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| **CS102 – Spring 2024/2025**   |  |  |  |  | | --- | --- | --- | --- | | **Instructor:** | Uğur Güdükbay | **Section No:** | **3** | | **Assistant:** | Ebrar Bozkurt | |  |  |  |  | |

**~ Bilkom ~  
Group0 (3H)**

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| **Requirements Report V2 Due: 30 March 2025** |

1. Introduction

University life is not solely defined by academic achievement; it is also a critical period for personal growth, social development, and mental well-being. As students transition to college, they encounter opportunities to form meaningful relationships, engage in extracurricular activities, and develop skills that extend far beyond the classroom. Research indicates that active participation in campus events and social activities significantly enhances students’ sense of belonging and overall mental health (Inside Higher Ed, 2023). Moreover, Lee et al. (2022) highlight that social isolation and loneliness are strongly linked to depressive symptoms and heightened academic stress among college students.

Despite the available opportunities, many students still struggle to navigate the complexities of campus life, leading to feelings of disconnection and isolation. The traditional ways of social engagement often fall short when addressing the needs of a diverse student body, particularly in an era where rapid social changes can promote feelings of alienation or loneliness. These challenges highlight the urgent need for innovative solutions to facilitate more effective campus social interactions.

Considering all of this, developing a dedicated platform designed to help students connect and socialize more effectively represents a timely and essential intervention. Such a platform could provide structured support for building social networks, enhancing the overall campus experience, and fostering a healthier, more vibrant, and active community.

Therefore, as Group0, we’d like to introduce Bilkom, a user-friendly platform designed to enhance the social and academic experience of Bilkent students. Bilkom is a community-driven platform intended to improve the social and academic experience of Bilkent University students. We want a protected environment and community exclusively tailored for Bilkent University students. Moreover, by providing a user-friendly interface, we aim to prevent users from wasting time while using the application. Bilkom connects students with like-minded peers for activities, hobbies, and events, fostering a vibrant campus life.

The platform also supports student clubs in promoting their events, encourages socialization to reduce academic stress and combat loneliness, and ensures swift emergency communication within the community. Additionally, as developers, we plan to gradually add features that facilitate carpooling and travel coordination to Bilkom. Thus reinforce a culture of shared transportation among students. With its diverse features, Bilkom aims to create a more connected, engaged, and supportive campus environment.

2. Details

**2.1 Activity Matching and Shared Interests**

Bilkom streamlines finding partners for activities ranging from sports and games to collaborative projects. By allowing users to post activities with a participant quota, the platform provides a space for participants to connect with the events organizor and each other, also sending notifications when a new participant joins. This innovative approach not only simplifies the organization process but also fosters a more connected and engaging campus community.

### **2.2 Enriching Campus Life Through Activities and Student Clubs**

We also recognize the importance of school clubs and participation in them. Therefore, by providing a platform where student clubs can advertise their organizations with quota and time, we plan to replace ineffective methods of announcements, such as hanging posters or announcing through social media and WhatsApp communities. Bilkom would allow clubs to announce their events to larger audiences while allowing more students to be up-to-date and knowledgeable about student clubs and communities also their events, eventually leading to a more active and lively campus life.

### **2.3 Combating Depression and Managing Academic Stress Through Socialization**

Just like other university students, students in Bilkent are also known to frequently experience stress and depression due to demanding academic schedules and life transitions. Research indicates that strong connections with one’s local community play a crucial role in improving psychological well-being and stress management (Cohen & Wills, 1985). Unlike general social media platforms, Bilkom is designed specifically for Bilkent University students, enabling direct interactions within their immediate community. This targeted approach enhances students' sense of belonging, both toward school and community.

Studies also suggest that social support networks improve resilience and coping mechanisms, making individuals more equipped to handle academic pressure (Taylor, 2011). By strengthening local connections, what we want to achieve through Bilkom is not only facilitating socialization but also helping students manage stress more effectively. Therefore, our community-driven focus sets it apart from broader platforms, offering a unique space for students to support each other both socially and academically.

**2.4 Report System**

Bilkom features a reporting system, aiming to prevent any harrasment, abusement or unwanted behaviour. Events or people who are reported will be inspected and officials of Bilkent will be informed about such behaviours. Ultimately securing a safe and healthy environment.

**2.5 Similar Applications and Tools**

***2.5.1 Application Logic***

While creating Bilkom, the logic behind activity organization was a result of our team merging the posting system of Reddit and Bilkent students’ need for community activities.

***2.5.2 User Interface***

For the user interface arrangement, this application’s biggest inspirations were Reddit and X, these apps’ slightly detailed and user friendly user interfaces were a big example while designing Bilkom’s UI.

### **2.6 Software Features**

***2.6.1 User Management***

Since this app will only be available to Bilkent Universty students to be able to register to Bilkom only using their Bilkent emails that end with “bilkent.edu.tr”. This is crucial, considering the main objective of this app is to create a community for Bilkent students. To prevent security breaches from outsiders to register students would have to verify their identities as students of Bilkent using their school mail.

Students would also add/delete their interests from their profiles, which would evaluate Bilkom to pop up events or activities related to their interests. Through this feature, students can easily access activities they might be interested in as well as emergent advertisements posted.

***2.6.2 Activity and Event Management***

Users would be able to create activities with a message as well as the name of the event, event quota, and which interest it belongs to with proper tags. While creating an event, the users would tag the event with interest groups such as board games, sports, movies, etc. Through this, students will be able to view and look for activities that suit their own interests. They could filter active/available events by interest tags, quota, and event time.

Students would be able to view the activities and the filled quota as well as the event's message, name and tags. They could apply to the events, and a notification would be sent to the event's creator. When the a new participant joins, all the users who have applied for the activity will be alerted. Another separate notification will be sent at the time of the event.

Student clubs and communities could also announce their events on Bilkom, enabling them to reach similar-minded individuals more efficiently and swiftly than traditional or current methods of poster hangings, announcing on social media or in their whatsapp groups.

### **2.7 Software Requirements**

### ***2.7.1 Backend System – The Heart of Bilkom***

### This is where all the important operations happen like storing data, handling user actions, and ensuring everything runs smoothly.

* What We Will Use:
  + Java with Spring Boot: Using Java and Spring boot for the backbone, we plan to ensure a safe and fast background for our system to run on.
  + MySQL/PostgreSQL: We will use these programming languaegs to securely store user information, events data, and messages.
  + Hibernate (JPA): This tool will act as an assistant to help us easily move data between our app and our database.
  + JWT-based Authentication: Using JWT, we will send verification mails to students’ bilkent mail adresses to ensure a closed environment.
  + Cloud Hosting (AWS, DigitalOcean, or Heroku): We will use cloud hosting to run our backend online, ensuring it’s available and can grow with our user base.

### ***2.7.2 Frontend System – The Face of Bilkom***

### Our frontend will be designed to be simple, clean for easy and smooth usage.

* What We Will Use:
  + HTML, CSS, and JavaScript: We will build our frontend using these languages to provide our users a nice and easy-to-use interface.
  + Bootstrap or Tailwind CSS: We will use these CSS templates to design a modern and useful interface.
  + Optional Future Upgrade (React.js): In need of a more dynamic experience later on, we can use React.js to make our site even more interactive.

### ***2.7.3 Security & Data Protection – Keeping Everything Safe***

### This ensures that all user information is protected and that only authorized users have access to the system.

* What We Will Use:
  + JWT-based Authentication: This secure system will ensure every user is verified before accessing the app.
  + Data Encryption (HTTPS and AES): Data will be locked down during transmission (using HTTPS) and in storage, so personal details remain private.
  + Role-Based Access Control: Different users (like students, club members, and administrators) have specific permissions, keeping the system more secure and organized.

### ***2.7.4 Performance & Scalability – Ready for Growth***

### Ensures the app runs smoothly even when many students are using it at the same time.

* What We Will Use:
  + Caching Mechanisms (Redis or Ehcache): These will help speed up the app by temporarily storing frequently used data.
  + Efficient Database Indexing: This will ensure location searches and other queries run quickly.

Automated Cloud Backups: Regular backups keep all the data safe, so nothing is lost if something goes wrong.

3. Possible Extensions

### **3.1 Emergency Alerts and Rapid Community Response**

### Emergencies such as fire or possible collapse, as well as health issues that require immediate attention, would also be included on Bilkom. When such a problem arises, suitable community members will be alerted. For example, in need of a blood transfusion, when a fire breaks out or in similar situations, the students will be made aware by these situations via instant notifications. Unlike in BAIS mails —which students tend to ignore— this platform makes it easier to see emergencies, elevates community support, and provides immediate response.

### **3.2 Weather Report and Livestream News Feed**

As Group0 our wish is to develop an app which is suitable for daily usage. Since the platform will be visited frequently we believe that it would be beneficial to provide a news feed and a weather forecast report in the home page. Thanks to these features, students will be able to follow events and activities without being disconnected from campus life by being informed about the latest developments. With the help of real time weather forecasts in Bilkent which is visible on the home page, active users will be provided an interface to plan their schedules effectively.

Through directly posting the recent news from Bilkent originated news sites <https://bilkentnews.bilkent.edu.tr/> and <https://gazetebilkent.com/> we will remain loyal to our only Bilkent Students principle. We aim to make these news more visible to students, improving the oldschool news site style of these websites.

### **3.3 Carpooling, Travel Coordination, and Campus Hitchhiking Culture**

Bilkent University, with its expansive campus, presents unique transportation challenges compared to other universities in Ankara. Unlike campuses with more established ride-sharing cultures, Bilkent students often struggle to find efficient and affordable ways to travel together. Bilkom addresses this gap by providing a platform for students to coordinate carpooling, whether for daily commutes, weekend trips, or long-distance travel during breaks. What sets Bilkom apart from other similar applications is its strong focus and reliance only on the Bilkent community itself.

Unlike generic ride-sharing apps, Bilkom is tailored specifically for Bilkent students, allowing a safe and trustworthy environment for arranging shared rides. Enabling a report system to further ensure safety. By fostering a culture of carpooling and hitchhiking within the campus, Bilkom not only helps reduce travel costs and environmental impact but also strengthens the sense of community. These shared journeys provide an opportunity for students to meet new people, exchange ideas, and build connections —turning every ride into a chance for engagement beyond the classroom.

**3.4 Similar Applications That Have Bilkom’s Possible Extension Features**

***3.4.1 Emergency Alerts, Live Weather Report and Bilkent News***

Integrating emergency alerts, weather report and Bilkent University News are ideas inspired by simple widgets many people use in their phones. Many people use widgets to see the weather condition, news and emergency alerts on their daily used electronics and while creating Bilkom we thought it would be a user friendly attempt to add these features to our app.

***3.4.2 Carpooling For Bilkenters***

Martı TAG was the inspiration behind the idea of carpooling opportunity just for Bilkenters. We merged the simple and yet very useful logic of Martı TAG with the need of carpooling culture in campus of Bilkent.

### **3.5 Software Features For Possible Extensions**

***3.5.1 Emergency Situations***

Bilkom provides a real-time emergency alert system to ensure the safety and well-being of Bilkent University students. In the event of fires, accidents, or other urgent situations, students near the affected area receive instant notifications to take necessary precautions.

Additionally, students are required to enter their blood type during registration, which allows for a targeted blood donation alert system. In case of a blood transfusion request, students with the matching blood type will be notified with an emergency alert, ensuring a faster and more effective response in critical medical situations. By prioritizing community-driven support, Bilkom strengthens student safety and fosters a culture of helpfulness and responsibility on campus.

***3.5.2 Weather and Bilkent News Feed On Home Page***

Bilkom’s homepage provides real-time weather updates and Bilkent University news to keep students informed. The weather feature displays the current temperature and conditions in Bilkent, helping students plan their day. The news section ensures students stay updated on university events and announcements, either by fetching news from an RSS feed, using web scraping, or embedding the Bilkent News website. These features make Bilkom a convenient source for both daily planning and campus updates.

***3.5.3 Carpooling Service***

Bilkom provides a secure and efficient carpooling system tailored for Bilkent University students. Users can offer or request rides for daily commutes, weekend trips, or long-distance travel during breaks. Only verified Bilkent email users can participate in carpooling to ensure safety and reliability. The platform includes live GPS tracking, allowing users to share their real-time location with their ride partners for better coordination.

Additionally, Bilkom features an instant messaging system that enables carpoolers to communicate directly within the app. To maintain a safe and respectful environment, the system includes a report button allowing users to report harassment or misconduct during a ride. Administrators will review reported incidents, ensuring a secure and comfortable carpooling experience for all students.

### **3.6 Software Requirements For Possible Extensions**

### ***3.6.1 Emergency Alerts & Blood Donation System – Responding Quickly When Needed***

### In case of an emergency like a fire or accident, this feature alerts nearby students immediately. It also helps in medical emergencies by sending targeted blood donation alerts.

* What We Will Use:
  + WebSockets for Instant Alerts: This technology will allow us to send notifications right away, ensuring students are informed as soon as possible.
  + Backend API for Medical Requests: The system will record any urgent help requests so they can be quickly addressed.
  + Targeted Blood Donation Alerts: During registration, students provide their blood type, and the system uses this information to send emergency alerts to matching donors, speeding up the process in critical situations.

### ***3.6.2 Weather & Bilkent News – Keeping Everyone Informed***

### The homepage of Bilkom displays real-time weather updates and the latest news from Bilkent University, so students won’t have to visit multiple sites.

* What We Will Use:
  + OpenWeatherMap API: This API tool will fetch current weather information (like temperature and conditions) so that students will know what to expect outside.
  + RSS Feed Parsing or JSoup for News [Optional]: If Bilkent’s news website offers an RSS feed, we’ll use that to automatically pull the latest headlines. If not, we’ll use JSoup to extract news from the site. As a fallback, we might even embed the news page directly.

### ***3.6.3 Carpooling & GPS Features – Making Rides Safe and Convenient***

* What We Will Use:
  + Google Maps API or OpenStreetMap API: We plan to use these API services to get their map and location data so that users can see where their matches are in real time.
  + Geolocation API: This browser tool finds out the current location of a user, which is then shown on the map.
  + Real-Time Messaging as an Optional Update (WebSockets or Firebase): We may use these technologies to provide a real-time messaging environment for users.
  + Harassment Report Feature: A simple “Report” button will let users flag any issues immediately, ensuring that experiences with Bilkom is safe for everyone.

4. Conclusion

As Group0 we realized the organizational difficulty caused by the lack of communication at Bilkent University and we embarked on this path to solve it. Our goal is to integrate innovative solutions into the application, ensuring its suitability for daily use. While achieving this goal, we have adopted the principle of ensuring the safety of Bilkent students. Bilkom will facilitate in activity matching, promoting student clubs, and addressing critical issues like academic stress, social isolation. Bilkom aims to foster a vibrant and supportive, and most importantly an effective and trustworthy campus environment. When the development of Bilkom is completed students will be provided a safe environment for to coalesce.

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