



KOÇ
UNIVERSITY



COMP 491 Project: Ulgen – Mid Demo

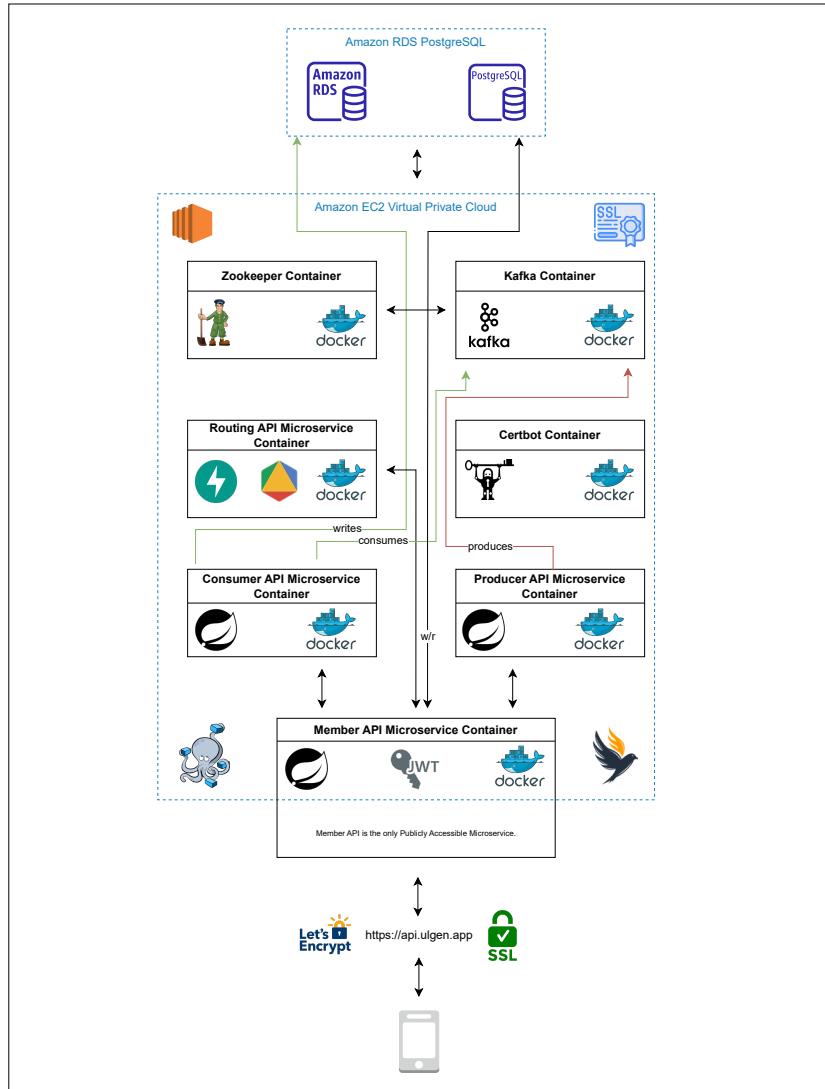


"Ulgen": Residence Activity Monitor and OR Solutions to
Disasters

Kaan Turkmen, Can Usluel
Halil Doruk Yildirim, Bumin Aybars Inci



What is Completed? - Kaan





Load Testing



```
kaan@turkmen load_tests.ulgen % k6 run member_routing_api_load_test.js
  _/\_ [VZ] .io
execution: local
script: member_routing_api_load_test.js
output: -
scenarios: (100.00%)
  * default: Up to 200 looping VUs for 7m0s over 4 stages (gracefulRampDown: 30s, gracefulStop: 30s)

  █ API Test
    ✓ status is 200
    ✓ response body is not empty

  checks...
    data_received...: 100.00% < 11454   × 0
    data_received...: 7.2 MB 17 kB/s
    duration...: 7.00m 0.0s
    http_req_blocked...: avg=10.33ms min=3us med=5us max=613.07ms p(90)=3us p(95)=14us
    http_req_connecting...: avg=0.94ms min=8s med=9s max=262.04ms p(90)=3s p(95)=0s
    http_req_duration...: avg=211.28ms min=10.28ms med=10.28ms max=102.23s p(90)=14.42s p(95)=17.22s
    ( expected_response:true )...: avg=7s min=211.28ms med=5.0s max=5.03s p(90)=14.42s p(95)=17.23s
    http_req_failed...: 0.00% 0 / 5727
    http_req_receiving...: avg=399.74us min=3us med=9us max=913.37ms p(90)=79us p(95)=1.17ms
    http_req_sending...: avg=399.01us min=15us med=15us max=159.12ms p(90)=79us p(95)=0s
    http_req_tls_handshaking...: avg=8.37ms min=8s med=8s max=196.46ms p(90)=8s p(95)=0s
    http_req_waiting...: avg=76 min=213.72ms med=6.9s max=35.92s p(90)=14.42s p(95)=17.22s
    iteration_duration...: avg=8.01s min=1.21s med=6.91s max=36.93s p(90)=15.43s p(95)=18.23s
iterations...: 5727 13.592/3.9s
vus...: 1
vus_max...: 200 min=1 max=200
running (7m01.2s), 000/200 VUs, 5017 complete and 0 interrupted iterations
default: [=====] 000/200 VUs 7m0s
ERR0[0422] thresholds on metrics 'http_req_duration' have been breached
kaan@turkmen load_tests.ulgen %
```

```
kaan@turkmen load_tests.ulgen % k6 run --out json=routing_api_load_test_result.json routing_api_load_test.js
  _/\_ [VZ] .io
execution: local
script: routing_api_load_test.js
output: json (routing_api_load_test_result.json)
scenarios: (100.00%)
  * default: Up to 200 looping VUs for 7m0s over 4 stages (gracefulRampDown: 30s, gracefulStop: 30s)

  █ API Test
    ✓ status is 200
    ✓ response body is not empty

  checks...
    data_received...: 100.00% < 10036   × 0
    data_received...: 4.0 MB 9.5 kB/s
    duration...: 7.00m 0.0s
    group_duration...: avg=145.17ms min=32.6ms med=141.63ms max=344.14ms p(90)=146.76ms p(95)=147.74ms
    http_req_blocked...: avg=5.44ms min=3us med=7us max=208.50ms p(90)=7us p(95)=8us
    http_req_connecting...: avg=5.62ms min=8s med=8s max=388.90ms p(90)=8s p(95)=0s
    http_req_duration...: avg=8.15s min=204.67ms med=9.01s max=48.69s p(90)=14.48 p(95)=14.59s
    ( expected_response:true )...: avg=8.15s min=204.67ms med=9.01s max=48.69s p(90)=14.48 p(95)=14.59s
    http_req_failed...: 0.00% 0 / 5018
    http_req_receiving...: avg=180.84us min=27us med=80us max=2.57ms p(90)=109us p(95)=1.12ms
    http_req_sending...: avg=43.66us min=18us med=45us max=943us p(90)=53us p(95)=6.14us
    http_req_tls_handshaking...: avg=8s min=8s med=8s max=8s p(90)=8s p(95)=0s
    http_req_waiting...: avg=145.27us min=9us med=145.27us max=11.12ms p(90)=158us p(95)=1.81ms
    http_req_blocked...: avg=32.7us min=9us med=30us max=1.57ms p(90)=6us p(95)=4us
    http_req_tls_handshaking...: avg=8s min=8s med=8s max=8s p(90)=8s p(95)=0s
    http_req_waiting...: avg=141.05ms min=132.18ms med=141.24ms max=389.77ms p(90)=146.22ms p(95)=147.16ms
    iteration_duration...: avg=1.24s min=1.19s med=1.14s max=1.34s p(90)=1.14s p(95)=1.14s
iterations...: 5017 11.933246/s
vus...: 1
vus_max...: 200 min=1 max=200
running (7m00.4s), 000/200 VUs, 5017 complete and 2 interrupted iterations
default: [=====] 000/200 VUs 7m0s
ERR0[0421] thresholds on metrics 'http_req_duration' have been breached
kaan@turkmen load_tests.ulgen %
```

```
kaan@turkmen load_tests.ulgen % k6 run --out json=producer_api.load_test_result.json producer_api_load_test.js
  _/\_ [VZ] .io
execution: local
script: producer_api.load_test.js
output: json (producer_api.load_test_result.json)
scenarios: (100.00%)
  * default: Up to 100 looping VUs for 7m0s over 6 stages (gracefulRampDown: 30s, gracefulStop: 30s)

  █ API Test
    ✓ status is 200
    ✓ response body is not empty

  checks...
    data_received...: 100.00% < 36294   × 0
    data_received...: 3.8 MB 9.1 kB/s
    duration...: 7.00m 0.0s
    group_duration...: avg=145.17ms min=32.6ms med=141.63ms max=344.14ms p(90)=146.76ms p(95)=147.74ms
    http_req_blocked...: avg=1.8ns min=1us med=5us max=208.50ms p(90)=7us p(95)=8us
    http_req_connecting...: avg=141.21ms min=132.45ms med=141.42ms max=146.39ms p(90)=146.39ms p(95)=147.33ms
    http_req_duration...: avg=8.15s min=204.67ms med=9.01s max=48.69s p(90)=14.48 p(95)=14.59s
    ( expected_response:true )...: avg=8.15s min=204.67ms med=9.01s max=48.69s p(90)=14.48 p(95)=14.59s
    http_req_failed...: 0.00% 0 / 18147
    http_req_receiving...: avg=180.84us min=27us med=80us max=2.57ms p(90)=109us p(95)=1.12ms
    http_req_sending...: avg=43.66us min=18us med=45us max=943us p(90)=53us p(95)=6.14us
    http_req_tls_handshaking...: avg=8s min=8s med=8s max=8s p(90)=8s p(95)=0s
    http_req_waiting...: avg=141.05ms min=132.18ms med=141.24ms max=389.77ms p(90)=146.22ms p(95)=147.16ms
    http_req_blocked...: avg=32.7us min=9us med=30us max=1.57ms p(90)=6us p(95)=4us
    http_req_tls_handshaking...: avg=8s min=8s med=8s max=8s p(90)=8s p(95)=0s
    http_req_waiting...: avg=141.05ms min=132.18ms med=141.24ms max=389.77ms p(90)=146.22ms p(95)=147.16ms
    iteration_duration...: avg=1.24s min=1.19s med=1.14s max=1.34s p(90)=1.14s p(95)=1.14s
iterations...: 18147 43.389871/s
vus...: 1
vus_max...: 100 min=1 max=100
running (7m00.9s), 000/100 VUs, 18147 complete and 0 interrupted iterations
default: [=====] 000/100 VUs 7m0s
kaan@turkmen load_tests.ulgen %
```

stages: [

- { duration: '1m', target: 50 },
- { duration: '3m', target: 200 },
- { duration: '2m', target: 100 },
- { duration: '1m', target: 0 },

]

stages: [

- { duration: '1m', target: 50 },
- { duration: '3m', target: 200 },
- { duration: '2m', target: 100 },
- { duration: '1m', target: 0 },

]

stages: [

- { duration: '1m', target: 10 },
- { duration: '3m', target: 100 },
- { duration: '2m', target: 50 },
- { duration: '1m', target: 0 },

]



What is Completed? - Can

- Google-OR implementation is completed.
 - User can select the number of vehicles and locations for supply distribution.
 - A prioritized distance matrix is used for route calculating.
 - An optimized route is calculated using Google's Vehicle Routing algorithm.
 - A routing view in Android application is partially completed.
- Local MAC Scanner implementation is completed.
 - Scanning the devices connected to local network is implemented.
 - This data will be sent to backend services periodically to determine the priority of locations.



What is Completed? - Doruk

- Design Goal is created
 - Fully defined the objective of our objective and conducted market research.
 - Developed design principles to aid our progress and implementation of the app and UI.
 - Created a report inclusive of our goal and the exploratory research.
- Initial Wireframe/UI is completed, and App Logo is created
 - The design of the Log in, Sign up, Password & Home Page screens are completed.
 - The interface was made with design principles and our design goal in mind.
- Interview and User Flow are in progress
 - The interview questions are completed, and the user flow has been made up to current progress.

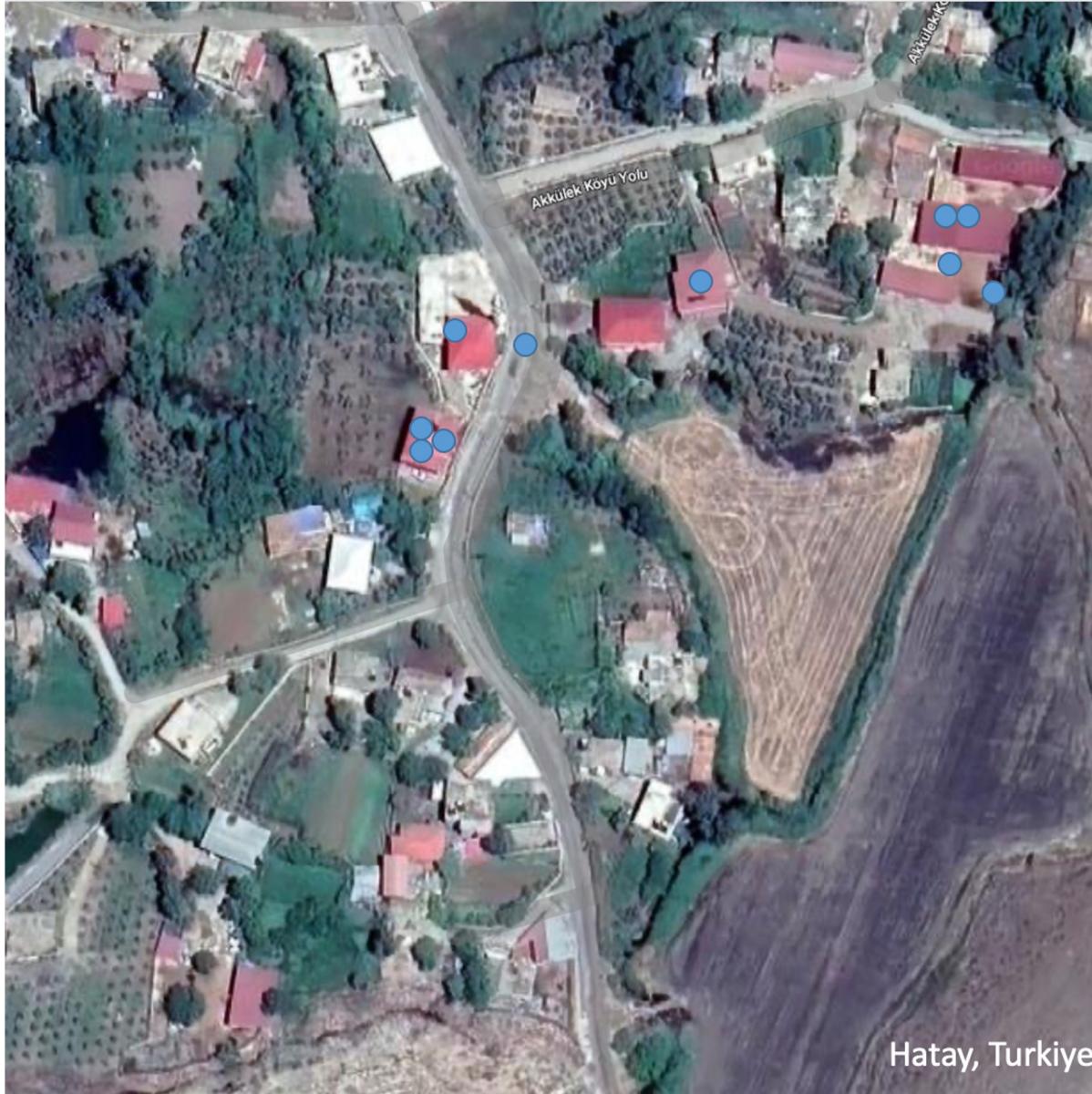


What is Completed? - Aybars

- UI screens in mobile application are completed.
 - These screens are originally designed by UI/UX department their implementation in android studio is completed.
 - Login, register, reset password, start and home screens are completed.
 - Live earthquake table is completed which get its data from Kandilli Observatory.
 - Navigation graph is constructed to navigate between screens.



Visualization - Google-OR (1)



Hatay, Turkiye



Visualization - Google-OR (2)



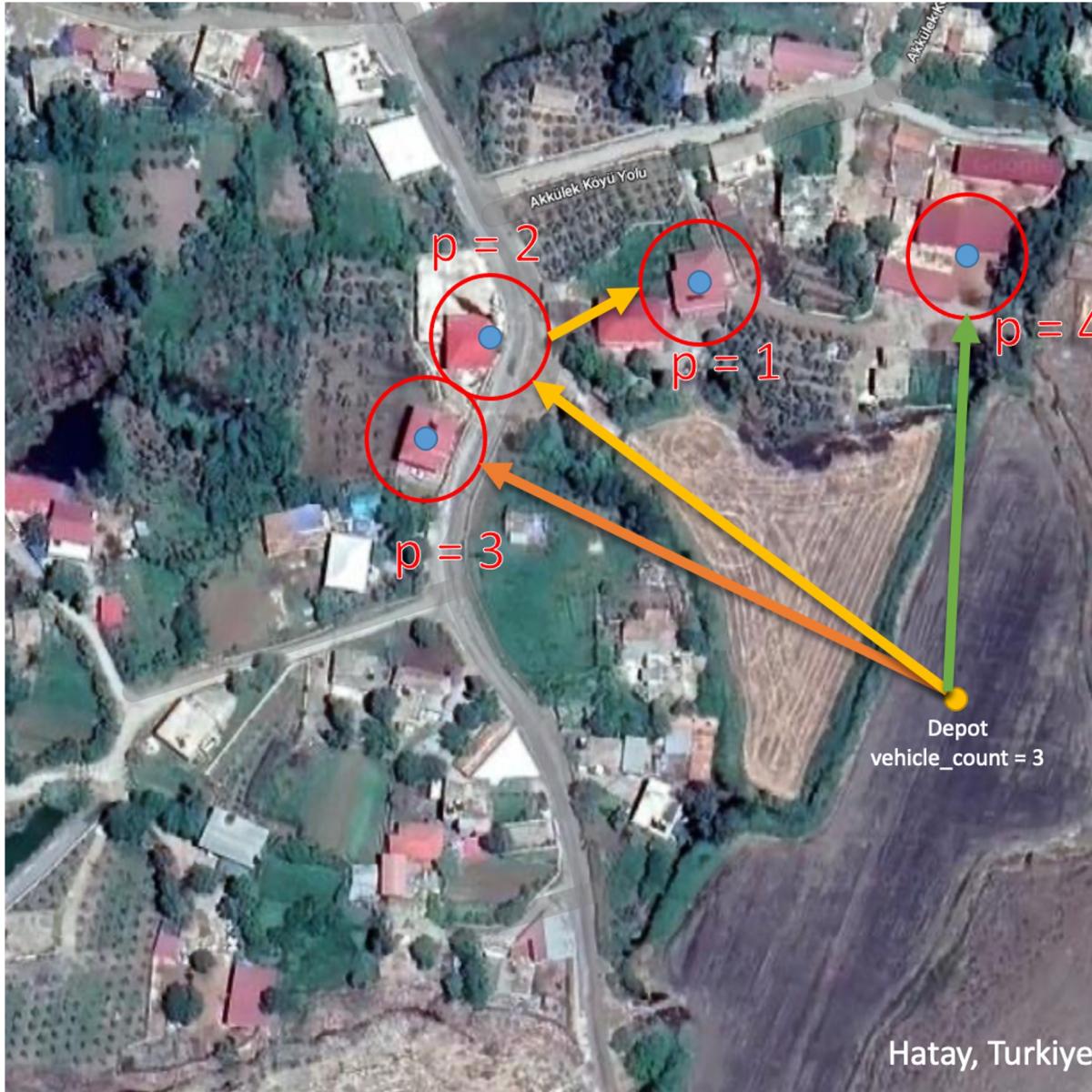


Visualization - Google-OR (3)



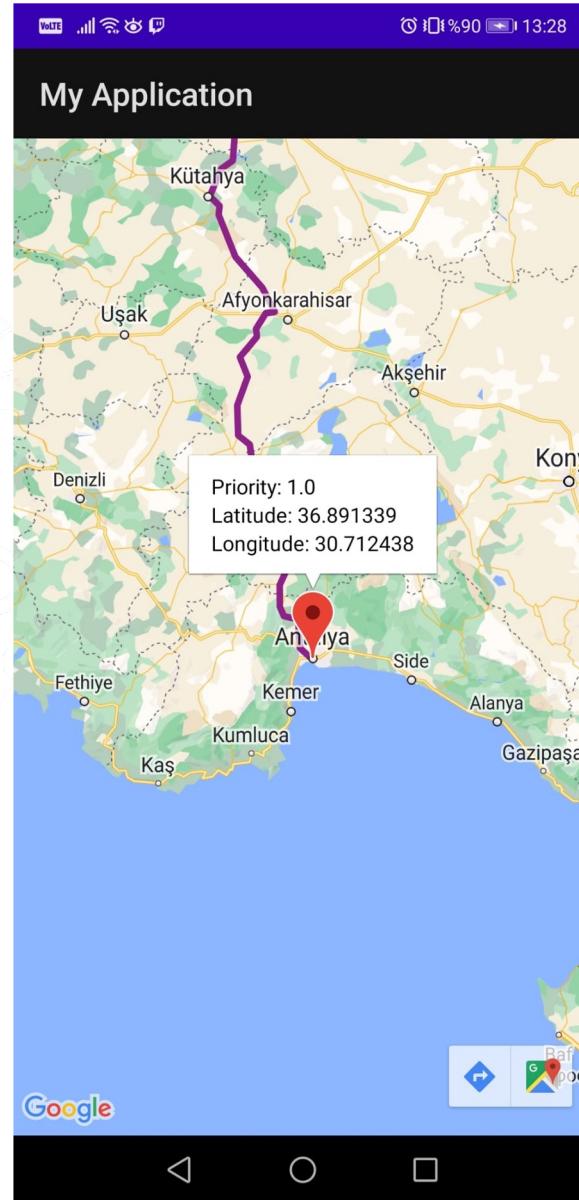
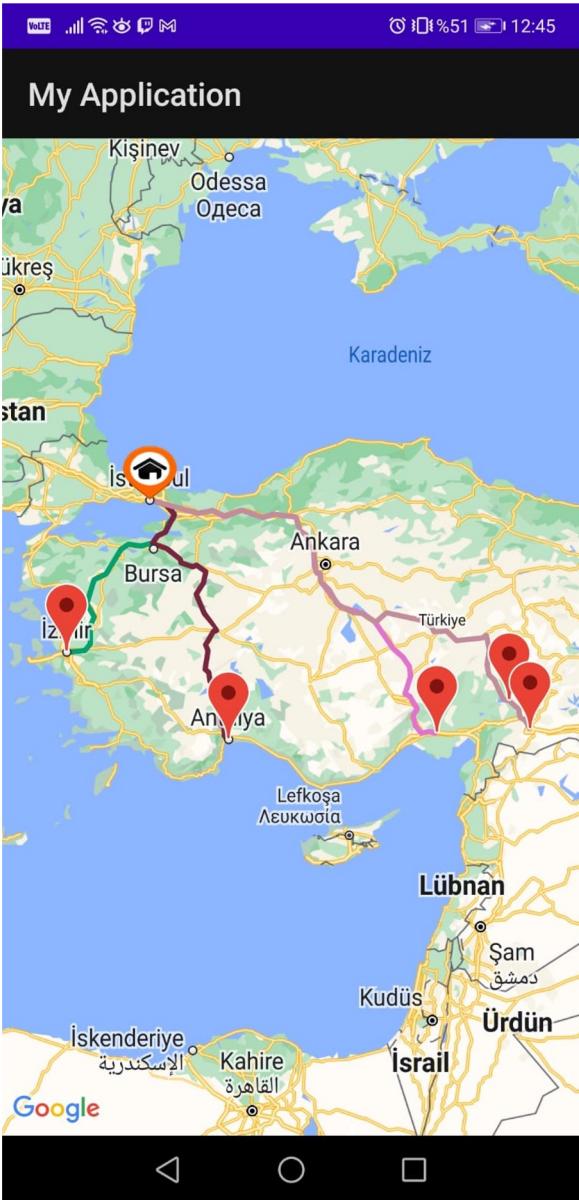


Visualization - Google-OR (4)





Prototype - Google-OR





Design Goal

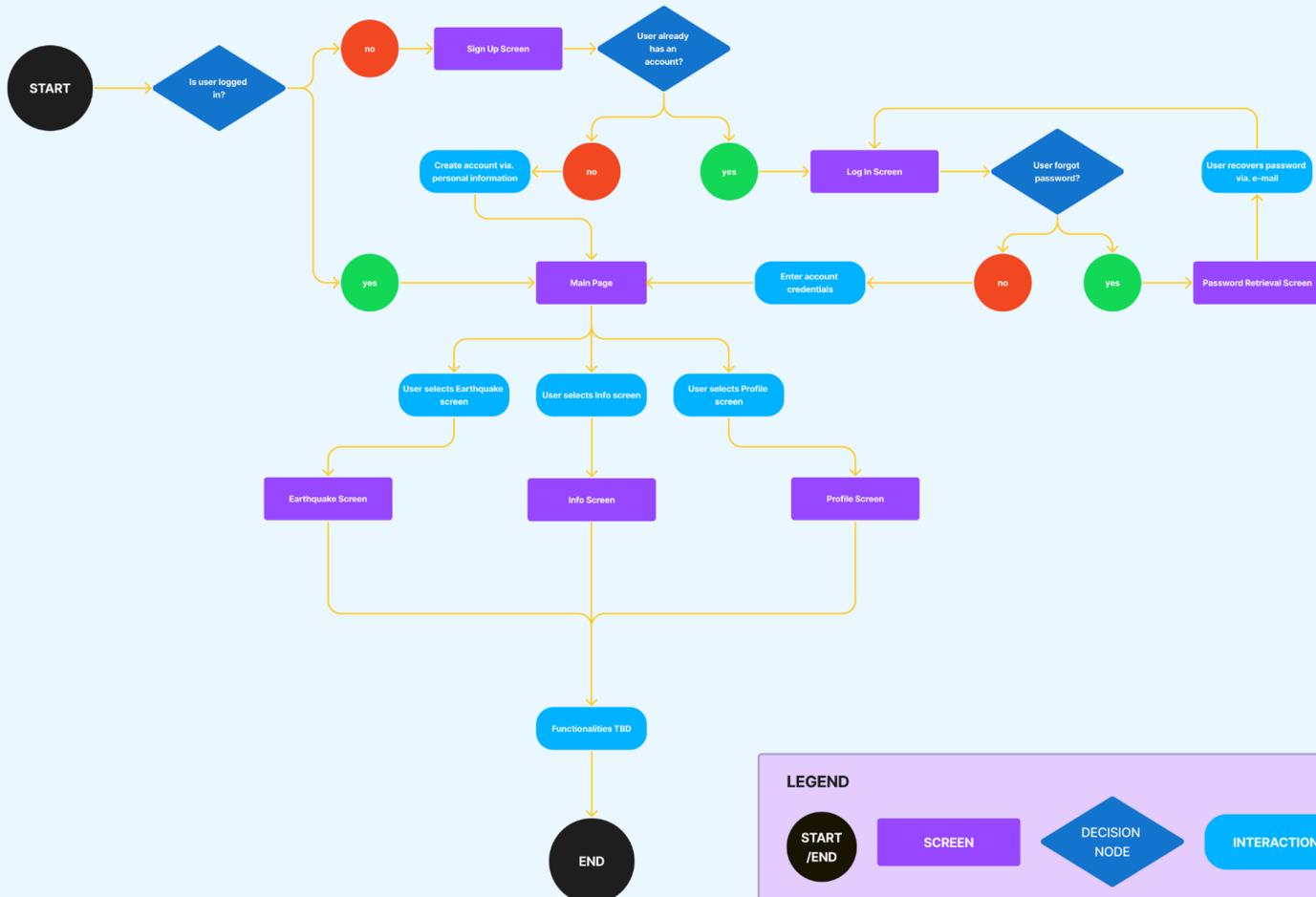
NEEDS	THE LANDSCAPE	OVERVIEW OF THE DESIGN GOAL
<p>What exactly is the extent of the problem we are trying to solve?</p> <p>Communicating with authorities with limited/no resources during crisis</p> <p>Increasing coordination and effectiveness during rescue operations</p> <p>Efficiency is key</p> <p>Necessities</p> <ul style="list-style-type: none">TrustworthyEasy-to-useSecureCompatibleLightweightAccurate <p>In-Depth</p> <p>For Citizens</p> <p>We need to create an application that is trustworthy to the general public, in which the goal of the application is easily understandable and they can easily navigate through the application during the setup process. The application should be compatible with many types of devices, and not just the latest software on the market, as not everyone has it; it should be accessible to everyone.</p> <ul style="list-style-type: none">ClearEase-of-setupSympathetic <p>For Authorities</p> <p>First and foremost, we need our application to gather accurate data, as all of our apps currently planned functions depend on this data; if the data is obsolete, so is our application. We need the clients that will access this data and the features of said data to access it in a quick and understandable way. To make it understandable, visualizations and clean looking images should be used.</p> <ul style="list-style-type: none">No clutterEase-of-accessVisualizations	<p>How are the other solutions currently available?</p> <p>Current Solutions</p> <p>AFAD acil AFET VE AÇIL DİVANI YÖNETİM BAKANLIĞI</p> <ul style="list-style-type: none">View the emergency assembly areasInitiate emergency calls in case of a disasterWatch related videos/content <p>AKUT</p> <ul style="list-style-type: none">Simple interfaceDirectly able to access authorities in case of disasterAssumes the person has access to their mobile device.Assumes the person has access to the internet/communication systems <ul style="list-style-type: none">Some users report it working slow, as well as incorrect information regarding emergency assembly areas.Compatible with iOS 13.0 and above (iPhone 6s and above) or Android 6.0+ (Compatible)Let loved ones know when you are not in danger during a disaster with the touch of a buttonWhistle sound <ul style="list-style-type: none">Easily configurableCan also be used to let loved ones know you are in dangerDoes not operate without a usable messaging system (SMS)No option to contact any authorities (including 112) <p>Sources</p> <p>https://apps.apple.com/tr/app/afad-acil-%C3%A7a%C4%9Fr%C4%B1/id1579326930?it=tr https://play.google.com/store/apps/details?id=tr.gov.icisleri.afad&hl=tr https://www.akut.org.tr/guvendeyim https://apps.apple.com/tr/app/g%C3%BCvendeyim/id1488896334?it=tr https://play.google.com/store/apps/details?id=genele.akut.guvendeyim&hl=tr</p>	<p>Target problem</p> <p>During disasters, it may be not possible to access the internet or any other communication services, thus, a trustworthy and helpful service must be created. Joining this service should be no hassle for the average citizen. Also, increasing the effectiveness of the authorities during such disasters using optimization technologies.</p> <p>Whose problem is this?</p> <p>This problem concerns all citizens who are within an area where an earthquake is likely to strike, or has loved ones that live in such areas. With respect to our geographic location of Turkey, this problem comprises the majority of the public.</p> <p>Why it is important to solve it?</p> <p>During a disaster like an earthquake, accessing information about the whereabouts of those affected in a quick and accurate manner will undoubtedly save lives. Similarly, increasing the effectiveness of coordinated rescue operations of officials, which may prove to be extremely difficult during crisis scenarios, and where every decision impacts how many people will be rescued, is extremely crucial.</p> <p>What can we do?</p> <p>Our application will collect the data of users of their access to their local network and extract information regarding their connectivity activity, which we will then use as an indicator of how many people were within the household at that moment. This data will be regularly stored within our system to then use during an emergency. Also, recommendations will be forwarded to authorities during such disasters for them to distribute their forces in the most effective way with the help of our algorithms and OR solutions. To realize these goals, our application must be kept secure and gain the trust of both users, regarding their data, and authorities, regarding distribution of forces. Thus, our interface should compliment these goals by being friendly, simple, intuitive and by giving users a sense of trust.</p>



User Flow

User flow: Setting up an Ülgen account.

Scenario: Faruk, a father of two, lives in a risky zone and is conscious about earthquakes, and thus wants to create an Ülgen account for himself and his family, as well as check out the applications functionalities.





Prototype - Screens

9:28 ◊ ☰

Ülgen'e hoş geldin!

Olası afet durumlarına karşı sevdiklerinin ve kendinin durumunu yetkililere bildir, hem de mobil cihazına dokunmadan.

Hesap oluştur

Zaten hesabın var mı? Giriş yap

◀ ⚪ □

This screen is the initial welcome screen for the Ülgen app. It features a warm orange background. The top status bar shows the time as 9:28 and various connectivity icons. The main content area starts with a large, bold heading 'Ülgen'e hoş geldin!' (Welcome to Ülgen!). Below this, there is a descriptive paragraph about reporting emergencies via mobile device. At the bottom, there are two prominent blue rounded rectangular buttons: 'Hesap oluştur' (Create Account) on the left and 'Zaten hesabın var mı? Giriş yap' (Already have an account? Log In) on the right. A black navigation bar at the very bottom contains three white icons: a left arrow, a dot, and a square.

9:28 ◊ ☰

Ülgen hesabını oluştur

ad-soyad
e-mail
şifre

Hesap oluşturarak Ülgen Kullanım Şartlarını kabul ediyorum ve Gizlilik Beyanını onaylıyorum.

Hesap oluştur

Zaten hesabın var mı? Giriş yap

◀ ⚪ □

This screen is the account creation page. The top status bar shows the time as 9:28. The main title 'Ülgen hesabını oluştur' (Create Ülgen account) is centered at the top. Below it is a light blue rectangular input field containing three text input boxes labeled 'ad-soyad' (name), 'e-mail' (email), and 'şifre' (password). At the bottom of this field is a checkbox with the text 'Hesap oluşturarak Ülgen Kullanım Şartlarını kabul ediyorum ve Gizlilik Beyanını onaylıyorum.' (I accept the Ülgen Terms of Service and Privacy Statement by creating an account). A large blue rounded rectangular 'Hesap oluştur' (Create Account) button is positioned below the input field. A 'Zaten hesabın var mı? Giriş yap' (Already have an account? Log In) link is located at the bottom. A black navigation bar at the bottom has three white icons: a left arrow, a dot, and a square.

9:29 ◊ ☰

Ülgen hesabına giriş yap

e-mail
şifre

şifreni mi unuttun?

Giriş yap

◀ ⚪ □

This screen is the log-in page. The top status bar shows the time as 9:29. The main title 'Ülgen hesabına giriş yap' (Log in to Ülgen account) is centered at the top. Below it is a light blue rectangular input field containing two text input boxes labeled 'e-mail' (email) and 'şifre' (password). To the right of the password input box is a question 'şifreni mi unuttun?' (Forgot password?). A large blue rounded rectangular 'Giriş yap' (Log In) button is located at the bottom of the input field. A 'Zaten hesabın var mı? Giriş yap' (Already have an account? Log In) link is at the bottom. A black navigation bar at the bottom has three white icons: a left arrow, a dot, and a square.



Prototype - Screens





Prototype - Figma Designs

Ülgen'e hoş geldin!

Olası afet durumlarına karşı sevdiklerinin ve kendinin durumunu yetkililere bildir, hem de mobil cihazına dokunmadan.

[Hesap oluştur](#)

Zaten hesabın var mı? [Giriş yap](#)

Ülgen hesabına giriş yap

e-mail
farukkoc@gmail.com

şifre

[şifreni mi unuttun?](#)

[Giriş yap](#)

Hesabın yok mu? [Hesap oluştur](#)

Hoş geldin!
Ülgen hesabını oluştur

ad-soyad
Faruk Koç

e-mail
farukkoc@gmail.com

şifre

Hesap oluşturarak Ülgen Kullanım Şartlarını kabul ediyorum ve Gizlilik Beyanını onaylıyorum.

[Hesap oluştur](#)

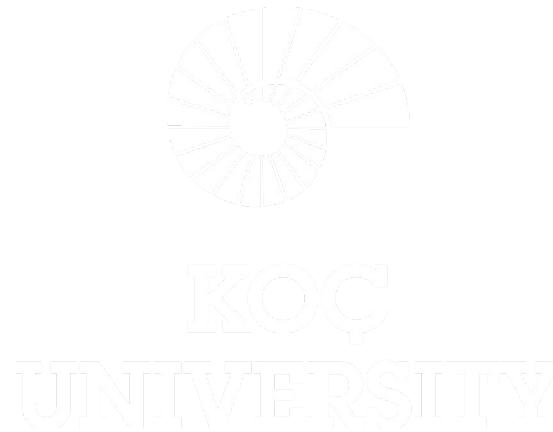
Zaten hesabın var mı? [Giriş yap](#)



Prototype - Figma Designs



A mobile application screen showing a forgot password flow. It features a large circular icon with a lock and a question mark. The text "Şifreni mi unuttun?" is displayed above a message stating "E-posta adresine hesabına tekrar erişebilmen için şifre değiştirme bağlantısı yollayacağız." Below this is an input field for "e-mail" containing "farukkoc@gmail.com". A blue button labeled "Bağlantıyı gönder" is at the bottom. At the very bottom, there are links for "Ya da" and "Giriş yap".



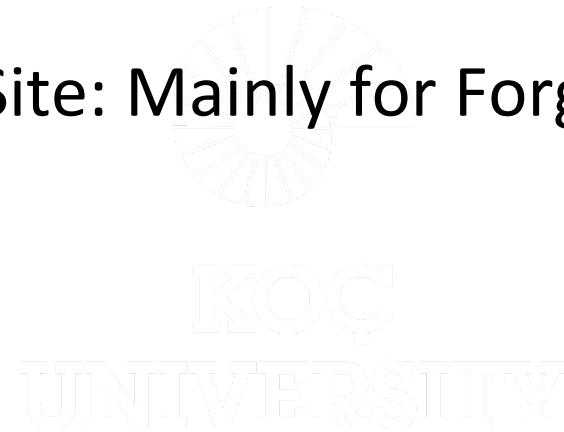
A mobile application screen showing a user profile. It includes a circular profile picture with a stylized 'U' logo, a greeting "Merhaba Faruk!", and a progress bar indicating "Ulgen hesabı doluluk oranı: %50". Below this is a large white box labeled "Kullanıcı genel bilgiler kutusu". To the right are three smaller boxes: "Deprem bilgilendirme kutusu", "Günlük içerik kutusu/görsel içerik", and "Alarm/dündük sesi tuşu(?)". The bottom navigation bar contains icons for a map, home, user, and settings.



What's Next? (1)

Kaan

- Caching the Google-OR Responses (Cache Eviction every 45 min to 1 hr).
- Realtime User Activity.
- Deployment of the Main Site: Mainly for Forgot Password and Email Verification.



Can

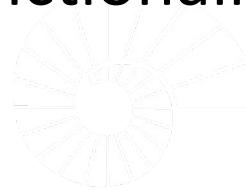
- Finalizing Routing View.
- Heatmap.
- Website of Ulgen: Mainly for Forgot Password and Email Verification.



What's Next? (2)

Aybars

- Completing Implementation all the Application Screens.
- Completing the applications functionality.



Doruk

- Completing all the Application Screens.
- Designing the Website.
- Completing User Research and Conducting Interviews.

