİNEL project is crucial to reaching more people and impacting their lives.

2.2.1.1Front-end technologies

Web application designs affect factors such as memorability, ease of use, and usage duration. Therefore, it is important for the web application developed for the BİNEL project to have a well-crafted design.

During the creation of designs for web applications, the utilized technologies and their respective areas of use are as follows:

- HTML (Hypertext Markup Language): It is a markup language that allows the creation of the structure of a website with its elements. It also facilitates the grouping of related elements within this structure, allowing other design technologies (CSS, JavaScript) to make changes and modifications [1][2].

- CSS (Cascading Style Sheets): This language is used for coloring and sizing designs. It involves adjusting HTML elements with specific definitions enhancing their visual appeal [3][4][5].

- JavaScript: This programming language is employed to achieve a more dynamic appearance of web pages. It transmits input from forms and similar fields to the application's backend. Before transmission, necessary adjustments are made to ensure proper functionality [6].

- Bootstrap is a framework and a library designed to develop web applications using HTML, CSS, and JavaScript. It includes components and style templates crafted with these technologies. It is highly useful for creating responsive designs in web applications [7][8].

2.2.1.2 Backend-end technologies

A web application's unseen part, known as the backend, is fundamentally where processes such as data processing, management, and storage take place in the backend of the application. The web application planned to be created for the BİNEL project requires a backend structure to execute the defined functions.

When developing web applications, utilizing frameworks supported by the programming languages helps contribute to the creation of a secure, fast, and efficient application with established rules and pre-built foundational tools.

Examples of programming languages commonly used for backend development include PHP, JavaScript, Python, Java, and .NET (C#) [9].

Here are some examples of backend frameworks:

- Django: An open-source framework developed for the Python programming language, Django provides ease for developers in terms of scalability and customization. Besides popular Python features, it provides an admin interface for developers and administrators [10].

- Laravel: Laravel is an open-source PHP framework. It provides developers with advanced library and API support and is often preferred for blog, e-commerce, and news websites. It has a structure compatible with relational databases [11].

- ASP.NET: ASP.NET is a free, open-source framework. Preferred for real-time web applications, ASP.NET offers developers rich API services and microservices [12].

2.2.2 Mobile Technologies

Mobile technologies are one of the fundamental elements of the completion of the BİNEL project. The project is based on modern and powerful mobile technologies for applications for Android and iOS platforms.

2.2.2.1 Android

The Android [13] application development process of the BİNEL project focuses on Android Studio [14], a powerful integrated development environment. This official IDE is designed to enable the effective development of Android applications. The strong emulator support and extensive plugin ecosystem of Android Studio offer developers a fast and efficient working environment. Kotlin programming language has been established as the preferred language for the modern and effective development of Android applications [15]. Kotlin's expressive and secure nature gives developers a more effective coding experience. One of the core technologies used on the Android side of the project is Android Jetpack [16]. This collection of libraries and tools simplifies the development process by including core components such as database management, user interface design, and more.

2.2.2.2 iOS

For iOS [17] application development, Xcode [18] is used as an official IDE [19]. This platform offers developers a comprehensive set of tools to manage debugging, interface design, and app deployment of iOS apps.

Swift [20] programming language stands out as a modern, safe, and fast language used in developing iOS applications. This language, developed by Apple, encourages effective code writing on the iOS side of the project. Cocoa Touch is one of the core technologies used for iOS [21]. This specially designed library includes core components such as UIKit (user interface) and Core Data (database management). In this way, a comprehensive mobile application experience is provided by using the basic building blocks required to develop iOS applications in the project.

2.2.3 Multiplatform Technologies

In the realm of software development, multiplatform technologies play a crucial role in enabling developers to build applications that can run on various operating systems or platforms. This approach is beneficial for reaching a wider audience, reducing development time, and maintaining a single codebase for different platforms. After establishing the significance of employing multiplatform technologies for reaching a broader audience, optimizing development time, and maintaining a unified codebase, we will now delve into the details of three prominent frameworks: React, Flutter, and .NET Multi-platform App UI (MAUI).

2.2.3.1 React

React is a JavaScript library for building user interfaces. Developed and maintained by Facebook, React allows developers to create reusable UI components. One of its key features is the ability to efficiently update and render components based on changes in application state. React follows a declarative approach, making it easier to understand and debug code.

React can be used for building web applications, and it has been widely adopted for its simplicity and flexibility. Additionally, React Native, a framework built on top of React, extends its capabilities to mobile app development, allowing developers to write mobile applications using React and JavaScript.

React incorporates key features that contribute to its effectiveness in building user interfaces. One notable feature is the Virtual DOM, which enhances rendering efficiency by utilizing a virtual representation of the DOM. The framework also promotes a Component-Based Architecture, fostering the creation of modular and reusable components for streamlined UI management. Additionally, React adopts a Unidirectional Data Flow approach, ensuring that data within the application moves in a single direction, simplifying the handling of the application state [22][23][24][25].

2.2.3.2 Flutter

Flutter, an open-source UI software development toolkit created by Google, is designed for building natively compiled applications across mobile, web, and desktop platforms from a unified codebase. The framework utilizes the Dart programming language and employs a reactive programming style.

One of Flutter's standout features is its Widget-Based Framework, which treats every element as a widget. This approach facilitates the creation of structural elements, styling, and layouts. Notably, Flutter supports a Hot Reload feature, allowing developers to witness real-time changes in the app during development, thereby expediting the coding process.

Its ability to enable Cross-Platform Development sets Flutter apart, allowing developers to write code once and deploy it on various platforms, including iOS, Android, web, and desktop. Flutter provides a seamless user experience by offering widgets for Material Design (Android) and Cupertino (iOS) styles, ensuring a native look and feel across different platforms.

Flutter originated as an experiment by Google's Chrome browser team to build a fast-rendering engine that ignores traditional layout models. Widgets are the fundamental building blocks of Flutter applications, and everything is treated as a widget. This widget-centric approach simplifies layout by having each widget specify its layout model, resulting in optimized layout and performance gains.

Built using C, C++, Dart, and the Skia graphics engine, Flutter offers a unified object model where everything is a widget and provides its widgets rather than relying on platform-specific ones. Although Flutter is a fast and highly customizable tool, it has a relatively young ecosystem compared to alternatives like Multi-OS Engine and Kotlin/Native.

In contrast, Multi-OS Engine and Kotlin/Native communicate with the platform through native tools and widgets. While facilitating code sharing, they still require native development for each platform. On the other hand, Flutter employs its widgets and rendering mechanics, offering a high degree of customization and performance. The choice between Flutter and other tools depends on project requirements, team expertise, and platform-specific considerations [15][26][27][28].

2.2.3.3.NET Multi-platform App UI (MAUI)

.NET MAUI is a powerful framework that streamlines cross-platform development by allowing developers to write code once and deploy it seamlessly across multiple platforms, reducing development effort and promoting code reusability. Leveraging the foundation of Xamarin.Forms, MAUI inherits expertise in cross-platform development and utilizes Xamarin's extensive library of plugins, bindings, and NuGet packages within .NET MAUI applications. The framework offers platform flexibility, supporting iOS, Android, macOS, and Windows, allowing developers to reach a diverse audience without significant platform-specific modifications. MAUI embraces modern C# language features, incorporating the latest advancements in the .NET ecosystem and providing developers with productivity enhancements and language improvements from recent .NET releases.

One of MAUI's standout features is its adaptive UI and controls, automatically adjusting their appearance based on the platform and device characteristics. This ensures a native look and feel on each supported platform, enhancing the overall user experience. Furthermore, MAUI seamlessly integrates with popular development tools such as Visual Studio and Visual Studio Code, allowing developers to leverage familiar environments for coding, debugging, and testing their .NET MAUI applications. The framework also supports cross-platform libraries and packages, enabling sharing of code for common functionalities across different platforms. Adopting the Model-View-Update (MVU) architecture simplifies the management of application state, user interface, and updates, enhancing the maintainability and scalability of the codebase. In conclusion, .NET MAUI emerges as a robust solution, empowering developers to create high-quality, cross-platform applications efficiently across various devices and operating systems [29][30][31].

2.2.4 Database Technologies

Relational Databases: SQL-based databases that store data using table structures. Examples include MySQL, PostgreSQL, Oracle, and Microsoft SQL Server.

NoSQL Databases are non-relational databases with flexible schemas and different data structures. There are various types, such as document-based (MongoDB), column-based (Cassandra), and key-value-based (Redis) [32][33].

2.2.4.1 Relational Database Management Systems

Relational databases are a type of database that stores and manages data using a standard language called SQL (Structured Query Language). Its main features are:

- Table Structure: Data is stored in tables. Each table represents specific entities (for example, users and orders).

- Relationships: Relationships can be established between different tables. These relationships are usually determined using a unique key (primary key). For example, a user may have an order. This relationship can be established between the user's ID and the order's user ID.

- SQL Usage: Accessing, editing, adding, or deleting data is generally done using the SQL language. SQL is a widely used language to access and manipulate data in such databases.

- ACID Compliance: Relational databases comply with ACID (Atomicity, Consistency, Isolation, Durability) principles. This ensures the reliability and data integrity of the database. For example, successful completion of transactions, protection of data integrity, etc.

- Data Normalization: Relational databases often organize data using a process called data normalization. This ensures that data is stored consistently and effectively.

Relational databases are widely preferred due to their wide usage and the prevalence of their standard language, SQL. These databases are used in many areas, from corporate applications to websites, and financial systems to e-commerce platforms [34][35].

MSSQL

Microsoft SQL Server (MSSQL) is a database system utilized for storing data in websites or software applications. For instance, in a blog, various data such as articles, comments, user information, among others, can be stored using MSSQL. It stands as the most used database type on Windows-based servers and within various programming languages. Despite not being free, MSSQL is favored due to its provision of advanced and standout features to users [36].

What is MSSQL used for?

MSSQL serves as the database backbone for websites and web software built using the .NET or ASP programming languages within the Windows environment. Connecting to and managing operations on an MS SQL database is notably more straightforward compared to several other programming languages [37].

SQL Server Management, a creation of Microsoft, functions as a database editor facilitating a wide array of data operations—such as editing, reporting, and analysis—through the utilization of T-SQL commands. These tools enable users to not only establish an MSSQL database but also craft its structure and configure essential settings, essentially engaging in the intricate process of database design.

What is T-SQL (Transact-SQL)?

T-SQL, known as Transact-SQL, is the query language utilized to execute various operationssuch as adding, modifying, querying, or deleting data—within the MS SQL Server database. While not a standalone programming language, it is a sub-language resembling a programming construct. This language structure also resembles other databases; for instance, in databases like MySQL and Oracle, you can perform queries using a comparable syntax [38].

PostgreSQL

PostgreSQL is a powerful, enterprise-level open-source relational database. It allows the use of relational SQL and non-relational JSON data and queries. PostgreSQL is backed by a robust community. It's an extremely reliable database management system offers excellent support, security, and accuracy. Several mobile and web applications utilize PostgreSQL as their default database. Many geospatial and analytic solutions also benefit from PostgreSQL. The latest version is PostgreSQL 15 [39].

GENERAL FEATURES

PostgreSQL's popularity is largely due to its features. The database assists in application development while maintaining data integrity, enabling administrators to create robust, error-resistant environments. It's versatile across various platforms and supports all common programming languages. We'll see the full list later. The database also offers an advanced locking system and supports concurrency control with various versions. The PostgreSQL database server also possesses mature server-side programming functionalities. It complies with the ANSI SQL specification and fully supports client-server network architecture. Furthermore, PostgreSQL provides high availability and a backup server. It's ANSI-SQL2008 compliant and object-oriented. Its ability to connect to other data warehouses, like NoSQL, as a unified center for multilingual systems is enabled by the database's JSON support. Information within a database cluster is always managed by a PostgreSQL instance. The database cluster is a group of records held in the same location on the file system.

How PostgreSQL differs from SQL?

We've seen that PostgreSQL supports the latest versions of SQL. But how exactly do they differ? Oracle Corporation owns MySQL, which has various premium versions requiring user payment. In contrast, PostgreSQL is a free and open-source database. Unlike PostgreSQL, MySQL is fully ACID compliant only when used with NDB and InnoDB Cluster Collection engines. MySQL performs well in scenarios like OLAP and OLTP applications, where read performance is the key factor. However, PostgreSQL's performance is optimal for applications requiring complex query processing. MySQL struggles with challenging business intelligence projects, whereas PostgreSQL excels in analytical and storage applications.

2.2.4.2 NoSQL

NoSQL database technology easily stores data in flexible, scalable schemas. For decades, the dominant data model in application development stored data in tables comprising rows and columns, known as the relational data model. Structured Query Language (SQL) was used to create and manipulate these relational tables. The significant adoption and use of other flexible data models began in the mid to late 2000s, leading to the term NoSQL, distinguishing these new database and data model classes from others.

What are the advantages of NoSQL databases?

Modern applications face various challenges that can be addressed by NoSQL databases. For instance, applications handle large volumes of data from diverse sources like social media, smart sensors, and third-party databases. Not all this varied data fits perfectly into the relational model. Implementing table structures can lead to issues like redundancy, data replication, and performance problems at a large scale. NoSQL databases are specifically designed for non-relational data models and offer flexible schemas for building modern applications. They have gained broad acceptance due to their ease of development at scale, functionality, and performance. The benefits of NoSQL databases are listed below [40].

Flexibility

NoSQL databases are known for their adaptable schemas, facilitating quicker and iterative software development. Their versatility in handling semi-structured and unstructured data renders them well-suited for various data models.

Scalability

The design of NoSQL databases focuses on scalability through the expansion of distributed hardware clusters rather than relying on costly and robust servers. In certain cases, cloud providers handle this scaling as a seamlessly managed service in the background.

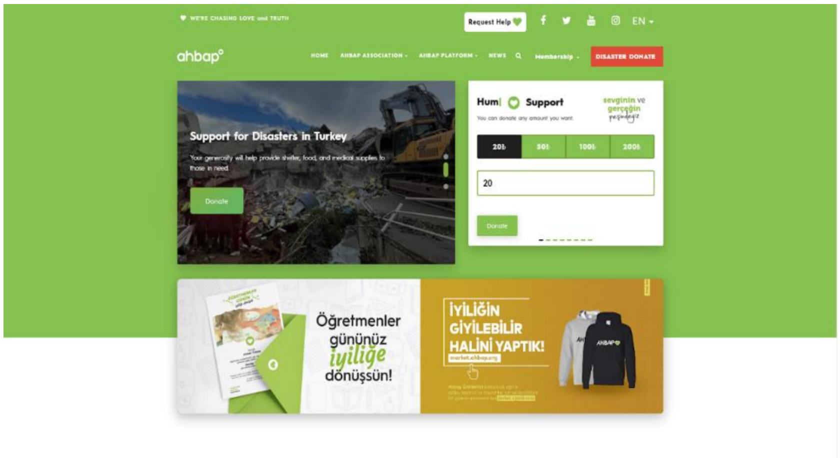
High Performance

NoSQL databases are finely tuned for specific data models and access methods, delivering superior performance in comparison to executing analogous functions within relational databases. Furthermore, these databases present robust APIs and tailored data types meticulously crafted to suit each relevant data model, contributing significantly to their overall functionality.

2.3Similar Projects/Systems

2.3.1Ahbap

Ahbap is a non-governmental organization founded by musician and philanthropist Haluk Levent (see Figure 1 and 2). As a solidarity-based platform, Ahbap is involved in various areas, including emergency assistance and search and rescue operations, healthcare services, basic needs support, and student scholarships. Additionally, Ahbap conducts animal rights, humanitarian aid, and natural disaster coordination activities. Ahbap is recognized as a charitable platform that upholds principles of social solidarity and valuing human life. On the homepage of Ahbap.org, there are direct call-to-action buttons for those who wish to make donations, labeled as "Donate," and for those seeking assistance, labeled as "Request Help." Additionally, recent news related to current events is displayed to provide opportunities for making donations. To request help, you need to sign up on the website and provide some information, but donating has been simplified for everyone, requiring only an email address and a phone number.During the final step of the donation process, donors are asked to accept certain agreements and provide their card information [41].



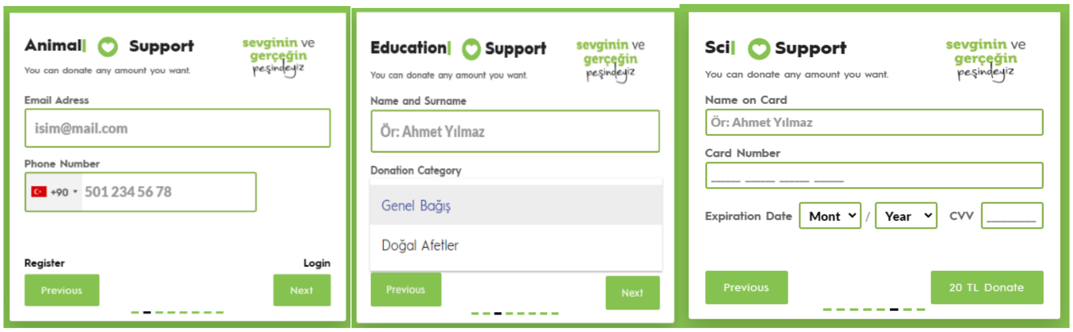
Support for Disasters in Turkey

Your generosity will help provide shelter, food, and medical supplies to those in need.

You can donate any amount you want

20

Figure 1.Screenshot from the Ahbap website homepage.



Animal| Support

You can donate any amount you want.

Email Adress

isim@mail.com

Phone Number

+90 501 234 56 78

Education| Support

You can donate any amount you want.

Name and Surname

Ör: Ahmet Yılmaz

Donation Category

Genel Bağış

Doğal Afetler

Sci| Support

You can donate any amount you want.

Name on Card

Ör: Ahmet Yılmaz

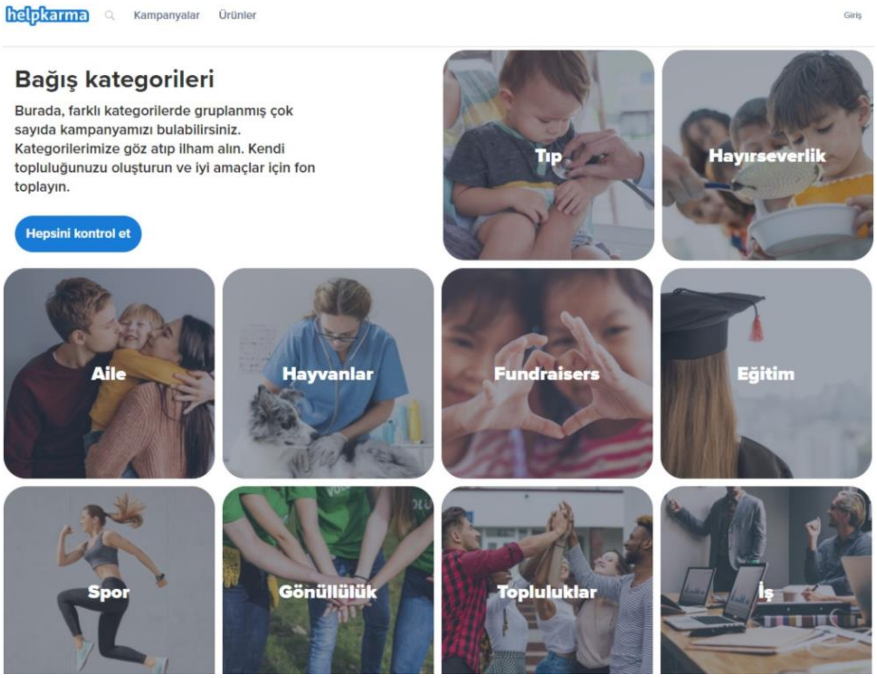
Card Number

Expiration Date Mont / Year CVV

Figure 2. Screenshot of the 'Donate' section from the Ahbap website homepage.

2.3.2HelpKarma

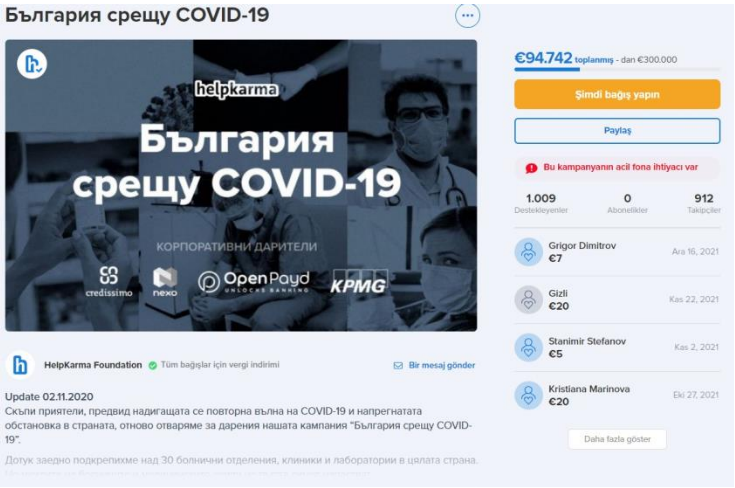
The aim of this platform is to create an effective donation culture by bringing together donors and those in need (see Figure 3, 4, and 5). The main goals set in the project include increasing community donations,providing easy access to those in need, ensuring trust and transparency, and facilitating the donation process using technology. The goal of increasing community giving aims to encourage a variety of individuals, organizations, and companies to donate, supported by donor incentives in different categories. In this way, it is aimed to support projects that will contribute to the general welfare of the society [42].



Bağış kategorileri

Burada, farklı kategorilerde gruplanmış çok sayıda kampanyamızı bulabilirsiniz. Kategorilerimize göz atıp ilham alın. Kendi topluluğunuzu oluşturun ve iyi amaçlar için fon toplayın.

Figure 3. Screenshot ofHelpKarma application homepage.



България срещу COVID-19

€94.742 toplanmış - dan €300.000

Bu kampanyanın acil fona ihtiyacı var

1.009	0	912
Destekleyenler	Abonelikler	Takipçiler

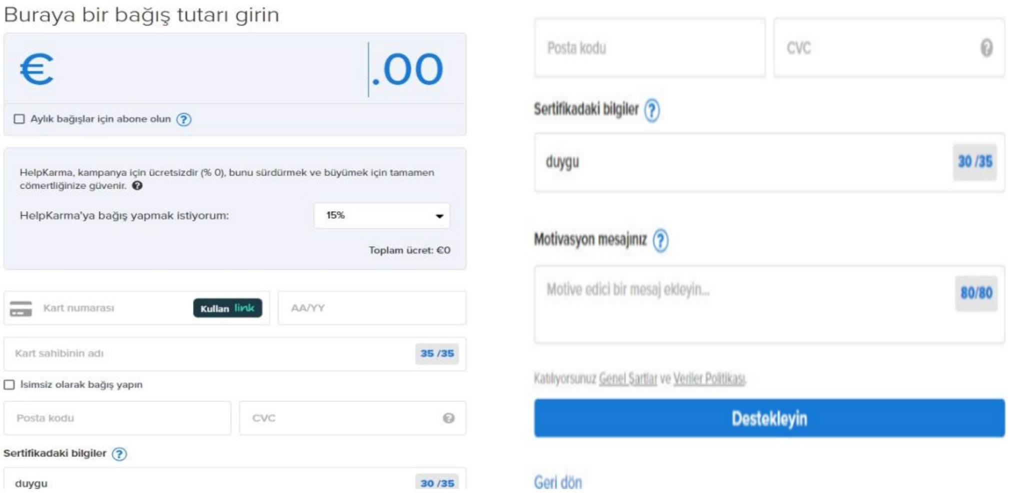
Grigor Dimitrov €7	Ara 16, 2021
Gizli €20	Kas 22, 2021
Stanimir Stefanov €5	Kas 2, 2021
Kristiana Marinova €20	Eki 27, 2021

HelpKarma Foundation ✓ Tüm bağışlar için vergi indirimi

Update 02.11.2020
Скъпи приятели, предвид надигащата се повторна вълна на COVID-19 и напрегнатата обстановка в страната, отново отваряме за дарения нашата кампания "България срещу COVID-19".

Дотук заедно подкрепихме над 30 болнични отделения, клиники и лаборатории в цялата страна.

Figure 4. Screenshot of sample donation information page.



Buraya bir bağış tutarı girin

€ .00

□ Aylık bağışlar için abone olun ?

HelpKarma, kampanya için ücretsizdir (% 0), bunu sürdürmek ve büyümek için tamamen cömertliğinize güvenir. ?

HelpKarma'ya bağış yapmak istiyorum: 15%

Toplam ücret: €0

Kart numarası | AA/YY

Kart sahibinin adı 35 /35

□ İsimsiz olarak bağış yapın

Posta kodu | CVC

Sertifikadaki bilgiler ?

duygu 30 /35

Posta kodu | CVC

Sertifikadaki bilgiler ?

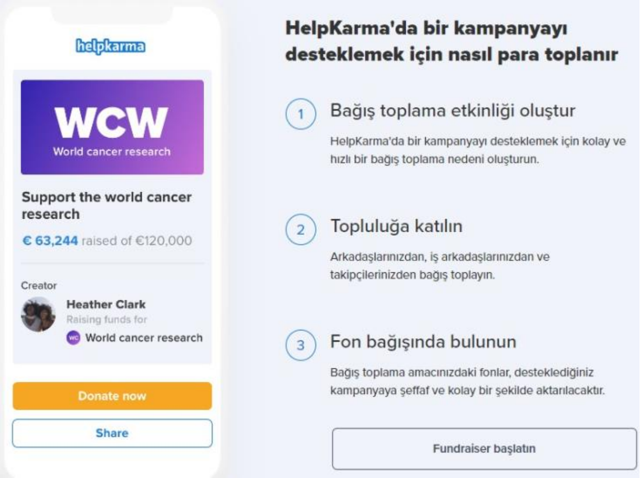
duygu 30 /35

Motivasyon mesajınız ?

Motive edici bir mesaj ekleyin... 80/80

Kabul ediyorsunuz Genel Şartlar ve Veriler Politikası

Figure 5. Screenshots of payment page.



helpkarma

WCW

World cancer research

Support the world cancer research

€ 63,244 raised of €120,000

Creator

Heather Clark

Raising funds for

World cancer research

Donate now

Share

HelpKarma'da bir kampanyayı desteklemek için nasıl para toplanır

1 Bağış toplama etkinliği oluştur

HelpKarma'da bir kampanyayı desteklemek için kolay ve hızlı bir bağış toplama nedeni oluşturun.

2 Topluluğa katılın

Arkadaşlarınızdan, iş arkadaşlarınızdan ve takipçilerinizden bağış toplayın.

3 Fon bağışında bulunun

Bağış toplama amacınızdaki fonlar, desteklediğiniz kampanyaya şeffaf ve kolay bir şekilde aktarılacaktır.

Fundraiser başlatın

Figure 6. Screenshot of information page.

2.3.3 GoFundMe

GoFundMe is an online platform designed for individuals and groups aiming to raise money for various purposes (see Figure 7, 8, and 9). This platform allows users to launch fundraising campaigns for personal goals, community projects, or urgent needs and receive donations from supporters. For instance, an individual can start a campaign to cover their healthcare expenses, while someone affected by a disaster or in urgent need can organize a campaign for immediate assistance. Similarly, a school or community can fundraise for specific purposes like educational programs or community projects. GoFundMe enables users to create, promote, and gather donations for their campaigns through social media or other communication channels. Donors can contribute to the campaigns they choose, and the funds raised through this platform are typically directed toward a specific purpose. This platform fosters a culture of social support and solidarity by facilitating people to help each other, supporting communities, and coming together to meet various needs [43].

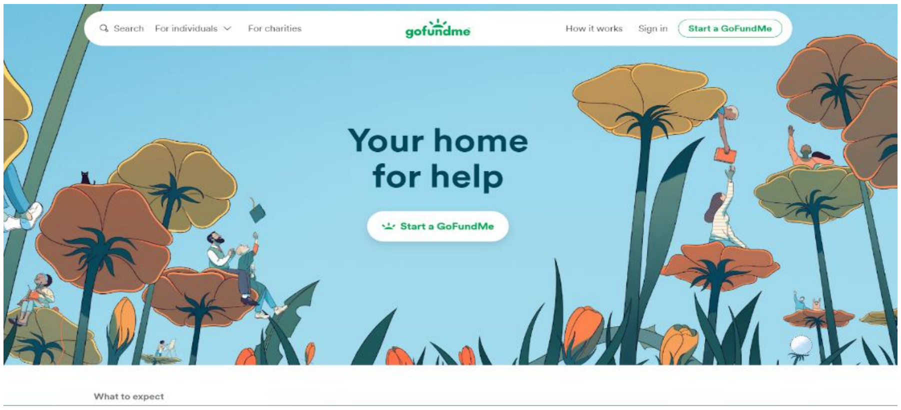
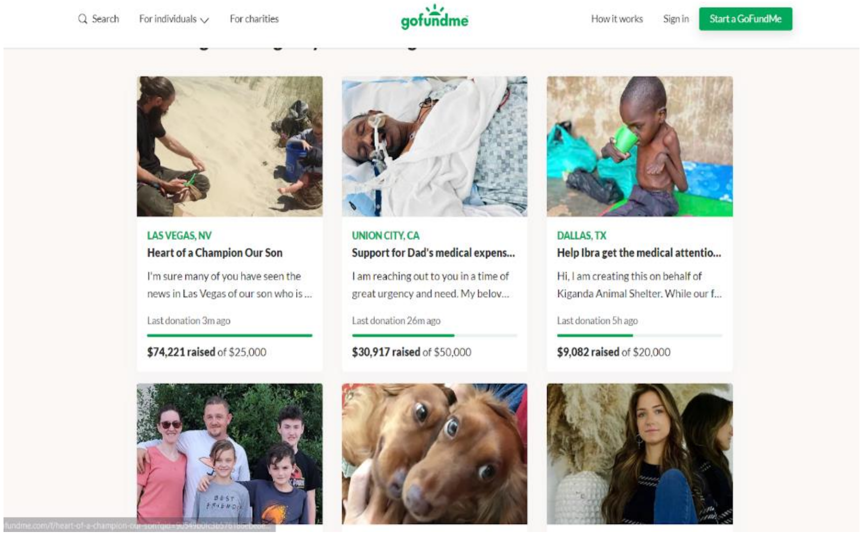


Figure 7. Screenshot of Main page.

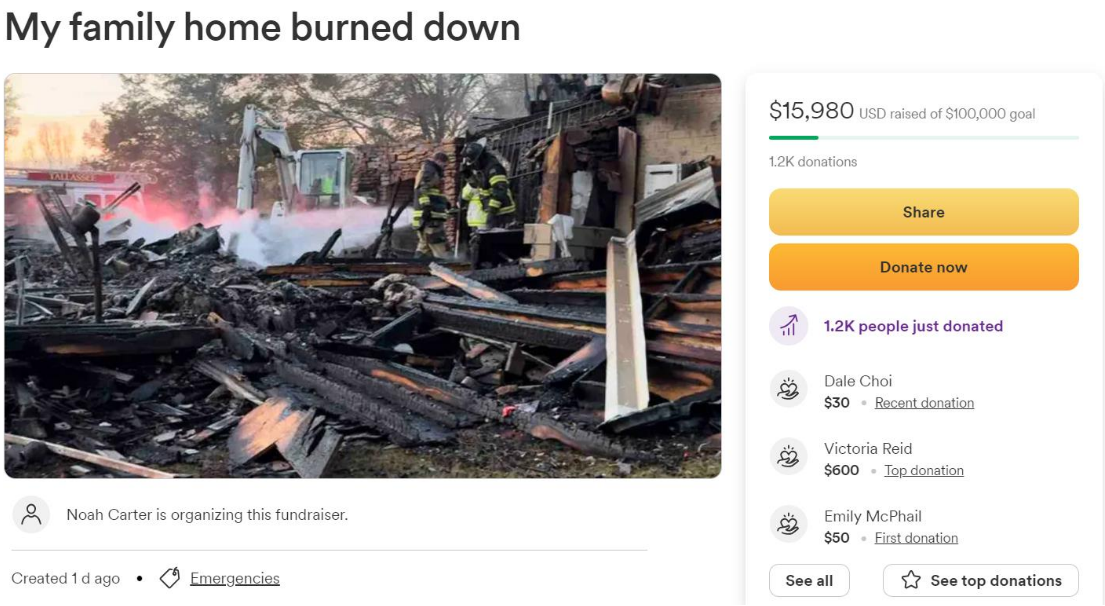


LAS VEGAS, NV
Heart of a Champion Our Son
I'm sure many of you have seen the news in Las Vegas of our son who is ...
Last donation 3m ago
$74,221 raised of $25,000

UNION CITY, CA
Support for Dad's medical expens...
I am reaching out to you in a time of great urgency and need. My belov...
Last donation 26m ago
$30,917 raised of $50,000

DALLAS, TX
Help Ibra get the medical attentio...
Hi, I am creating this on behalf of Kiganda Animal Shelter. While our f...
Last donation 5h ago
$9,082 raised of $20,000

Figure 8. Screenshot of Discover page.


My family home burned down

$15,980 USD raised of $100,000 goal
1.2K donations

1.2K people just donated

Dale Choi
$30 • Recent donation

Victoria Reid
$600 • Top donation

Emily McPhail
$50 • First donation

Noah Carter is organizing this fundraiser.

Created 1 d ago • Emergencies

Figure 9. Screenshot of donate page.

2.4 Summary

In summary, the results obtained from the literature review indicate that the BİNEL project can be implemented using various technologies. As exemplified by charitable platforms, incorporating different features can aid in assisting people and making the platform more unique. The information gathered from this literature review will be utilized to identify and meet the requirements for the development of the BİNEL project.

3 Software Requirement Specification

3.1 Introduction

3.1.1 Purpose

This Software Requirements Specification (SRS) document outlines the comprehensive set of requirements for the Binel Project, an integrated web platform and mobile application designed for both Android and iOS utilizing .NET Multi-platform App UI (MAUI). Binel is a sophisticated platform that seamlessly combines mutual aid and social interaction, drawing parallels to Twitter. The primary objective is to deliver a highly intuitive, feature-rich application that enables users to make and receive donations, explore user and organizational profiles, and engage in post and repost functionalities.

3.1.2 Scope

The Binel Project spans a web platform and mobile applications on Android and iOS, leveraging .NET MAUI for cross-platform compatibility. The application boasts many features, including a dynamic Home page, streamlined donation capabilities, intricate user and organizational profile pages, and an interactive post and repost system. The project's scope is not only to mimic the familiarity of Twitter but also to enhance the user experience through innovative features and a visually appealing design.

3.1.3 Document Conventions

The document will follow established naming conventions, utilize standard terminology, and adhere to formatting guidelines to maintain a clear and consistent presentation.

3.1.4 Glossary

- **Binel Project:** An intricate web and mobile platform designed for mutual aid and social interaction.
- **.NET MAUI:** A powerful cross-platform framework facilitating the development of applications for Android, iOS, and other platforms.

- **Multiplatform Application:** A software application designed to work seamlessly across different computing platforms. In the context of the Binel Project, .NET Multi-platform App UI (MAUI) is utilized for cross-platform compatibility, enabling usage on Android, iOS, and other platforms.
- **Home Page:** The central hub of the Binel application, offering a personalized feed, relevant information, and a gateway to various functionalities.
- **Post/Repost:** Advanced content creation and sharing capabilities within the Binel platform, fostering dynamic user engagement.
- **Profile Pages:** Robust and detailed pages showcasing individual and organizational information, promoting transparency and user connection.

3.1.5 Intended Audience

The Binel Project Software Requirements Specification (SRS) is primarily tailored for individuals and entities contributing to the development, funding, and utilization of the Binel platform. The key audience includes:

Donors: Individuals, organizations, and entities interested in contributing to the Binel platform, either through financial support or in-kind donations.

General Public: Everyday citizens who may use the Binel platform for mutual aid, social interaction, and engagement with various functionalities.

End Users: Individuals, both on an individual and organizational level, who will directly interact with the Binel platform through web and mobile applications.

Community Organizations: Non-profits, community groups, and organizations involved in mutual aid and social initiatives, utilizing Binel as a platform for outreach and engagement.

Project Supporters: Individuals who advocate for and support the Binel Project, contributing to its success through word-of-mouth promotion and awareness.

Government Agencies: Entities interested in or collaborating with Binel to support community welfare and engagement initiatives.

3.2 Overall Description

3.2.1 Product Perspective

Binel operates as a sophisticated multiplatform application, leveraging the capabilities of .NET MAUI for consistent user experiences across Android and iOS devices. The application features an intelligently designed Home page, providing users with a personalized feed and easy access to features such as donation functionalities, user and organizational profile pages, and dynamic post and repost capabilities. The user interface draws inspiration from the familiarity of Twitter,combining it with innovative elements for an enriched user experience.

3.2.2 Product Features

Multiplatform Applications:

The Binel platform is designed to offer a range of features that enhance user engagement, accessibility, and functionality. Among these features, the Multiplatform Applications component plays a pivotal role in ensuring a seamless user experience across different devices and operating systems.

Cross-Platform Compatibility:

Binel utilizes .NET Multi-platform App UI (MAUI) to create applications that run on various platforms, including Android and iOS. The cross-platform compatibility ensures that users can access Binel seamlessly, regardless of their preferred device or operating system.

Consistent User Interface:

The use of .NET MAUI facilitates the development of a consistent user interface across different platforms. Users will experience a unified design and navigation, fostering familiarity and ease of use.

Device-Specific Optimization:

The Binel application is optimized to leverage device-specific features, such as cameras for QR code scanning on mobile devices. This optimization enhances the user experience by utilizing platform-specific capabilities.

Responsive Design:

Binel's user interface is designed to be responsive and adaptive, ensuring optimal viewing and interaction on a variety of screen sizes and resolutions. Users will have a visually pleasing experience, whether they access Binel on a desktop, laptop, tablet, or mobile device.

Unified Functionality:

Regardless of the platform, users can access the full range of Binel functionalities, including donation capabilities, profile management, and post/repost interactions.

This unified functionality promotes a consistent user experience and ensures that users can engage with the platform seamlessly.

The Multiplatform Applications feature is integral to Binel's goal of providing a versatile and user-friendly platform that can be accessed by a broad audience. Through the use of .NET MAUI and thoughtful design considerations, Binel aims to deliver a cohesive and consistent experience across diverse devices and operating systems.

3.2.3 User Classes and Characteristics

In the Binel Project, various user classes exist, each with distinct characteristics and roles. Understanding these user classes is crucial for tailoring the platform to meet the diverse needs of its audience.

Individual Users:

Characteristics:

- Engage with the platform on a personal level.
- Utilize Binel for individual donations, social interaction, and content creation.
- Access personalized feeds, profiles, and donation histories.

Corporate Users:

Characteristics:

- Represent organizations, companies, or institutions on Binel.
- Engage in corporate donations, social interactions, and content sharing.
- Access organizational profiles, donation records, and engagement metrics.

Community Organizations:

Characteristics:

- Non-profits, community groups, and entities promoting mutual aid.
- Utilize Binel for fundraising, outreach, and community engagement.
- Access detailed profiles, donation histories, and user interactions.

Understanding the diverse user classes and their characteristics is fundamental for tailoring the Binel platform to meet the unique requirements and expectations of each group. This user-centric approach ensures that Binel effectively serves the needs of both individual and organizational users while providing a comprehensive and inclusive social interaction and donation platform.

3.2.4 Operating Environments

The operating environment for the Binel platform encompasses the hardware, software, and network components that collectively support its seamless functionality. Understanding and optimizing this environment is crucial for ensuring the reliability and performance of the Binel web platform and mobile applications.

Hardware Requirements:

Web Platform:

- Binel is designed to operate efficiently on standard desktops and laptops.
- Minimum requirements include a modern processor, sufficient RAM, and a stable internet connection.

Mobile Applications (Android and iOS):

- Compatible with a range of mobile devices, including smartphones and tablets.
- Utilizes device features such as cameras for QR code scanning and touch interfaces for intuitive navigation.

Software Requirements:

Operating Systems:

- Binel mobile applications are compatible with Android and iOS operating systems.
- The web platform supports major web browsers, including Chrome, Firefox, Safari, and Edge.

Frameworks and Libraries:

- Developed using .NET Multi-platform App UI (MAUI) for cross-platform compatibility.
- Integrates with third-party frameworks and libraries for enhanced functionality.

Database System:

Binel relies on a robust database system to securely store user profiles, donation records, and application data.

The database system must support efficient data retrieval and storage operations to ensure optimal platform performance.

Network Infrastructure:

Binel requires a stable and secure network connection for real-time interactions and updates. Implements secure communication protocols (HTTPS) to safeguard user data during transmission.

Development and Testing Tools:

Developers utilize integrated development environments (IDEs) for coding and testing.

Version control systems (e.g., Git) are employed to manage code changes and collaboration among the development team.

Third-Party Integrations:

Binel integrates with third-party APIs for additional features, such as payment processing and social media connectivity.

Seamless compatibility with external services is essential for uninterrupted operation.

The operating environment described above provides the foundation for Binel's cross-platform capabilities, security measures, and overall system performance. Adherence to these requirements ensures that users experience a reliable, secure, and feature-rich interaction with the Binel platform across different devices and operating systems.

3.2.5 Design and Implementation Constraints

The Binel platform operates within a set of constraints that shape its design and implementation. These constraints, while influencing various aspects of the project, are essential considerations for stakeholders.

Cross-Platform Development

Constraint: The development approach relies on .NET Multi-platform App UI (MAUI) for cross-platform compatibility.

Impact: The evolution of the .NET MAUI framework may influence development timelines and the integration of new features.

Third-Party API Dependencies

Constraint: Integration with third-party APIs for payment processing and social media connectivity.

Impact: Reliance on external services introduces potential dependencies and requires vigilant monitoring for changes in API functionality.

Security Considerations

Constraint: The platform's security measures, including HTTPS for data transmission and compliance with payment security standards.

Impact: While ensuring secure operations, security measures may introduce a slight performance overhead, necessitating continuous monitoring.

Database System

Constraint: Dependence on a specific database system for secure storage of user profiles, donation records, and application data.

Impact: Compatibility considerations with the chosen database system and potential scalability limitations must be addressed.

User Interface Design

Constraint: Balancing innovative design with familiarity, drawing inspiration from Twitter while introducing unique elements.

Impact: Iterative design processes and feedback loops are crucial to achieving a user interface that strikes the right balance and gains user acceptance.

Agile Development Methodology

Constraint: Binel follows an agile development methodology, emphasizing adaptability and continuous improvement.

Impact: Frequent iterations and adjustments based on stakeholder feedback may result in evolving requirements throughout the development process.

Resource Constraints

Constraint: Resource limitations, including the size of the development team, budget constraints, and time restrictions.

Impact: Balancing feature development, testing, and project timelines within resource constraints may influence the overall project scope.

Technological Accessibility

Constraint: Ensuring that the Binel platform is accessible to users with diverse technological capabilities and devices.

Impact: Incorporating design considerations and testing procedures to accommodate users with varying technological accessibilities.

Compatibility Across Various Platforms

Constraint: Binel must be compatible with various platforms, including web browsers, Android, and iOS devices.

Impact: Rigorous testing and optimization efforts to ensure consistent functionality and user experience across diverse platforms.

Adherence to Educational Standards and Regulations

Constraint: Compliance with educational standards and regulations relevant to the Binel platform's educational aspects.

Impact: Additional considerations and potential modifications to align with educational standards, ensuring a responsible and compliant platform.

Budget and Time Constraints

Constraint: The Binel Project operates within defined budgetary limits and time constraints.

Impact: Strategic allocation of resources and meticulous project management to optimize development progress within the specified budget and timeline.

Optimize for Diverse User Groups

Constraint: The platform must be optimized to cater to the diverse needs and preferences of various user groups.

Impact: User-centric design and feature prioritization to create an inclusive and engaging experience for a broad spectrum of users. Understanding and navigating these constraints collectively contribute to the successful realization of the Binel platform, ensuring it meets user expectations, regulatory standards, and operational efficiency within the specified constraints.

3.3 Functional Requirements

3.3.1 Description

Functional requirements define the specific behaviors, features, and interactions of the Binel platform. These requirements focus on what the system must do to meet the needs of its users and stakeholders.

3.3.1.1 Inputs

User Registration Information:

Input: User provides registration information, including username, password, email address, and additional profile details.

Purpose: To create a user account and establish user identity within the Binel platform.

Donation Details:

Input: Donor specifies donation details, such as donation amount, recipient (user or organization), and optional personalized message.

Purpose: To facilitate the process of making donations on the platform.

Post and Repost Content:

Input: Users input text, media files, or links when creating or reposting content.

Purpose: To enable users to share information, updates, or stories with the Binel community.

Profile Information:

Input: Users and organizations provide or update profile information, including descriptions, images, and links.

Purpose: To showcase user and organizational details on profile pages for transparency and connection.

Administrative Commands:

Input: Authorized administrators may input commands related to system management, content moderation, and user support.

Purpose: To manage and maintain the Binel platform efficiently.

3.3.1.2 Outputs

User Registration Confirmation:

Output: Confirmation message and/or email sent to the user upon successful registration.

Purpose: To inform users that their registration was successful.

Donation Acknowledgment:

Output: Acknowledgment message sent to the donor and recipient upon successful donation.

Purpose: To confirm and express gratitude for the donation.

Posted and Reposted Content:

Output: Shared content appears on the user's profile and in the feeds of users who follow them.

Purpose: To distribute user-generated content and foster community engagement.

Updated Profile Information:

Output: Updated profile information is displayed on the user's or organization's profile page.

Purpose: To reflect changes in user or organizational details for transparency.

System Status and Notifications:

Output: System status messages and notifications for administrators regarding user activities, content reports, and platform health.

Purpose: To keep administrators informed and facilitate effective platform management.

3.3.1.3 Dependices

User Authentication Service:

Dependency: The system relies on a secure and reliable user authentication service to validate user credentials during registration and login processes.

Payment Processing API:

Dependency: The Binel platform integrates with a payment processing API to facilitate secure and efficient donation transactions.

External Content Hosting Services:

Dependency: For media content, the platform may utilize external hosting services to store and retrieve images, videos, or other media files.

Network Infrastructure:

Dependency: The platform's functionality depends on a stable and secure network infrastructure to ensure real-time interactions and updates.

Database Management System:

Dependency: The platform relies on a robust database management system to store and retrieve user profiles, donation records, and application data securely.

These inputs, outputs, and dependencies collectively define the functional aspects of the Binel platform, ensuring that it operates effectively and meets the expectations of its users and stakeholders.

3.4 Non-functional Requirements

3.4.1 Performance Requirements

Response Time:

The Binel platform shall prioritize quick response times, ensuring that user interactions receive a system response within a maximum of 2 seconds under normal load conditions. This commitment to rapid response aims to create a seamless and efficient user experience, minimizing any delays or interruptions during interactions with the platform.

Simultaneous User Capacity:

To accommodate a diverse user base, the system must support a minimum of 1000 concurrent users during peak usage hours. This high simultaneous user capacity ensures that the platform can handle significant user traffic without compromising performance, guaranteeing accessibility even during periods of heightened demand.

Loading Time:

The web and mobile applications of Binel should load swiftly, targeting a loading time of within 3 seconds on standard internet connections. Fast loading times are crucial for enhancing user satisfaction, reducing bounce rates, and fostering a positive user experience by minimizing wait times.

Frame Rate:

The mobile application's visual appeal will be maintained by ensuring a consistent frame rate of at least 30 frames per second (fps). This commitment to a smooth frame rate contributes to an engaging and visually appealing user interface, ensuring that animations and transitions are seamless and responsive.

Data Processing Time:

Efficient data processing is fundamental, and the backend of the Binel platform should process and retrieve user data within a maximum of 1 second. This swift data processing time is essential for providing real-time information to users, contributing to the overall responsiveness and effectiveness of the platform.

Cross-Platform Compatibility:

Binel shall exhibit cross-platform compatibility, supporting major web browsers (Chrome, Firefox, Safari) and mobile platforms (iOS, Android). This ensures a consistent and accessible user experience across various devices and browsers, expanding the platform's reach and accessibility to a wider audience.

Reliability and Uptime:

Aiming for a minimum of 99.99% uptime over a one-year period, including scheduled maintenance, demonstrates Binel's commitment to reliability. High reliability and uptime are critical for maintaining continuous availability, instilling trust in users and ensuring the platform is accessible whenever needed.

3.4.2 Security Requirements

Data Encryption:

All sensitive user data, including personal information and financial transactions, must be encrypted using industry-standard encryption algorithms during transmission and storage.

User Authentication:

Secure authentication mechanisms, such as multi-factor authentication, shall be implemented to ensure that only authorized users have access to their accounts and sensitive functionalities.

Authorization Controls:

Role-based access controls (RBAC) shall be enforced to restrict access to administrative features, ensuring that only authorized personnel can perform system management tasks.

Secure APIs:

APIs for third-party integrations shall implement secure communication protocols (HTTPS) to protect against unauthorized access and data breaches.

Regular Security Audits:

Regular security audits and vulnerability assessments shall be conducted to identify and address potential security threats. Updates and patches will be quickly applied to reduce security risks.

3.4.3 Usability Requirements

User Interface Consistency:

The user interface across the web and mobile applications shall maintain a consistent design, navigation, and interaction patterns, promoting a unified and intuitive user experience.

Accessibility:

The platform shall adhere to accessibility standards (e.g., WCAG) to ensure that users with disabilities can access and interact with the application. This includes providing alternative text for images, keyboard navigation, and other accessibility features.

Onboarding Process:

The onboarding process for new users shall be user-friendly and straightforward, guiding users through account creation, profile setup, and critical features of the platform.

Help and Support:

A comprehensive help and support system, including FAQs and in-app guidance, shall assist users in understanding platform features, making donations, and resolving issues.

3.4.4 Reliability and Availability

System Uptime:

The Binel platform shall maintain a minimum uptime of 99.9%, ensuring continuous availability for users. Scheduled maintenance activities should be communicated to users in advance.

Disaster Recovery:

A robust disaster recovery plan shall be in place to minimize downtime during system failures or data loss. Regular backups and recovery procedures will be tested and documented.

Redundancy:

Critical components of the system, such as databases and servers, shall be configured with redundancy to ensure fault tolerance and minimize service disruptions in case of hardware failures.

Monitoring and Alerts:

Proactive monitoring tools shall be implemented to detect performance issues, security breaches, or potential system failures. Automated alerts will be configured to notify the technical team promptly.

These non-functional requirements are essential for ensuring the Binel platform's performance, security, usability, and reliability, contributing to a positive user experience and the project's overall success.

3.5 System Models

3.5.1 Use Case Diagrams

Login Requirement Description & Use Case

Use Case:

Actors:

- Primary Actor:User (Individual) , User (Organization)
- Secondary Actor: System (for authentication)

Description:

Log in use case encapsulates the intricate process through which a user gains access to the Binel system by providing valid credentials—specifically, an email or mobile phone and password combination. Successful authentication grants the user entry into their individualized dashboard, empowering them to engage in various activities within the Binel platform.There are two options for user log in: individual users and organization users.

Preconditions:

- The Binel application is installed and running.
- The user has a registered account with a valid phone number or email address.

Main Flow:

- The user navigates to the Binel application's login page.
- The system prompts the user to enter their registered phone number or email address.
- The user provides the required information.
- The system requests the user's password.
- The user enters the password.
- The system verifies the provided credentials against the registered information.
- If the credentials are valid, the user is successfully logged in.
- The system grants access to the user's personalized dashboard and features.

Alternative Flow:

- Invalid Credentials:

  If the entered credentials are incorrect, the system notifies the user and provides an option to reset the password or try again.

Postconditions:

- The user gains access to the Binel platform upon successful login.
- The system remains secure, and the user is granted appropriate permissions.

Exceptions:

- Account Lockout:

After a certain number of unsuccessful login attempts, the system may temporarily lock the account for security reasons, and the user must follow a recovery process.

Diagram:

Figure 10. Illustrates the login system of the Binel application.

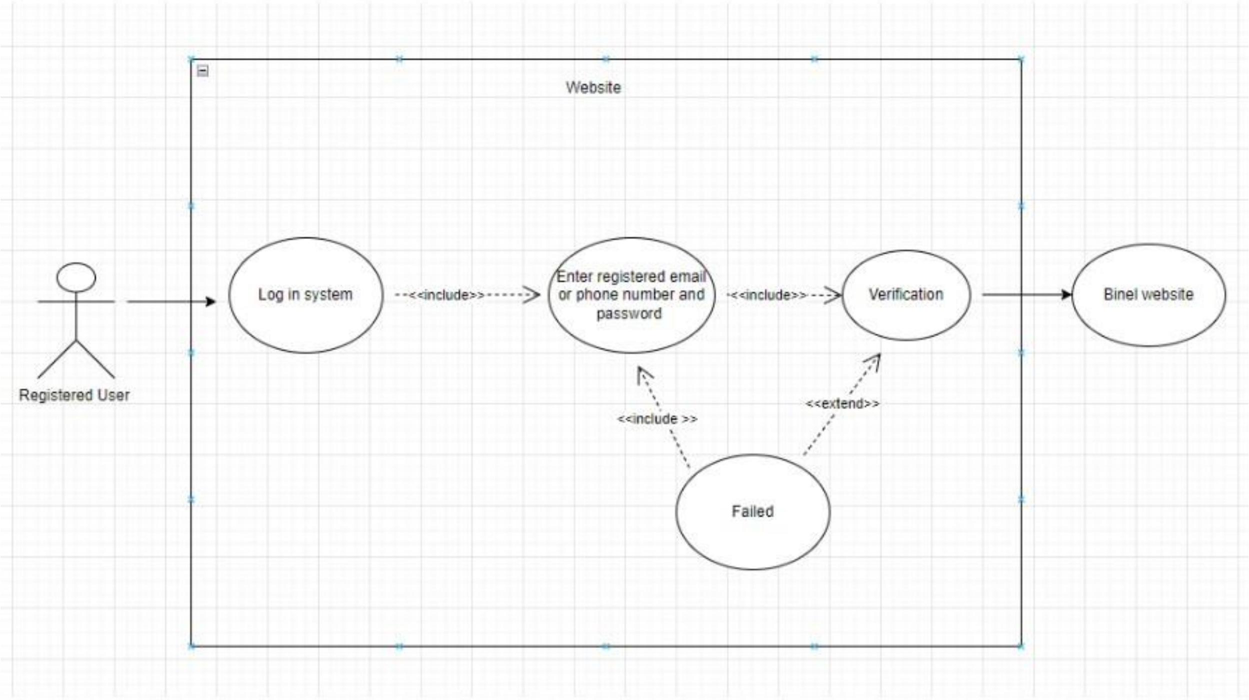


Figure 10. Login Requirement Use Case

Donate Requirement Description & Use Case

Use Case:

Actors:

- Registered user
- Payment System

Description:

In the payment use case section, the user wants to complete the payment process with the donation amount and motivation message user has determined for the donation platform user has chosen on the Binel platform.

Preconditions:

- The user is logged into the Binel platform.
- The user has selected a campaign or organization for donation.

Main Flow:

- The user selects the campaign or organization they want to donate to on the Binel platform.
- The user determines the donation amount.
- The user enters payment information (card information, certificate information).
- The user adds a motivational message.
- The user clicks on the "Donate" button.
- The payment system verifies the user's card information and processes the donation.
- The user is sent confirmation that the donation has been completed successfully.
- The user can see the details of his donation on the Binel platform.

Alternative Flow:

- User Enters Payment Information Incorrectly:

If the user enters the payment information incorrectly, the system informs the user about this and asks him to make corrections.

Postconditions:

- The user receives confirmation of a successful donation.
- The donation details are accessible to the user on the Binel platform.

Exceptions:

- The user can cancel the donation process at any stage.
- The payment system notifies the user if the donation amount cannot be withdrawn or if an error occurs.

Diagram:

Figure 11 illustrates the donation system of the Binel application.

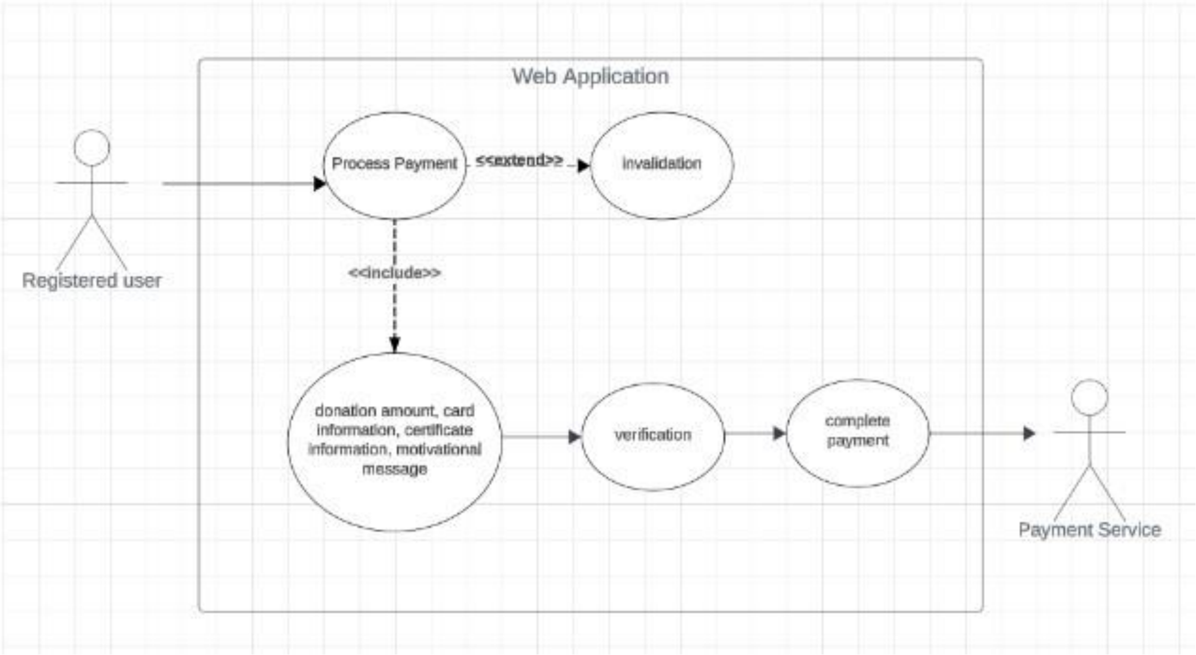


Figure 11. Donate Requirement Use Case

System Register Page Description & Use Case

Use Case:

Actors:

- User (Individual): An individual who wants to make a donation and perform personal transactions within the system.
- User (Organization): A representative user for a foundation or organization that will receive donations.
- System (For Authentication): The system managing the user authentication process.

System (Registration): The system responsible for managing the user registration process.

Description:

Register use case encapsulates the process through which a user becomes part of the Binel system by creating a valid account. This functionality is designed exclusively for users who intend to make a donation. Users accessing our application through mobile markets or our website will be directed to the registration page. The page is specifically designed for the creation of accounts for users who wish to contribute through donations. Accounts for foundations and organizations that will receive donations will be managed by administrator admins appointed by the system.

Preconditions:

- The Binel application is installed and actively running.
- The user has downloaded the application from mobile markets or accessed the website.
- The user possesses an active and valid mobile phone number or email address.

Main Flow:

- The user navigates to the registration page of the Binel application.
- The user completes the required personal information on the registration page, including Name, Surname, a valid email, a valid mobile phone number, a valid Citizenship ID, Birth Date, and Password.
- The system checks if the entered information matches any existing user accounts.
- Existing User: If there is a match, an error message is displayed, notifying the user that the registration cannot be completed. Additionally, a security notification is sent via email, and the user is directed to the login page.
- If no existing user is found, the system prompts the user to verify their identity through SMS or email.
- The user successfully completes the SMS or email verification process.

- Upon successful verification, the user is redirected to the login page.

Alternative Flow:

- Unsuccessful Verification: If the SMS or email verification fails, the system notifies the user and provides options to resend the verification or correct the information.

If the user enters the payment information incorrectly, the system informs the user about this and asks him to make corrections.

Postconditions:

- The user has a registered account in the Binel system.
- Successfully verified users are redirected to the login page for further access.

Exceptions:

Account Lockout:

- After three consecutive unsuccessful verification attempts, the user's account will be temporarily locked for 10 minutes. During this time, the user cannot attempt to create an account.
- Existing User during Registration: If the entered information matches an existing user account, an error message is displayed, notifying the user that the registration cannot be completed. Additionally, a security notification is sent via email, and the user is directed to the login page.

Diagram:

Figure 12 illustrates the register system of the Binel application.

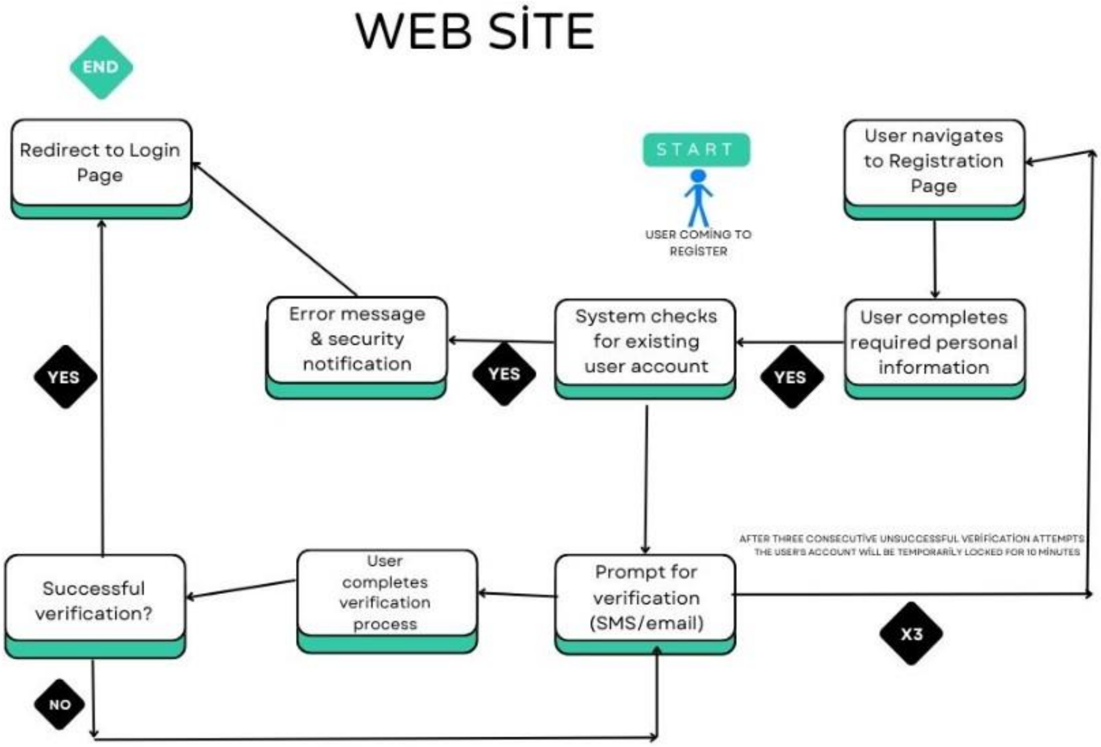

WEB SİTE
END
Redirect to Login Page
START
USER COMİNG TO REGİSTER
User navigates to Registration Page
Error message & security notification
System checks for existing user account
User completes required personal information
YES
YES
YES
AFTER THREE CONSECUTİVE UNSUCCESSFUL VERİFİCATİON ATTEMPTS
THE USER'S ACCOUNT WİLL BE TEMPORARİLY LOCKED FOR 10 MİNUTES
Successful verification?
User completes verification process
Prompt for verification (SMS/email)
X3
NO

Figure 12. System Register Page Use Case

Donate Post Sharing & Use Case

Use Case:

Actors:

- User (Individual): Individual donor.
- User (Organization): Organization receiving donations.

Description:

The Donate Post Sharing page provides a space for users to share certificates and posts related to their donations, allowing interaction with other users. During certificate sharing, measures are taken against inappropriate content and misuse. If inappropriate content is detected, the user is warned, and correction is expected. Additionally, accounts displaying continuous inappropriate behavior are permanently banned. To make a share, users must have made a successful donation within the last 7 days.

Preconditions:

- Binel application is installed and operational. The user has created an account and logged in. The user has made a successful donation within the last 7 days.

Main Flow:

- The user accesses the "Donate Post Sharing" page in the Binel application. To make a share, the user must have made a successful donation within the last 7 days.
- Donation Condition: If the user has not made a successful donation within the last 7 days, permission to share is denied, and the user is informed.
- Individual donors can create certificates and posts related to the organization they donated to. The shared content is reviewed by a moderation algorithm.
- Inappropriate Content: If the moderation algorithm detects inappropriate content, the user is warned, and correction is expected.
- Misuse: Accounts displaying continuous inappropriate and misuse behavior are permanently banned.
- Organizations receiving donations can share details of received donations. Users and organizations can like and comment on shares. Users can share posts on other social media platforms.
- Users can filter shares by categories.

Alternative Flow:

- Incomplete Information Entry: Description: If the user leaves donation certificate or details incomplete, Action: The system displays a warning and requests the addition of missing information. Inappropriate Content Detected: Description: If the moderation algorithm detects inappropriate content in the shared content, Action: The user is warned, and they are required to correct or change the content. Misuse Detected: Description: If continuous inappropriate and misuse behavior is detected in user accounts, Action: The user account is permanently banned.

Postconditions:

- If the user has made a successful donation and meets the donation conditions, the share is successfully completed. Users and organizations can like and comment on shares. Users can share posts on other social media platforms. Measures are taken in case of inappropriate content and misuse. Users can filter shares by categories.

Exceptions:

- Donation Condition Not Met: Description: If the user has not made a successful donation within the last 7 days, Action: Permission to share is denied, and the user is informed.

Diagram:

Figure 13 illustrates the donate post sharing system of the Binel application.

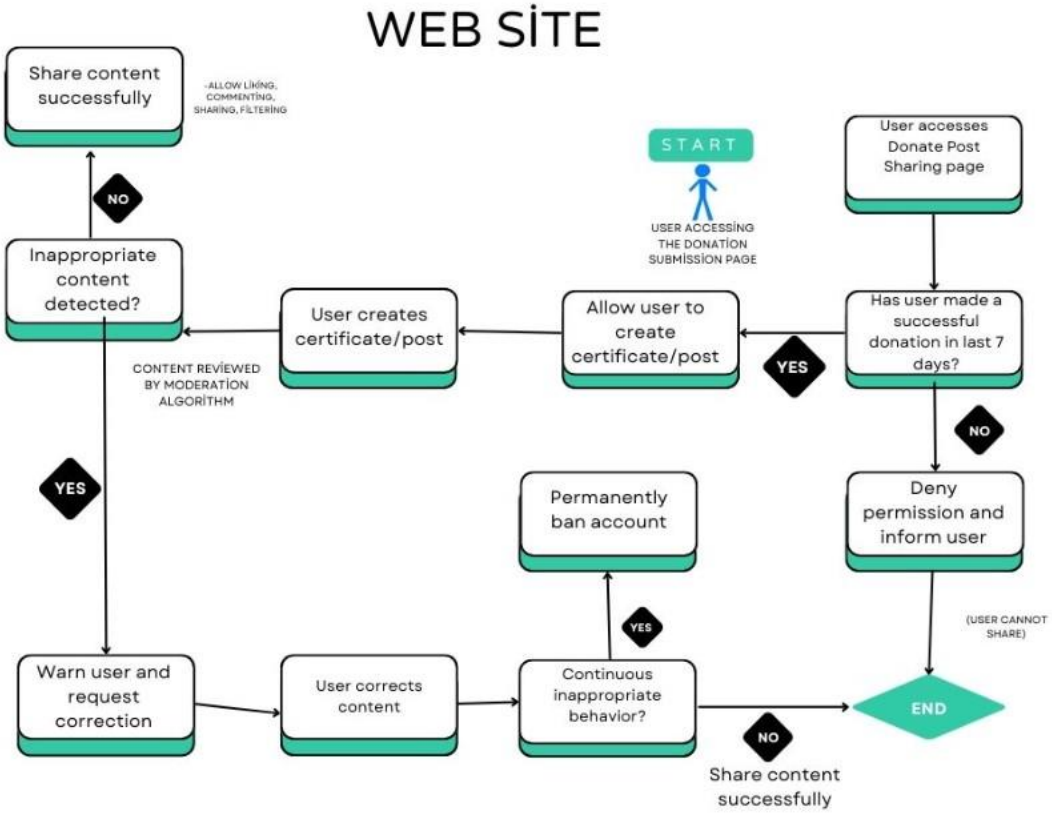

WEB SİTE
Share content successfully
-ALLOW LİKİNG, COMMENTİNG, SHARİNG, FİLTERİNG
START
USER ACCESSİNG THE DONATİON SUBMİSSİON PAGE
User accesses Donate Post Sharing page
NO
Inappropriate content detected?
User creates certificate/post
Allow user to create certificate/post
YES
Has user made a successful donation in last 7 days?
CONTENT REVİEWED BY MODERATİON ALGORİTHM
NO
YES
Permanently ban account
Deny permission and inform user
YES
(USER CANNOT SHARE)
Warn user and request correction
User corrects content
Continuous inappropriate behavior?
END
NO
Share content successfully

Figure 13. Donate Post Sharing Use Case

Normal Post Sharing Description & Use Case

Use Case:

Actors: Primary Actor: User (Organization) Secondary Actors: Binel System, External Social Media Platform

Description: This use case outlines the process of an organization user creating a post on the Binel web application, incorporating text, images, and other media elements. Additionally, the user has the option to seamlessly integrate content from an external social media platform, such as a video from YouTube, into their Binel post.

Preconditions:

- The Binel web application is accessible and running.
- The organization user has valid credentials (email address and password) for Binel.
- The organization user is successfully logged into the Binel web application.

Main Flow:

- The organization user navigates to the Binel web application and logs in using their registered email address and password.
- Upon successful authentication, the system grants access to the organization user's personalized dashboard.
- Within their dashboard, the organization user selects the "Create Post" button.
- The system presents content fields for text, images, and other media, allowing the organization user to input relevant information.
- Simultaneously, the organization user has the option to integrate content from an external social media platform.
- The user selects the "Add External Content" option and pastes the link or content of a video from the external platform.
- The system validates the entered content, checking for correctness and compliance with community guidelines and platform policies.
- If the content passes validation, the system proceeds to save the post information to the database.
- If there are any errors in the input data, the system provides an error message indicating the issue, such as invalid format for text, images, etc.
- In the case of external content integration, the system checks the connection to the external social media platform.
- If the connection is unsuccessful, the system notifies the organization user with an error message related to external content interaction or link connectivity issues.
- If there are no errors, the system saves the post information to the database and shares it on the organization user's profile page.

Postconditions:

- The organization user's post, created with text, images, and potentially integrated external content, is successfully published on the Binel web platform.
- The post complies with community guidelines and platform policies for organization users.
- Other users on the Binel web platform, including individual and organization users, can view, engage with, and respond to the shared post.

Exceptions: Invalid Content Format:

- If the organization user-provided content, such as text, images, etc., does not adhere to the required format, the system notifies the organization user with an error message.
- The organization user is prompted to correct the format issues before proceeding.

External Content Interaction Issue:

- If there is an issue with the organization user's interaction with external content or a problem with the link, the system notifies the organization user with an error message.
- The organization user is prompted to review the external content or connection and address any issues before proceeding.

Diagram:

Figure 14 illustrates the normal post sharing system of the Binel application.

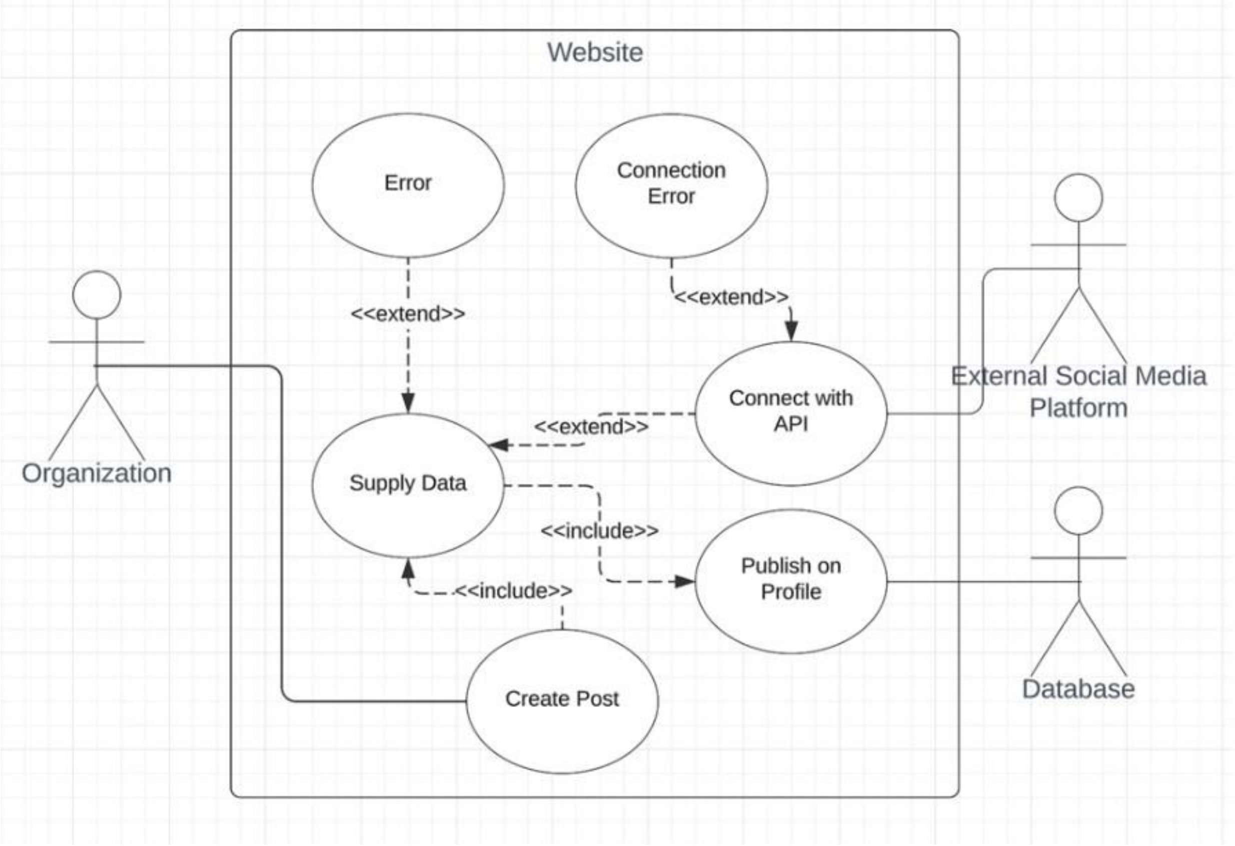


Figure 14. Normal Post Sharing Use Case

Search Description & Use Case

Use Case:

Actors: Primary Actor: Visitor Secondary Actor: Binel Database

Description: This use case outlines the process by which visitors, who are not logged in, can search and filter donation campaigns on the Binel web application based on keywords and color tags. The Binel Database plays a key role in retrieving and presenting the filtered campaign information for visitors.

Preconditions:

- The Binel web application is accessible and running.
- Donation campaigns with associated color tags have been created on the Binel platform.

Main Flow:

- The visitor accesses the Binel web application without the need for authentication.
- The visitor navigates to the campaign search and filtering section on the website.
- The system presents options for keyword search and color tag filtering.
- Keyword Search:
    - The visitor enters a specific term or keyword in the search bar.
    - The Binel Database is queried to filter and retrieve donation campaigns containing the entered keyword.
    - If no campaigns are found, the system displays a "Campaigns Not Found" error message.
- Color Tag Filtering:
    - The visitor selects a specific color tag associated with the type of assistance they are interested in (e.g., blue for animal-related campaigns).
    - The Binel Database is queried to filter and retrieve donation campaigns tagged with the selected color.
    - If no campaigns are found, the system displays a "Campaigns Not Found" error message.
- The visitor can combine both keyword search and color tag filtering to narrow down the campaign results.
- The Binel Database updates the campaign list based on the applied filters.

Alternative Flow: Invalid Input:

- If the visitor enters an invalid keyword or selects an unsupported color tag, the system provides an error message.
- The visitor is prompted to correct the input before reapplying the filters.

Postconditions:

- The visitor views a filtered list of donation campaigns based on their specified keyword and color tag filters.
- The campaigns displayed comply with the applied filters.

Exceptions: Campaigns Not Found:

- If no campaigns are found based on the applied filters, the system displays a "Campaigns Not Found" error message.
- The visitor is encouraged to modify their search criteria and try again.

Diagram:

Figure 15 illustrates the search system of the Binel application.

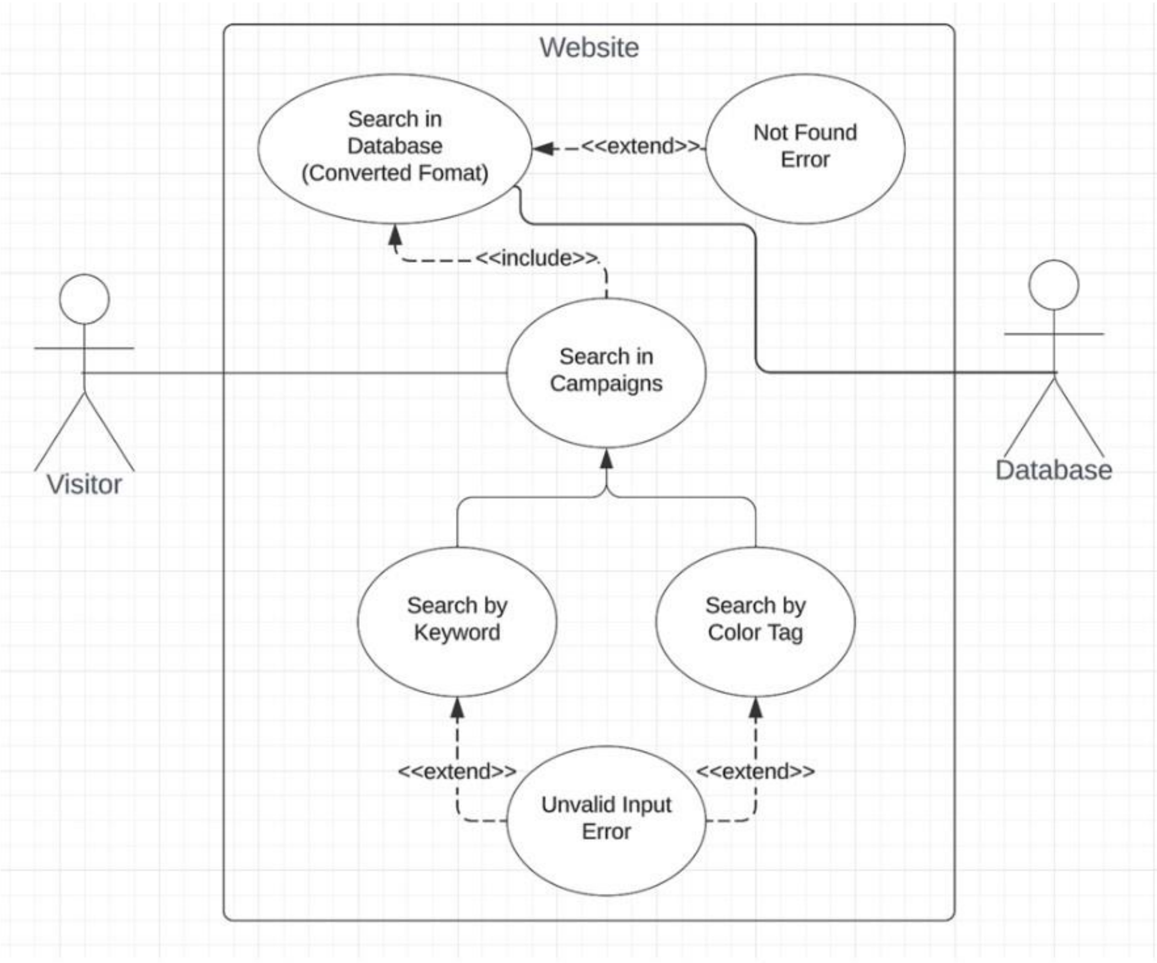


Figure 15. Search Use Case

3.6 Other Requirements

3.6.1 Documentation Requirements

System Architecture Documentation:

System Architecture Documentation for the Binel project is imperative in providing a comprehensive understanding of the system's structure. This includes detailed architectural diagrams showcasing components, modules, and their interactions. Furthermore, it encompasses a description of the technologies, frameworks, and libraries integral to the system architecture. The documentation delves into the intricacies of data flow, elucidates user authentication mechanisms, and identifies integration points with external systems, ensuring a holistic view for stakeholders.

User Guides:

User Guides are pivotal in facilitating a seamless interaction with the Binel platform. End User Documentation, tailored for both web and mobile applications, offers clear and concise instructions on platform navigation, donation procedures, and feature interactions. Troubleshooting guides are included to address common user issues, enhancing the overall user experience.

Admin Documentation:

Admin Documentation is designed for those overseeing the Binel system, providing insights into user management, donation monitoring, and other administrative tasks. It includes security guidelines and best practices, empowering administrators to safeguard the system and its users effectively.

Technical Specifications:

Technical Specifications cater to developers, offering in-depth information on both front-end and back-end components. API documentation details endpoints, request-response formats, and authentication mechanisms. Simultaneously, database schema documentation visually represents the underlying database structure and relationships between entities, serving as a crucial resource for development teams.

Testing Documentation:

Testing Documentation ensures the robustness of the Binel system. Test plans outline the scope, approach, and required resources for various testing phases, including unit testing, integration testing, and user acceptance testing. Comprehensive test cases, complete with expected outcomes, guarantee thorough coverage of system functionalities. Performance testing documentation details various scenarios, associated metrics, and resultant performance results, contributing to the system's reliability and efficiency.

Project Management Documentation:

Project Management Documentation includes a project charter providing an overview of objectives, scope, and stakeholders. The project schedule, with milestones, deadlines, and resource allocation, ensures effective project planning. A risk management plan identifies potential risks and outlines mitigation strategies, enhancing the project's resilience.

Legal and Compliance Documentation:

Legal and Compliance Documentation ensures adherence to relevant data protection laws, payment regulations, and other legal requirements. Terms of Service and Privacy Policy documents are provided for end users, establishing transparency and compliance.

Change Management Documentation:

Change Management Documentation includes change logs documenting system modifications, encompassing feature additions, bug fixes, and updates. Version control documentation outlines the branching strategy and release management process, ensuring systematic evolution and enhancement of the Binel system.

3.6.2Legal and Regulatory Requirements

User Agreements:

Terms of Service (ToS):

Binel acknowledges the importance of a robust Terms of Service agreement to establish the rules and guidelines for user engagement on the platform. This document outlines permissible behavior, rules of engagement, and limitations of liability, fostering a transparent and fair environment for all users.

End User License Agreement (EULA):

In cases where software is downloadable or requires installation, Binel recognizes the necessity of an End User License Agreement (EULA). This agreement delineates the terms under which users can use the software, ensuring clarity and adherence to legal requirements.

Privacy Policies:

Data Collection and Usage:

Binel's privacy policy is designed to be transparent, explicitly detailing the types of user data collected, the purposes of collection, and how this data will be utilized within the platform. This commitment to transparency empowers users to make informed decisions about their data.

Data Security Measures:

Binel prioritizes the security of user data, committing to robust security measures such as encryption, secure storage, and protective mechanisms against unauthorized access. This safeguards user information from potential threats and breaches.

Data Sharing and Third-Party Partnerships:

Binel is dedicated to transparent communication regarding the sharing of user data with third-party entities, clearly stating the purposes of such sharing. This ensures that users are aware of and consent to any external collaborations involving their data.

Regulatory Compliance:

KVKK (Kişisel Verilerin Korunması Kanunu):

Binel is fully compliant with Turkey's Personal Data Protection Law (KVKK), upholding the lawful processing and protection of personal data. This commitment aligns with the platform's dedication to privacy and data security.

Accessibility Compliance:

Accessibility Compliance is a pivotal aspect of Binel's commitment to creating an inclusive and user-friendly donation platform. The platform adheres to widely recognized accessibility standards, such as the Web Content Accessibility Guidelines (WCAG), to ensure that individuals with disabilities can seamlessly navigate, interact, and contribute to the Binel community.The implementation of WCAG guidelines involves various considerations, including providing alternative text for non-text content, ensuring keyboard accessibility, and creating a logical and intuitive navigation structure. Binel takes proactive measures to make its web and mobile applications perceivable, operable, and understandable for users with diverse abilities.This commitment to accessibility extends to features such as adaptable text sizes, sufficient color contrast, and the compatibility of assistive technologies. By following these standards, Binel aims to eliminate barriers and enhance the overall user experience for individuals with disabilities, fostering an environment where everyone can participate in the donation process without encountering undue challenges. Binel's dedication to Accessibility Compliance underscores its mission to make philanthropy accessible to all, regardless of individual abilities or disabilities.

Payment Regulations:

Binel complies with relevant payment regulations to ensure the secure and protected processing of financial transactions on the platform. This commitment is integral to fostering user trust in the donation process.

Data Retention Policies:

Defined Data Retention Policies:

Binel has clearly defined policies on how long user data will be retained, emphasizing transparency in data management. Users are informed of these policies, and procedures for data deletion upon user request or account closure are in place.

Cookie Policies:

Binel maintains a transparent cookie policy outlining the types of cookies used, their purposes, and mechanisms for user consent. This commitment to clear communication empowers users to manage their cookie preferences.

Children's Online Privacy Protection Act (COPPA) Compliance:

Binel ensures compliance with COPPA if the platform targets or knowingly collects information from children under 13. Parental consent is obtained before collecting any personal information from minors.

GDPR (General Data Protection Regulation) Compliance:

If catering to users in the European Union, Binel is committed to GDPR compliance, including user consent mechanisms and the right to be forgotten. This commitment aligns with Binel's dedication to global privacy standards.

Dispute Resolution Mechanisms:

Clear Dispute Resolution Mechanisms:

Binel provides clear mechanisms for dispute resolution, including contact information for dispute resolution entities and legal authorities. This commitment reinforces Binel's dedication to fair conflict resolution.

Updates and Amendments:

Notification of Updates:

Binel is committed to notifying users of any updates or amendments to legal agreements and policies, ensuring transparency and providing users with the opportunity to review and consent when required. This commitment fosters a relationship of trust between Binel and its users.

Ethical Considerations:

Incorporation of Ethical Considerations:

Binel incorporates ethical considerations into its operations, ensuring the responsible use of the platform in line with societal norms and values. This commitment reflects Binel's dedication to fostering a socially responsible donation platform.

4.Software Design Specification

4.1 Introduction

4.1.1 Purpose

The purpose of this Software Design Specification Document is to provide the details of the project titled “Binel”.The main purpose of the Binel application is to enable individuals to help those in need and fulfill their social responsibilities by providing an innovative platform that facilitates social assistance, and cooperation. This application allows its users to donate through accounts, institutions and organizations of their choice. Additionally, all institutions and organizations within Binel are divided into different categories with verification marks in various colors, which allows users to easily navigate the areas they want to help.

The distinguishing feature of Binel is that, in addition to referencing previous aid organizations such as the Ahbap Association, it aims to bring together those who want to give aid and those who want to receive help. In this context, the application prioritizes trust through the control mechanisms to be developed and provides assurance to users about directing their donations to those in real need. In this way, Binel aims to create a reliable cooperation ecosystem among users and strengthen solidarity within the society.

Among the complexities that the Binel project may face are the limited availability of sample systems in this field and the lack of sufficient users or resources. In order to overcome such problems, promoting the project and advertising on social media platforms with investor support is an important strategy. Additionally, support from institutions such as Cankaya University can play a critical role in increasing the user base.The Binel project covers many important issues that require expertise in computer science and its subfields. These topics include information security, database management, front-end and back-end services, API integration, payment methods and compliance with personal data protection laws. In this context, the aim of the Binel application is to successfully implement a complex social assistance platform and provide its users with a safe, transparent and interactive experience.

4.1.2 Scope

The scope of the BİNEL project draws the general framework of a platform designed to support social assistance and cooperation. In this context, the main goal of the project is to provide an interactive help platform for users, institutions and organizations. This platform will include a broad set of functional features to enable users to securely manage their donations to their preferred accounts, institutions and categories.By registering with Binel, users can create an account, manage their personal profiles and update their contact information. Profile management gives users the flexibility to edit their personal information, they can also personalize their identity on the platform by adding their profile picture. Binel offers an infrastructure that supports charitable individuals and institutions to create and manage charity campaigns. Users can create campaigns and manage their campaigns throughout their duration by specifying important information such as title, description, target donation amount and campaign duration. This allows users to start their own charity projects and contribute to outreach by spreading the word to the community. Users can participate in other fundraising campaigns on the platform, add support messages and interact with campaign owners. Additionally, Binel's categorization feature gives users the chance to filter by area of interest, making it easier for them to make specific and personal donation decisions. The platform stores user information securely and attaches great importance to the protection of personal data. This increases reliability on the platform by allowing users to interact in a safe environment. It allows users and campaign owners to track the performance of their fundraising campaigns by providing statistical information and reporting tools. This feature offers campaign owners the opportunity to manage and improve their campaigns more effectively. With these features, Binel stands out as a platform that supports the culture of social cooperation and aims to create a positive impact in society.

4.1.3 Overview of the software architecture

BINEL's software architecture includes basic modules such as user accounts management, donation transactions, database management, security measures, and user interface. User accounts management allows users to register, log in and manage their profiles on the platform. Donation processes manage the process by which users donate and create fundraisers. Database management ensures that data in the system is stored safely and effectively. Security measures ensure the protection of user information, secure connections and data integrity. The user interface enables users to use the platform in an interactive way. BİNEL's software architecture aims to provide users with a reliable, user-friendly and interactive help platform by working in harmony with these basic components.

4.2 Architectural Design

4.2.1 System Activity Diagram

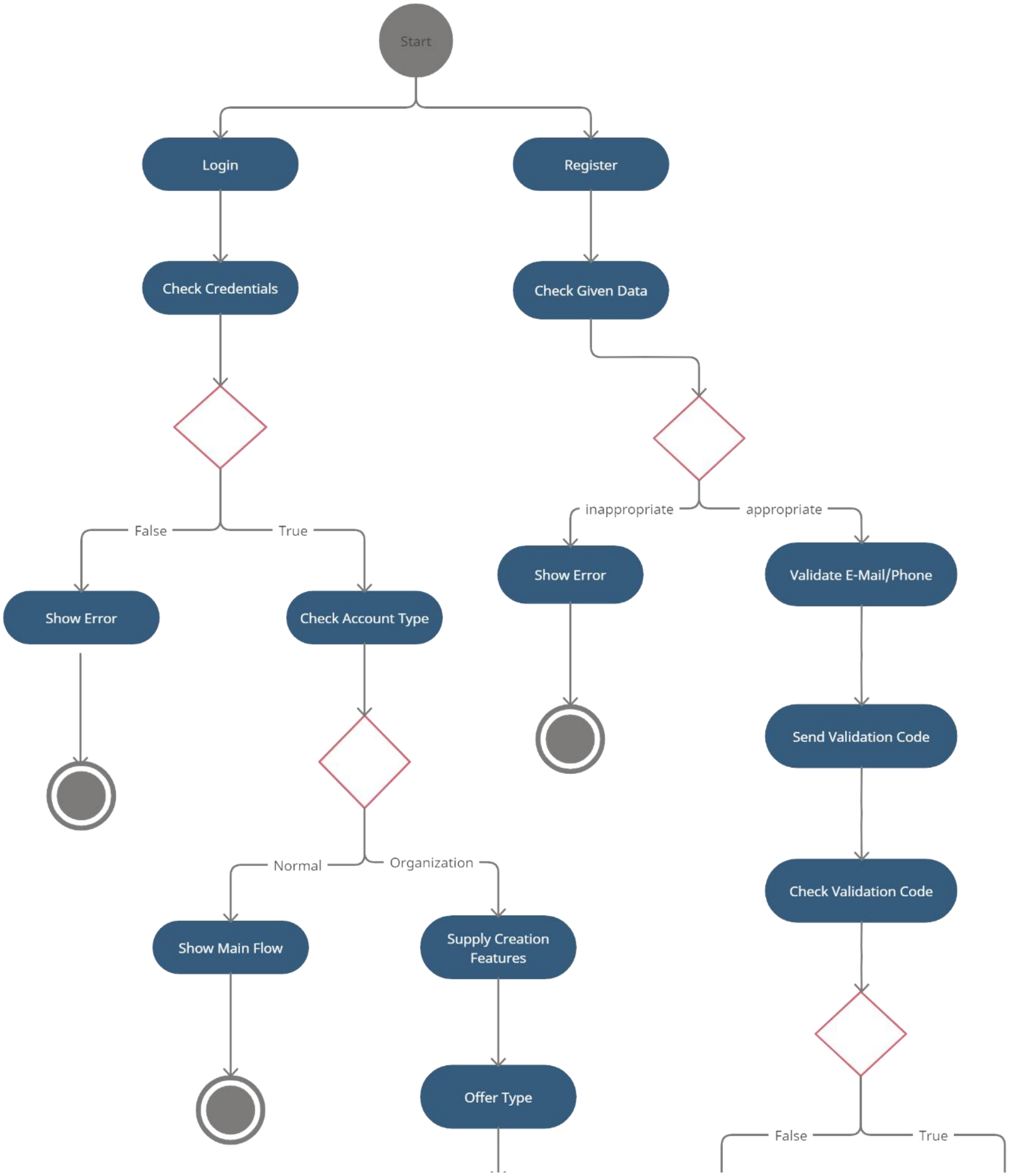


Figure 16. System Activity Diagram Part 1

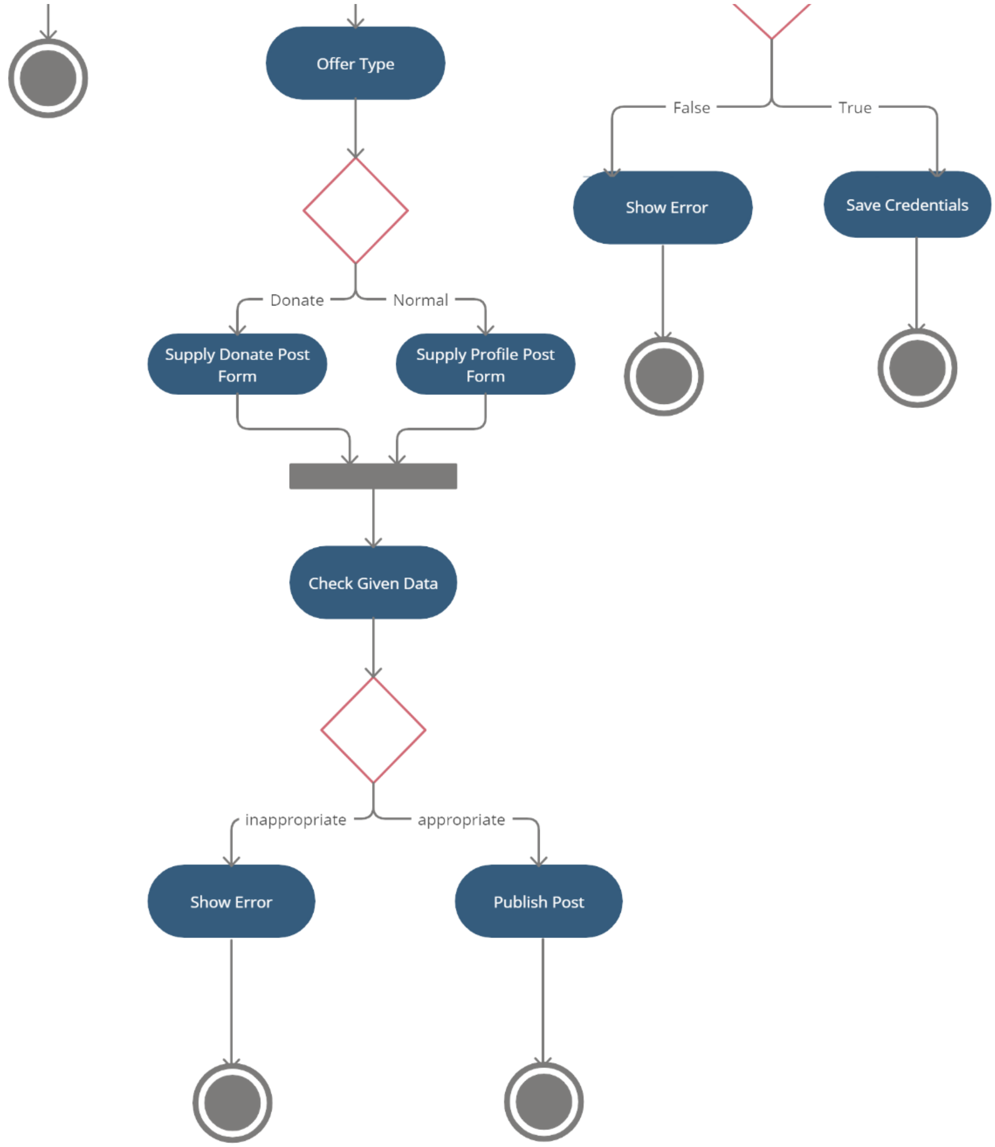


Figure 17. System Activity Diagram Part 2

4.2.2 UML Class Diagram

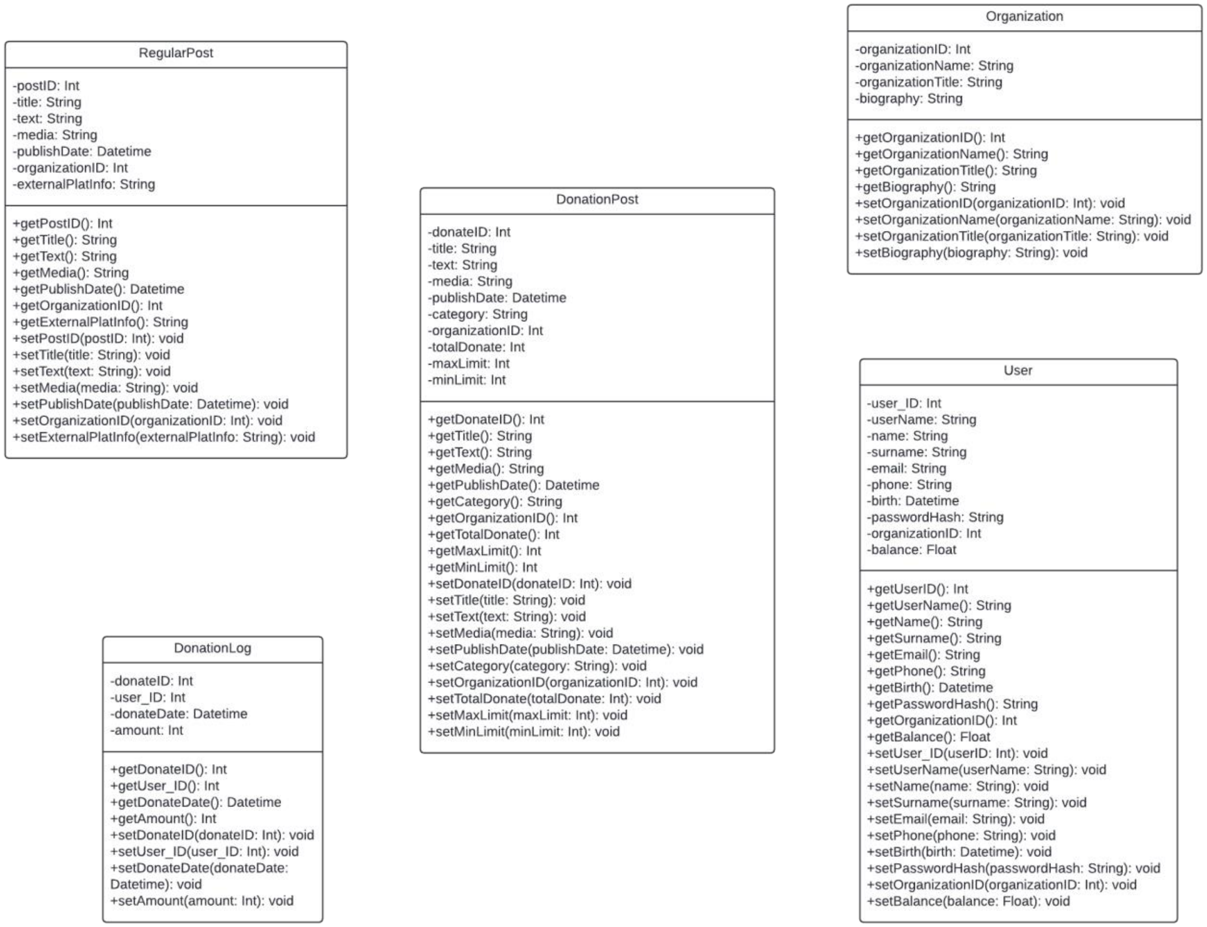

RegularPost
-postID: Int
-title: String
-text: String
-media: String
-publishDate: Datetime
-organizationID: Int
-externalPlatInfo: String
+getPostID(): Int
+getTitle(): String
+getText(): String
+getMedia(): String
+getPublishDate(): Datetime
+getOrganizationID(): Int
+getExternalPlatInfo(): String
+setPostID(postID: Int): void
+setTitle(title: String): void
+setText(text: String): void
+setMedia(media: String): void
+setPublishDate(publishDate: Datetime): void
+setOrganizationID(organizationID: Int): void
+setExternalPlatInfo(externalPlatInfo: String): void
DonationPost
-donateID: Int
-title: String
-text: String
-media: String
-publishDate: Datetime
-category: String
-organizationID: Int
-totalDonate: Int
-maxLimit: Int
-minLimit: Int
+getDonateID(): Int
+getTitle(): String
+getText(): String
+getMedia(): String
+getPublishDate(): Datetime
+getCategory(): String
+getOrganizationID(): Int
+getTotalDonate(): Int
+getMaxLimit(): Int
+getMinLimit(): Int
+setDonateID(donateID: Int): void
+setTitle(title: String): void
+setText(text: String): void
+setMedia(media: String): void
+setPublishDate(publishDate: Datetime): void
+setCategory(category: String): void
+setOrganizationID(organizationID: Int): void
+setTotalDonate(totalDonate: Int): void
+setMaxLimit(maxLimit: Int): void
+setMinLimit(minLimit: Int): void
Organization
-organizationID: Int
-organizationName: String
-organizationTitle: String
-biography: String
+getOrganizationID(): Int
+getOrganizationName(): String
+getOrganizationTitle(): String
+getBiography(): String
+setOrganizationID(organizationID: Int): void
+setOrganizationName(organizationName: String): void
+setOrganizationTitle(organizationTitle: String): void
+setBiography(biography: String): void
User
-user_ID: Int
-userName: String
-name: String
-surname: String
-email: String
-phone: String
-birth: Datetime
-passwordHash: String
-organizationID: Int
-balance: Float
+getUserID(): Int
+getUserName(): String
+getName(): String
+getSurname(): String
+getEmail(): String
+getPhone(): String
+getBirth(): Datetime
+getPasswordHash(): String
+getOrganizationID(): Int
+getBalance(): Float
+setUser_ID(userID: Int): void
+setUserName(userName: String): void
+setName(name: String): void
+setSurname(surname: String): void
+setEmail(email: String): void
+setPhone(phone: String): void
+setBirth(birth: Datetime): void
+setPasswordHash(passwordHash: String): void
+setOrganizationID(organizationID: Int): void
+setBalance(balance: Float): void
DonationLog
-donateID: Int
-user_ID: Int
-donateDate: Datetime
-amount: Int
+getDonateID(): Int
+getUser_ID(): Int
+getDonateDate(): Datetime
+getAmount(): Int
+setDonateID(donateID: Int): void
+setUser_ID(user_ID: Int): void
+setDonateDate(donateDate:
Datetime): void
+setAmount(amount: Int): void

Figure 18. UML Class Diagram

4.2.3 Database Diagram

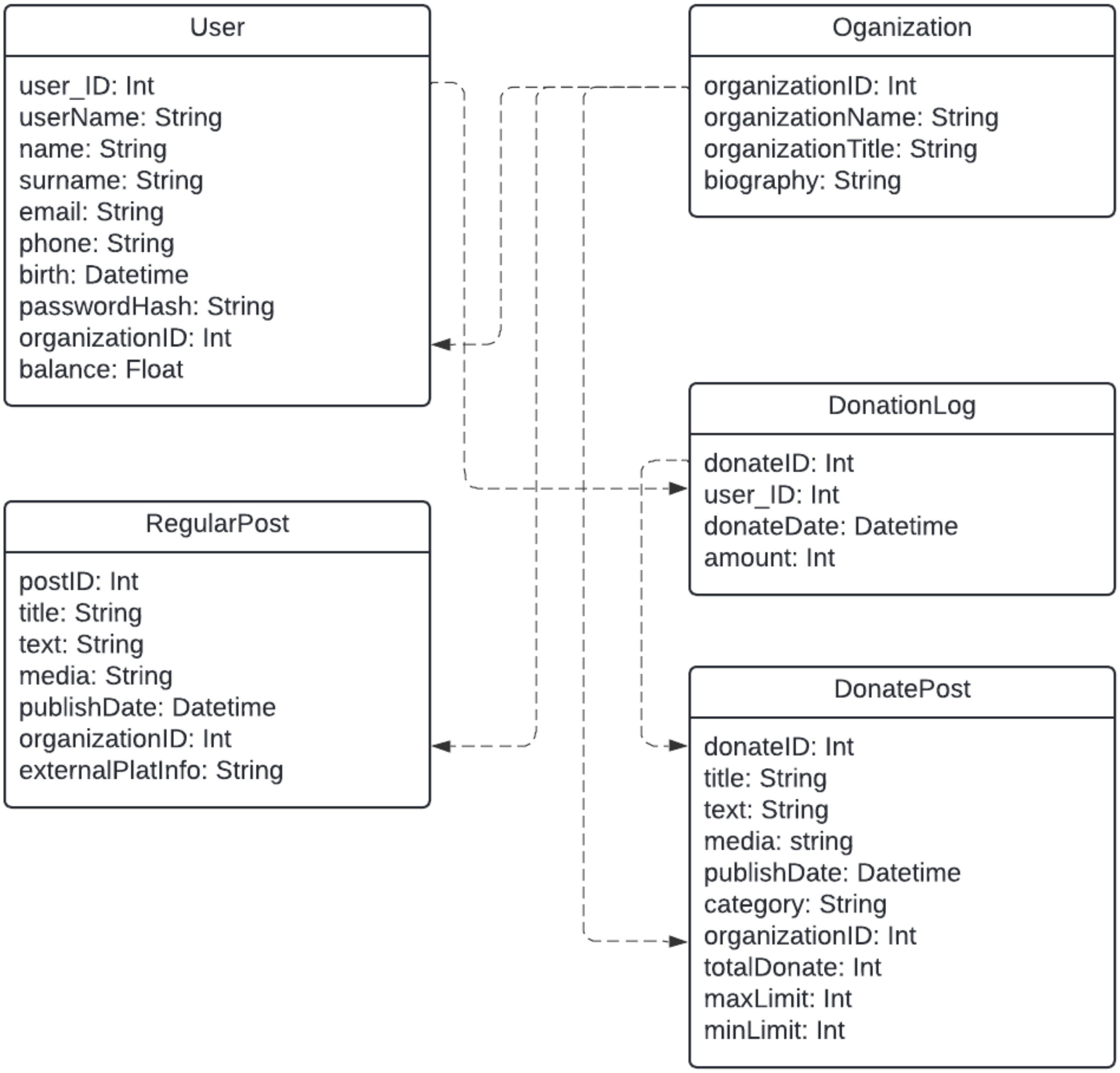


Figure 19. Database Diagram

4.3 User Interface Design

The user interface design for Binel is meticulously crafted to highlight its distinctive features and ensure a purposeful and engaging user experience. This section provides insight into the wireframes that visually represent key aspects of the interface and details user interactions within the platform.

4.3.1 Wireframes

Wireframes serve as visual blueprints, illustrating the essence of Binel's user interface:

4.3.1.1 Home Page Wireframe

The Home Page wireframe emphasizes the presence of organization posts, displaying updates, community initiatives, and projects. User engagement is facilitated through likes and the ability to explore organization profiles.

4.3.1.2 Organization Profile Wireframe

The Organization Profile wireframe showcases key details about the organization, including its mission, recent projects, and the impact of donations. Users can engage by liking posts and exploring donation histories.

4.3.1.3 Donation Interface Wireframe

The Donation Interface wireframe provides a user-friendly experience, allowing individuals to select donation amounts, choose a recipient organization, and include a personalized message during the donation process.

4.3.2 User Interaction

User interactions on Binel are carefully crafted to align with the platform's unique characteristics:

4.3.2.1 Home Page Interaction

Users can explore the Home Page featuring organization posts. Interaction is limited to liking posts and exploring organization profiles for a focused and purposeful experience.

4.3.2.2 Organization Profile Exploration

Users can delve into organization profiles, gaining insights into their activities and impact. Interaction includes liking posts and exploring donation histories for transparency and connection.

4.3.2.3 Donation Process with Messaging

During the donation process, users have the option to include a personalized message. This feature allows individuals to express their support, share thoughts, or convey specific intentions related to their donation.

4.3.2.4 User Profile Engagement

Users' profiles primarily showcase their engagement with organization posts and donations. While limited in functionality, the interface encourages users to participate in the community through likes and support.

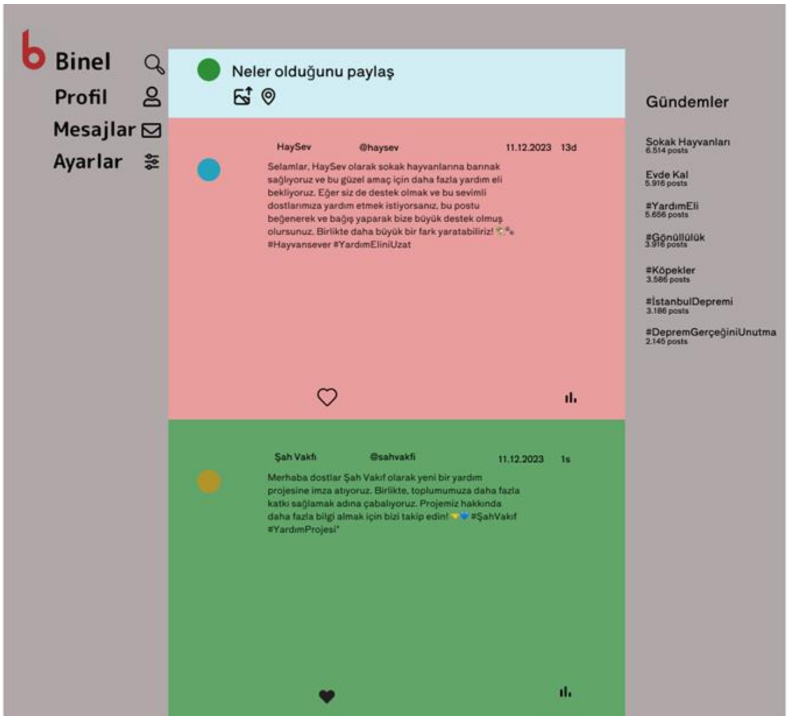
4.3.2.5 Applying Color Filters

Users have the capability to engage with color filters directly on the Home Page, enabling them to select specific colors to filter posts according to distinct aid categories. Each color serves as a visual indicator, representing a unique aid category and offering users an immediate visual cue about the nature of the assistance associated with each post. This empowering feature allows users to concentrate on the types of assistance that resonate with their interests, providing a customized and visually intuitive browsing experience.

These wireframes and user interaction details emphasize Binel's commitment to creating a purposeful platform, where organization profiles take center stage, and users can express their support through both financial contributions and meaningful messages.

4.3.3 Mockups or sketches of the user interface

4.3.3.1 Homepage



HaySev @haysev 11.12.2023 13d

Selamlar, HaySev olarak sokak hayvanlarına barınak sağlıyoruz ve bu güzel amaç için daha fazla yardım eli bekliyoruz. Eğer siz de destek olmak ve bu sevimli dostlarımıza yardım etmek istiyorsanız, bu postu beğenerek ve bağış yaparak bize büyük destek olmuş olursunuz. Birlikte daha büyük bir fark yaratabiliriz! #Hayvansever #YardımEliniUzat

Şah Vakfı @sahvakfi 11.12.2023 1s

Merhaba dostlar Şah Vakıf olarak yeni bir yardım projesine imza atıyoruz. Birlikte, toplumumuza daha fazla katkı sağlamak adına çabalıyoruz. Projemiz hakkında daha fazla bilgi almak için bizi takip edin! 💛💙 #ŞahVakıf #YardımProjesi"

Sokak Hayvanları
6.514 posts

Evde Kal
5.916 posts

#YardımEli
5.656 posts

#Gönüllülük
3.916 posts

#Köpekler
3.586 posts

#İstanbulDepremi
3.186 posts

#DepremGerçeğiniUnutma
2.145 posts

Figure 20. Homepage mockup screenshot

4.3.3.1 Register Page

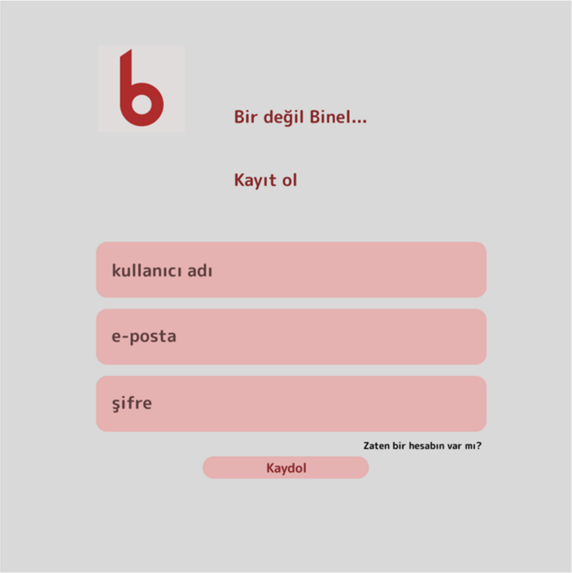
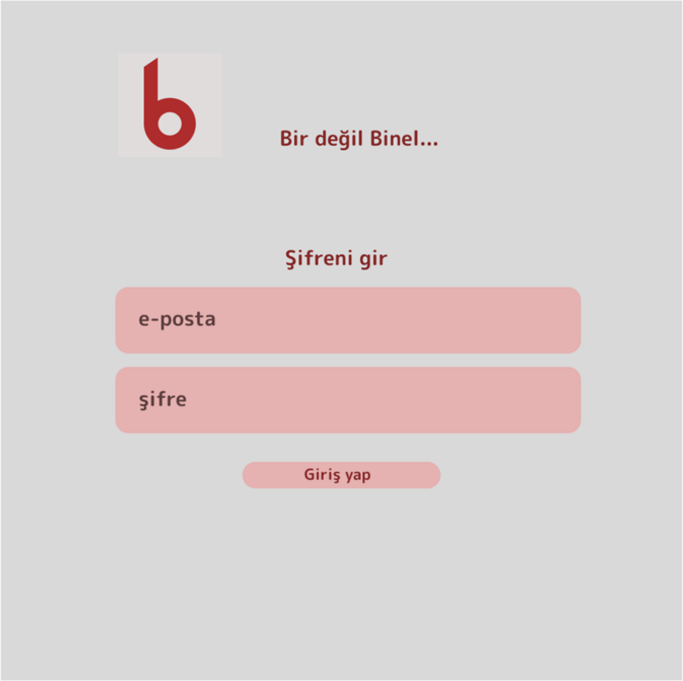


Figure 21. Register page mockup screenshot

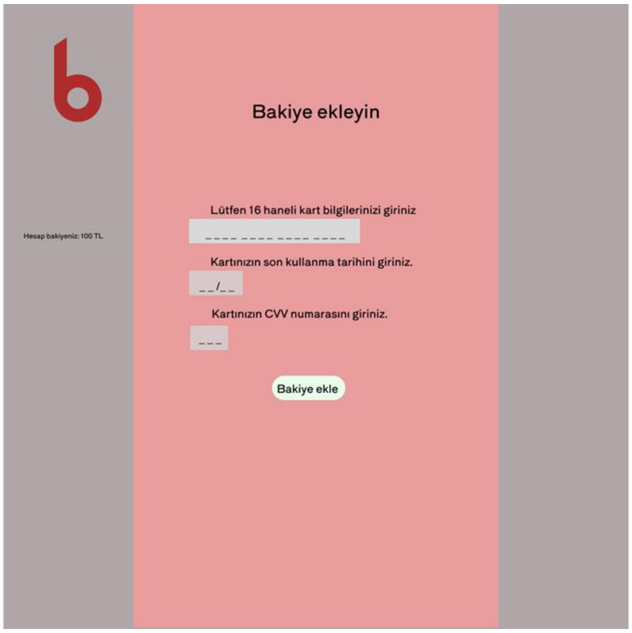
4.3.3.1 Sign Page



Bir değil Binel...

Figure 22. Sign page mockup screenshot

4.3.3.1 Payment Page



Bakiye ekleyin

Hesap bakiyeniz: 100 TL

Lütfen 16 haneli kart bilgilerinizi giriniz

Kartınızın son kullanma tarihini giriniz.

Kartınızın CVV numarasını giriniz.

Figure 23. Payment page mockup screenshot

4.4 System Integration

4.4.1 Integration Plan

4.4.1.1 Integration Overview

The "Binel" project encompasses three primary user types: Admin, Donor, and Organization. In addition to these, the project includes the integration of the "Post Module" and the "Latest Posts Page."

4.4.1.2 Integration Sequence Basic Module Integration

User Registration and Login: Integration of registration and login processes using email and phone numbers.

Two-Factor Authentication: Integration of a two-factor authentication module for secure user login.

Donor Module Integration:

Donation Process: Integration to enable donors to make contributions.

Security Code Verification: Integration of a module to verify security codes during login and registration.

Organization Module Integration:

Organization Profiles and Information: Integration to allow organizations to create and update their profiles.

Donation Requests: Integration to enable organizations to create donation requests.

Post Module Integration:

Organization Posts: Integration to allow organizations to share posts on the platform.

User Comments: Integration to enable users to comment on posts.

Latest Posts Page Integration:

User News Feed: Integration of a news feed where users can view the latest posts. User Interactions: Integration to allow users to interact with posts and comments.

4.4.1.4 Rollback Plan Backup

Regular system backups before each integration stage.

Rollback Procedure: Creation of a rollback procedure to revert the system to the last successful integration point in case of issues.

4.4.1.5 Integration Milestones

The Integration Milestones include Post Module Integration, Latest Posts Page Integration, and Full System Integration.

4.4.2 Testing Strategy

4.4.2.1 Testing Approach

The testing approach for the integrated "Binel" system will adopt a comprehensive strategy that covers various aspects of functionality, security, and user experience. The testing process will be iterative, focusing on both individual module testing and end-to-end system testing.

4.4.2.2 Testing Levels Unit Testing

Individual modules, including User Authentication, Donation Process, Organization Operations, Post Module, and Latest Posts Page, will undergo thorough unit testing. Mock data and isolated environments will be used to test each module's functionality independently. Integration Testing: Verify the seamless integration of modules by testing their interactions. Ensure data consistency and proper communication among modules. Conduct end-to-end tests for critical user journeys. System Testing: Evaluate the entire system's functionality and behavior under various scenarios. Perform regression testing to ensure that new features do not negatively impact existing functionality. Assess system performance, responsiveness, and scalability. User Acceptance Testing (UAT): Engage actual users to validate that the system meets their expectations. Collect feedback on usability, accessibility, and overall user satisfaction.

4.4.2.3 Testing Types Functional Testing

Validate that all features, including user registration, donation processes, organization operations, post creation, and the latest posts page, function as expected. Conduct positive and negative testing to ensure error handling is robust. Security Testing: Perform penetration testing to identify and address potential security vulnerabilities. Validate the effectiveness of two-factor authentication and security code verification. Usability Testing: Evaluate the user interface (UI) and user experience (UX) aspects of the platform. Ensure that navigation is intuitive, and users can easily perform required actions. Performance Testing: Assess the system's response time and overall performance under various load conditions. Identify and address bottlenecks to ensure optimal system performance.

4.4.2.4 Automation Unit and Integration Tests

Implement automated testing for unit and integration tests to streamline the testing process. Use testing frameworks to automate repetitive and critical test cases. Regression Testing: Employ automated regression testing to quickly validate existing functionality after each update.

4.4.2.5 Testing Environments Development Environment

Initial testing will occur in development environments to catch early-stage issues. Staging Environment: Intermediate testing will be conducted in a staging environment to simulate the production environment closely. Production Environment: Final testing will be performed in the production environment to validate the system's readiness for deployment.

4.4.2.6 Testing Documentation Test Cases

Develop detailed test cases for each testing level to ensure comprehensive coverage. Include positive and negative test scenarios. Test Results and Reports: Document test results and generate comprehensive reports for each testing phase. Include detailed information on issues found, their severity, and the corrective actions taken.

This testing strategy is designed to ensure the robustness, security, and user satisfaction of the integrated "Binel" system. It embraces a systematic approach to testing, incorporating various levels and types of testing to deliver a high-quality and reliable product.

4.5. Maintenance and Support

4.5.1 Maintenance Plan

4.5.1.1. Problem Detection and Error Correction

Regular monitoring and testing processes are planned to quickly detect and correct errors and problems that arise in the operation of BİNEL. By using automatic error tracking systems, problems encountered by users are quickly identified and necessary corrections are made.

4.5.1.2. Security Updates

Security is a critical factor for BİNEL. Therefore, regular security updates will be made to close vulnerabilities and protect against new threats. These updates will be implemented at both the software and infrastructure level.

4.5.1.3. Performance Improvements

In order to increase BİNEL's performance, performance evaluations will be made on the system regularly and improvements will be made when necessary. This aims to optimize user experience and speed up system responses.

4.5.1.4. Backup and Recovery

BİNEL's databases and important system components will be backed up at regular intervals and these backups will be stored in a secure environment. In this way, a fast recovery process is ensured in case of possible data loss.

4.5.1.5. User Feedback

Feedback provided by users will be evaluated regularly and necessary improvements will be made in the system based on this feedback. It is aimed to increase user satisfaction and constantly improve the user experience.

4.6.2 Support Procedures

4.6.2.1. User Support Center

BINEL will create a user support center to provide help and support to users. This center will serve as a contact point for users to report problems they encounter, receive solution suggestions, and submit questions regarding general platform usage.

4.6.2.2. Online Help Resources

BINEL will provide online help resources so that users can solve their own problems. These resources will include user guides, frequently asked questions (FAQ), video tutorials and knowledge bases on the platform.

4.6.2.3. Live Support and Communication Channels

In emergencies or more complex issues, users will have access to a support line or chat platform where they can communicate live with the BINEL support team. This aims to provide users with quick solutions and interactive support.

4.6.2.4. Feedback Gathering and Improvement

Feedback from users will be collected regularly and support procedures and the overall performance of the platform will be continuously improved based on this feedback. This feedback will be evaluated and necessary actions will be taken to increase user satisfaction and experience.

4.6.2.5. Training and Information Programs

Regular training and information programs will be organized so that users can use the platform more effectively. These programs aim to enable users to learn new features, understand effective usage practices, and make the most of the platform.

4.7. Data Management

Effective data management lies at the core of Binel's functionality, ensuring secure storage and seamless information processing. This section outlines the strategies employed for data storage and management.

4.8 Data Storage

Binel adopts a comprehensive approach to data storage, ensuring the accessibility and reliability of stored information. Key aspects include:

User Profiles and Engagement Data:

Stored in a relational database, facilitating efficient retrieval and management. Includes user profiles, engagement metrics, and donation histories.

Organization Information:

Maintained in a dedicated database, encompassing details about organizations, missions, and project impacts. Supports the creation of detailed organization profiles visible to users.

Campaign and Post Data:

Centralized storage for streamlined content sharing. Enables efficient retrieval for users to interact with posts, campaigns, and donation processes.

4.8.2 Data Security

Security measures implemented by Binel are designed to safeguard user and organizational data, ensuring a trustworthy platform:

Secure Data Transmission:

Utilizes the HTTPS protocol for secure data transmission, safeguarding user information during interactions.

Access Controls:

Implements strict access controls to restrict sensitive data access to authorized personnel only.

Data Encryption:

Incorporates robust encryption algorithms to secure stored data, providing an additional layer of protection against unauthorized access.

Regular Security Audits:

Conducts periodic security audits to proactively identify and address potential vulnerabilities.

User Authentication:

Implements robust user authentication mechanisms to verify and protect user identities.

Incident Response Plan:

Maintains a comprehensive incident response plan to promptly address and mitigate any security breaches.

Third-Party API Security:

Ensures the security of integrated third-party APIs through continuous monitoring.Through these meticulous data storage and security measures, Binel aims to instill confidence in users, fostering a secure and reliable environment for social cooperation and assistance.

4.9 Conclusion

Conclusion The Software Design Document for the "Binel" project outlines a comprehensive approach to creating a social assistance platform. The key points of the document include: Purpose and Scope: Binel aims to create an innovative platform that facilitates social assistance and cooperation. It brings together individuals, donors, and organizations, emphasizing trust and transparency in directing donations to those in real need. Software Architecture: Binel's architecture includes modules for user accounts, donation transactions, database management, security measures, and user interface. The design prioritizes reliability, user-friendliness, and interactivity. Architectural Design: The system architecture is described, detailing major components, their relationships, and visual representations through component and data flow diagrams. The database design is also outlined. Detailed Design: The document delves into the purpose, components, interfaces, and data structures of various modules, emphasizing their roles in achieving the platform's goals. User Interface Design: Wireframes and interaction details highlight the purposeful and engaging design of Binel's interface, with a focus on organization profiles, donation processes, and user engagement. Data Management: Binel's data management strategies ensure secure storage and seamless information processing. It covers data storage, security measures, and the integration of third-party APIs. System Integration: The integration plan outlines the sequence of integrating modules like user registration, donation processes, organization operations, post creation, and the latest posts page. A testing strategy ensures the robustness and reliability of the integrated system. Deployment: The document touches on hardware and software requirements, as well as the installation procedure for deploying the software. Maintenance and Support: A maintenance plan covers problem detection, security updates, performance improvements, backup, and recovery. Support procedures include a user support center, online help resources, live support channels, feedback gathering, and training programs.

5. Conclusion

The Binel Project aims to establish a sophisticated web and mobile application integration for a modern and effective social aid platform. Providing a user-friendly interface, it offers the opportunity for users to donate, create content, and engage within the community, reminiscent of a Twitter-like experienceThe front-end of Binel is shaped using advanced web technologies, including HTML, CSS, JavaScript, and Bootstrap. On the backend, robust frameworks such as Django, Laravel, and ASP.NET have been integrated to ensure the functionality of the platform. In mobile applications, technologies like Kotlin, Swift, Android Jetpack, and Cocoa Touch are employed to deliver a portable, secure, and interactive mobile experience. Binel aims to provide a consistent experience across Android, iOS, and web platforms through various multi-platform technologies like .NET MAUI, React, and Flutter. Segregated user classes for individuals, organizations, and community groups allow users to interact based on their unique needs, utilizing the platform's diverse features.By leveraging both relational databases (MSSQL, PostgreSQL) and NoSQL databases (MongoDB), Binel aims to meet every data need. This diversity in database technologies provides a flexible structure for data storage and management.

6. References

[1] Wikipedia Contributors, “HTML,” Wikipedia, Nov. 27, 2018. https://en.wikipedia.org/wiki/HTML

[2] “HTML Standard,” Whatwg.org, 2019. https://html.spec.whatwg.org/multipage/

[3] C. Lilley and F. Rivoal, Eds., “CSS Snapshot 2023,” www.w3.org, Feb. 14, 2023. https://www.w3.org/TR/css-2023/

[4] R. Ishida and A. Lanin, Eds., “Cascading Style Sheets, Level 1,” www.w3.org, Jul. 21, 2015. https://www.w3.org/TR/REC-CSS1/

[5] Mozilla, “CSS: Cascading Style Sheets,” MDN Web Docs, Jun. 26, 2019. https://developer.mozilla.org/en-US/docs/Web/CSS

[6] Z. Paruch, “What Is JavaScript & What Do You Use It For?,” Semrush Blog, Mar. 21, 2023. https://www.semrush.com/blog/javascript/

[7] M. Otto, “Bootstrap,” Getbootstrap.com, 2019. https://getbootstrap.com

[8] A. Booking, “What Is Bootstrap? an In-depth Guide of the Framework,” Amelia Booking WordPress Plugin, Jun. 06, 2019. https://wpamelia.com/what-is-bootstrap/

[9] “Top 10 Backend Technologies You Must Know [2023],” GeeksforGeeks, Jun. 23, 2023. https://www.geeksforgeeks.org/backend-technologies/

[10] Django Software Foundation, “The Web Framework for Perfectionists with Deadlines | Django,” www.djangoproject.com, 2005. https://www.djangoproject.com

[11] T. Otwell, “Laravel - the PHP Framework for Web Artisans,” Laravel.com, 2011. https://laravel.com

[12] Microsoft, “.NET | Free. Cross-platform. Open Source.,” Microsoft, 2002. https://dotnet.microsoft.com

[13] “Android Developers,” Android Developers, 2018. https://developer.android.com/

[14] Wikipedia Contributors, “Android Studio,” Wikipedia, Mar. 18, 2019. https://en.wikipedia.org/wiki/Android_Studio

[15] Kotlin, Kotlin, 2020. https://kotlinlang.org/

[16] “Android Jetpack,” Android Developers, 2019. https://developer.android.com/jetpack

[17] Apple Inc., “Apple Developer Documentation,” developer.apple.com. https://developer.apple.com/tutorials/app-dev-training

[18] Wikipedia Contributors, “Xcode,” Wikipedia, Nov. 09, 2019. https://en.wikipedia.org/wiki/Xcode

[19] JetBrains, “IntelliJ IDEA,” JetBrains, 2019. https://www.jetbrains.com/idea/

[20] Apple Inc., “Swift,” SWIFT, 2019. https://www.swift.com/

[21] Wikipedia Contributors, “Cocoa Touch,” Wikipedia, Nov. 21, 2021. https://en.wikipedia.org/wiki/Cocoa_Touch

[22] J. Walke, “Built-in React Hooks,” react.dev, Jun. 22, 2022. https://react.dev/reference/react

[23] React, “Introduction · React Native,” reactnative.dev, 2015. https://reactnative.dev/docs/getting-started

[24] Tutorialspoint, “Component-Based Architecture - Tutorialspoint,” www.tutorialspoint.com. https://www.tutorialspoint.com/software_architecture_design/component_based_architecture.htm

[25] GeeksforGeeks, “ReactJS Unidirectional Data Flow,” GeeksforGeeks, Apr. 26, 2019. https://www.geeksforgeeks.org/reactjs-unidirectional-data-flow/

[26] Flutter, “Flutter Documentation,” docs.flutter.dev, 2017. https://docs.flutter.dev/

[27] Dart, L. Bak, and K. Lund, “Dart overview,” dart.dev, 2011. https://dart.dev/overview

[28] Multi-OS Engine Community, “Introduction — Multi-OS Engine Community Documentation,” moe.noisyfox.io. https://moe.noisyfox.io/doc/multi-os-engine/2_Introduction/Introduction.html

[29] D. Britch and Microsoft, “.NET Multi-platform App UI Documentation - .NET MAUI,” learn.microsoft.com. https://learn.microsoft.com/en-us/dotnet/maui/?view=net-maui-8.0

[30] Microsoft, “Xamarin | Open-source Mobile App Platform for .NET,” Microsoft, 2013. https://dotnet.microsoft.com/en-us/apps/xamarin

[31] B. Wagner and Microsoft, “C#,” learn.microsoft.com, 2002. https://learn.microsoft.com/en-us/dotnet/csharp/language-reference/

[32] Amazon Web Services, “Relational vs Nonrelational Databases - Difference Between Types of Databases - AWS,” Amazon Web Services, Inc. https://aws.amazon.com/compare/the-difference-between-relational-and-non-relational-databases/

[33] Amazon Web Services, “What is NoSQL? | Nonrelational Databases, Flexible Schema Data Models | AWS,” Amazon Web Services, Inc., 2019. https://aws.amazon.com/nosql/

[34] DB-Engines, “Information on 480 Database Management Systems,” db-engines.com. https://db-engines.com/en/systems

[35] Oracle, “What Is a Relational database?,” Oracle.com, 2023. https://www.oracle.com/database/what-is-a-relational-database/

[36] A. Digital, “Microsoft SQL Server Nedir?, Ne İçinKullanılır?,” GTech, Apr. 11, 2022. https://www.gtech.com.tr/microsoft-sql-server-nedir-ne-icin-kullanilir

[37] Vargonen, “MsSQLve MySQL Nedir?,” Vargonen Blog, Mar. 17, 2020. https://www.vargonen.com/blog/mssql-ve-mysql-nedir/

[38] G. YAVAŞ, “Transact-SQL (T-SQL) Nedir?,” gokhanyavas, Jul. 27, 2017. https://medium.com/gokhanyavas/transact-sql-t-sql-nedir-7ca680854efd (accessed Nov. 27, 2023).

[39] AppMaster, “What Is PostgreSQL? | AppMaster,” appmaster.io, 2022. https://appmaster.io/blog/what-is-postgresql

[40] Patika, “İlişkiselveNoSqlVeritabanları Lesson,” Patika Dev, Jul. 06, 2021. https://academy.patika.dev/courses/net-core/1-iliskisel-nosql-veritabanlari

[41] Ahbap, “Ahbap,” 2017. https://ahbap.org

[42] HelpKarma, “The Most Transparent Fundraising Platform | HelpKarma,” helpkarma.com, 2017. https://helpkarma.com

[43] GoFundMe, “GoFundMe: #1 in Free Fundraising & Crowdfunding Online,” Gofundme.com, 2010. https://www.gofundme.com