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REBUILD
ICT-enabled integration facilitator and life rebuilding guidance

*Project start date: 01/01/2019 | Duration: 36 months*

# Deliverable: D4.6 Scripted audio/video capturing for the illiterate

DUE DATE OF THE DELIVERABLE: 28-02-2021
ACTUAL SUBMISSION DATE: 26-02-2021

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| **Deliverable Leader** | *CERTH - ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS* |
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# EXECUTIVE SUMMARY

This deliverable is reporting the work done in REBUILD project's WP4 on the design and implementation of a scripted multimedia capturing framework for guiding the immigrants and especially the illiterate among them. Upon their arrival at their new society, illiterate people need guidance for interacting with the public authorities and public or private services. Short audio-visual information available in multiple languages, provided by already integrated migrants is an effective tool towards this direction. The deliverable describes various aspects of the prototype, including technologies, interfaces and usage scenarios.

After a brief introduction, the first chapter of the report is focusing on the framework, its components and actors. The framework instantiation integrated into the overall REBUILD framework is described in the next chapter. The technologies and the tools used are presented in chapter 4. Next, the fulfilment of the functional and non-functional requirements set during the implementation of the system is considered. Finally, conclusions are drawn and future ideas are provided.

This deliverable builds upon D4.2 [1], although the focus has shifted from the design to the implementation and description of the prototype. Design decisions and framework planning reported in D4.2 have been refined and updated during the implementation and testing phase.

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# 1 INTRODUCTION

The project REBUILD aims at improving migrants and refugees' inclusion through the provision of a toolbox of ICT-based solutions aimed to enhance both the effectiveness of the services provided by local public administration and organizations, and the life quality of the migrants.

This project follows a user-centered and participated design approach, aiming at addressing properly real target users' needs, ethical and cross-cultural dimensions, and at monitoring and validating the socio-economic impact of the proposed solution. Both target groups (immigrants/refugees and local public services providers) have been part of a continuous design process; users and stakeholders' engagement is a key success factor addressed both in the Consortium composition and in its capacity to engage relevant stakeholders external to the project. Users are engaged since the beginning of the project through interviews and focus groups; then have been part of the application design, participating in three Co-Creation Workshops organized in the three main piloting countries: Italy, Spain and Greece, chosen for their being the "access gates" to Europe for main immigration routes. Then again, in the 2nd and 3rd years of the project, users' engagement in Test and Piloting events in the three target countries, have helped and will further help the Consortium fine-tuning the REBUILD ICT toolbox before the end of the project.

The key technology solutions proposed are:

- GDPR-compliant migrants' integration related background information gathering with user consent and anonymization of personal information;
- AI-based profile analysis to enable both personalized support and policy making on migration-related issues;
- AI-based needs matching tool, to match migrant needs and skills with services provided by local authorities in EU countries and labour market needs at local and regional level;
- a Digital Companion for migrants enabling personalized two-way communication using chatbots to provide them smart support for easy access to local services (training, health, employment, welfare, etc.) and assessment of the level of integration and understanding of the new society, while providing to local authorities data-driven, easy to use decision supporting tools for enhancing capacities and effectiveness in service provision.

## 1.1 SCOPE AND OBJECTIVES OF THE DELIVERABLE

A Digital Companion, like the one described above, needs to provide the means for removing the language barrier, both in terms of multilingualism as well as illiteracy.

In this context, the knowledge of already integrated migrants should be exploited. Newcomers and illiterate people will trust their fellow men and women, coming from the same ethnic or religious groups, speaking the same languages or even belonging to the same gender. Short audio and video clips communicating instructions on interacting with the public authorities and services or even information on everyday issues and societal attitudes can prove very helpful.

The omnipresent mobile phones can be used for creating the required multimedia content. But the other parts of this information chain are missing. First of all, the need for a specific instructory clip, along with requirements regarding language/ethnicity etc., has to be registered. Subsequently, this need has to be forwarded to the appropriate individual, which can satisfy it, i.e. create the multimedia content with his/her mobile phone, explaining how to achieve the specific task. The instructory clip has to undergo an evaluation procedure and, presumably, be updated over and over again, until its quality reaches a satisfactory level. Finally, the clip has to be forwarded back to the requester and saved into a repository for future use.

This deliverable describes the framework, through which the aforementioned workflow has been achieved, including the prototype, while several other aspects (e.g. security, usability and legal considerations) are taken into account. Design decisions reported in D4.2 have been refined and updated during the prototype implementation and testing phase.

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# 2 THE TASK SOLVING FRAMEWORK

In this chapter, the framework of the implemented solution will be described. In general, the solution consists of a basic task management workflow and a translation workflow, built on top of the task management workflow.

## 2.1 TASK MANAGEMENT WORKFLOW

The task management workflow is depicted in the following figure.

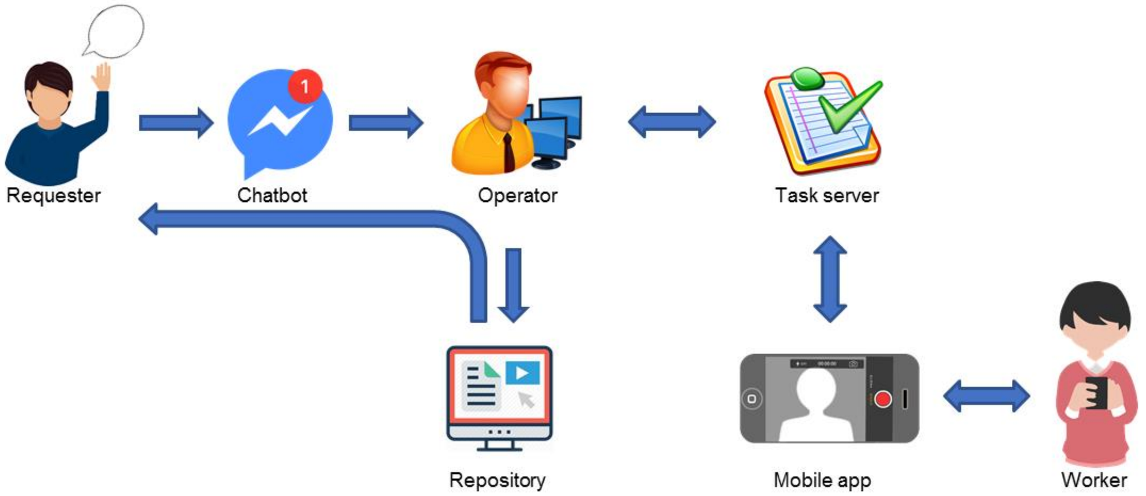


*Figure 1: Task management workflow*

The requester expresses a request through the Chatbot. The operator receives a notification and creates a new task on the task server. The mobile app of the worker is notified and the worker solves the task. In an iterative process, the operator evaluates the solved task and suggests improvements to the worker. When the operator is satisfied with the task solution, the solved task is stored in the repository and a reference link is sent to the requester. Alternatively, when a similar task has been solved before, the operator can retrieve its solution and serve it to the requester immediately, without the intervention of the worker.

This workflow is generic by design, so that it fits to a plethora of relevant use cases and domains.

### 2.1.1 Actors

The actors, between which the information exchange takes place, are the following:

- The **requester**, looking for information on a specific topic.
- The **operator** of the system, transforming the request to a task and evaluating the answers.
- The **worker**, solving the task.

### 2.1.2 Modules

The software modules providing services to the actors are the following:

- The **chatbot**, which is described in D4.4 [2] and delivered with D4.8 [3], is one of the key components of the Digital Companion. It is a rule-based system that will be able to reply to common questions from migrants with data coming from the analysis modules. A routing component of the chatbot will be responsible to forward specific requests to community members, in this case to the operator and communicate solved tasks back to the requester.
- The **task server**, operated by the operator for creating and managing tasks. It consists of several graphical interfaces, dedicated to the task management and evaluation.
- The **mobile client**, operated by the worker, accepting tasks from the task manager, recording material for solving the tasks and sending the material to task server. Several evaluation/update iterations may occur between the operator and the worker, until the material reaches a satisfactory quality and is accepted for delivery to the requester.
- The **repository**, storing the already evaluated and accepted content and making it accessible to the requester through a reference link. Content will be enriched with metadata (keywords), provided by the operator or the worker, for enabling solved task search & retrieval, so that future requests can be answered without the help of a worker, whenever a task has been answered before.

The task server and mobile app communication is depicted in the following figure.

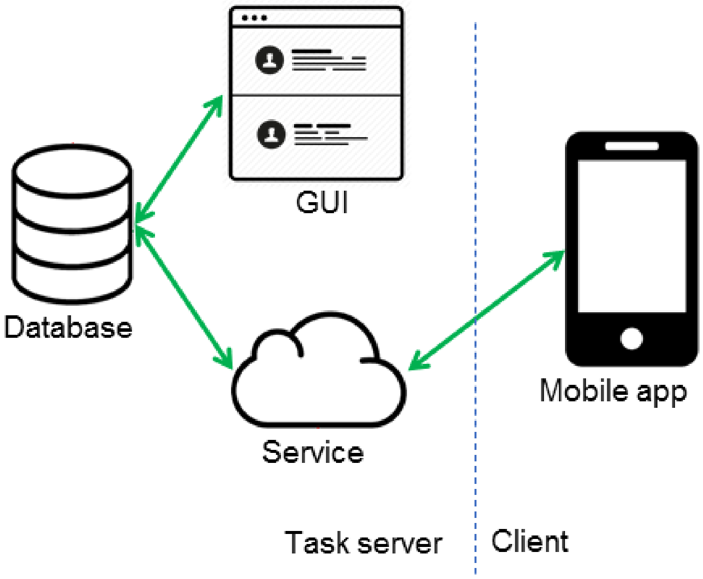


*Figure 2: Task server to mobile app communication*

As seen in the figure, the task server consists of several components:

- a GUI for creating and managing tasks, as well as for evaluating answers,
- a database for storing tasks
- a service for the communication with the mobile app

## 2.2 Translation workflow

The translation workflow, based on top of the generic task management workflow, is depicted in the following figure.

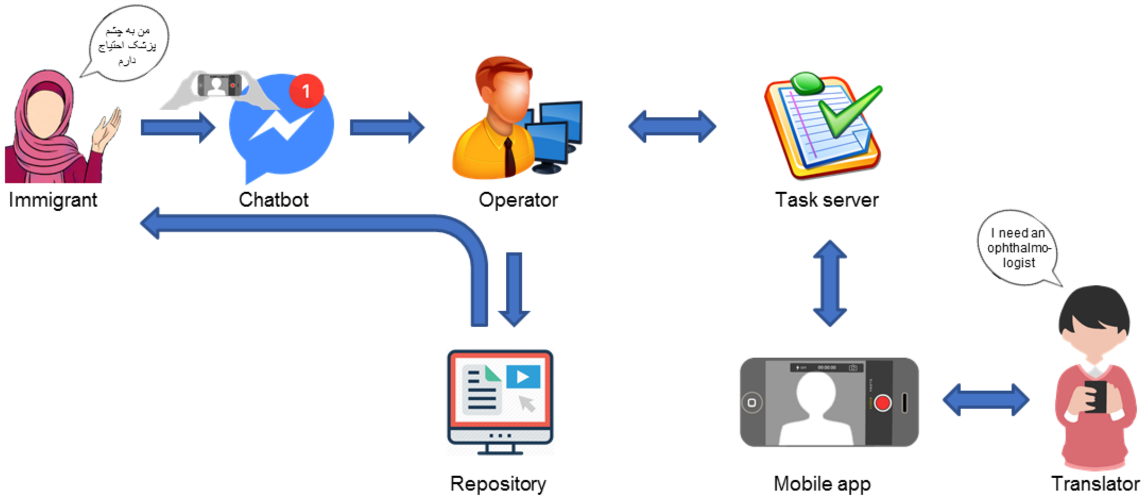


*Figure 3: Translation workflow*

The requester (immigrant) would like to expresses a request through the chatbot. Since the requester is illiterate (cannot speak or write the local language), s/he posts a brief video through the chatbot, explaining the request/problem. The operator receives a notification along with the video and creates a new task on the task server. The mobile app of the translator is notified and the translator translates the request. In an iterative process, the operator asks the translator to create a video with instructions on how to satisfy the immigrant's need. The instructory video is then stored in the repository and a reference link is sent to the immigrant. The creator of the instructory video could, of course, be a different person than the translator.

### 2.2.1 Actors

Again, as explained in the requirements section, the actors, between which the information exchange takes place, are the following:

- The **immigrant**, expressing a need in his/her mother language.
- The **operator** of the system, transforming the request to a task and evaluating the answers.
- The **translator**, translating the request and creating an instructory video with the help of the operator.

### 2.2.2 Modules

The software modules providing services to the actors are the same as in the task management scenario:

- The **chatbot**, with the difference that this time it accepts also a request video from the immigrant.

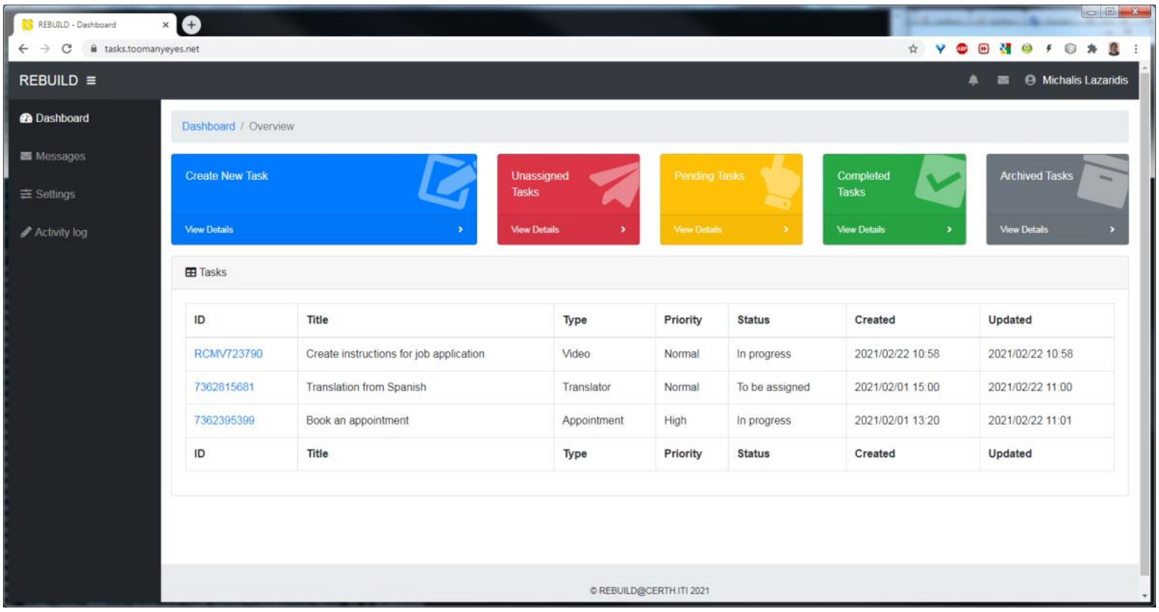
- The **task server**, where this time more than two persons can interact (operator, translator, solution video creator).
- The **mobile client**, operated by the translator and, if not the same person, by the creator of the video.
- The **repository**, storing the instructory videos.

## 2.3 THE IMPLEMENTED SOLUTION

From the above mentioned modules, the Chatbot implementation will be described in D4.8 [3]. The current deliverable describes the implementation of the task server, the mobile client and the repository.

### 2.3.1 Task server

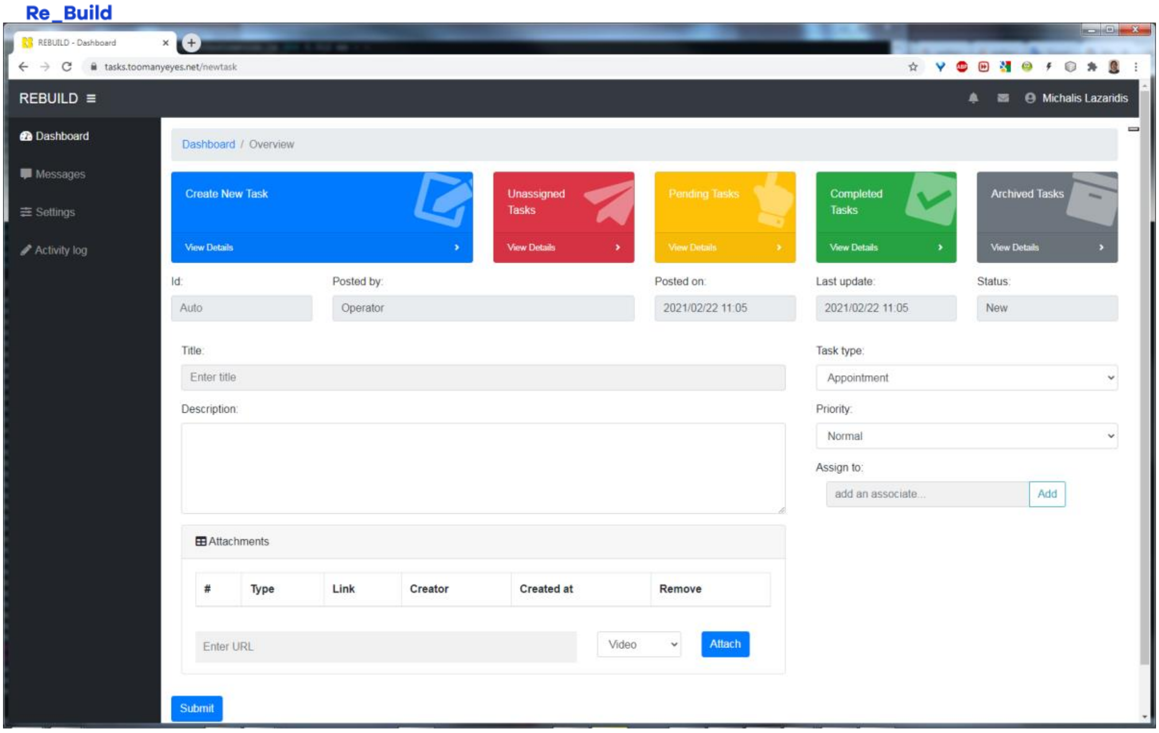
The main interface of the task server is the task server dashboard, depicted below.



| ID | Title | Type | Priority | Status | Created | Updated |
|---|---|---|---|---|---|---|
| RCMV723790 | Create instructions for job application | Video | Normal | In progress | 2021/02/22 10:58 | 2021/02/22 10:58 |
| 7362815681 | Translation from Spanish | Translator | Normal | To be assigned | 2021/02/01 15:00 | 2021/02/22 11:00 |
| 7362395399 | Book an appointment | Appointment | High | In progress | 2021/02/01 13:20 | 2021/02/22 11:01 |
| ID | Title | Type | Priority | Status | Created | Updated |

*Figure 4: The task server dashboard*

Through its visual interface, the operator can create and manage tasks.



Id: Auto
Posted by: Operator
Posted on: 2021/02/22 11:05
Last update: 2021/02/22 11:05
Status: New

Title: Enter title
Task type: Appointment
Description:
Priority: Normal
Assign to: add an associate...

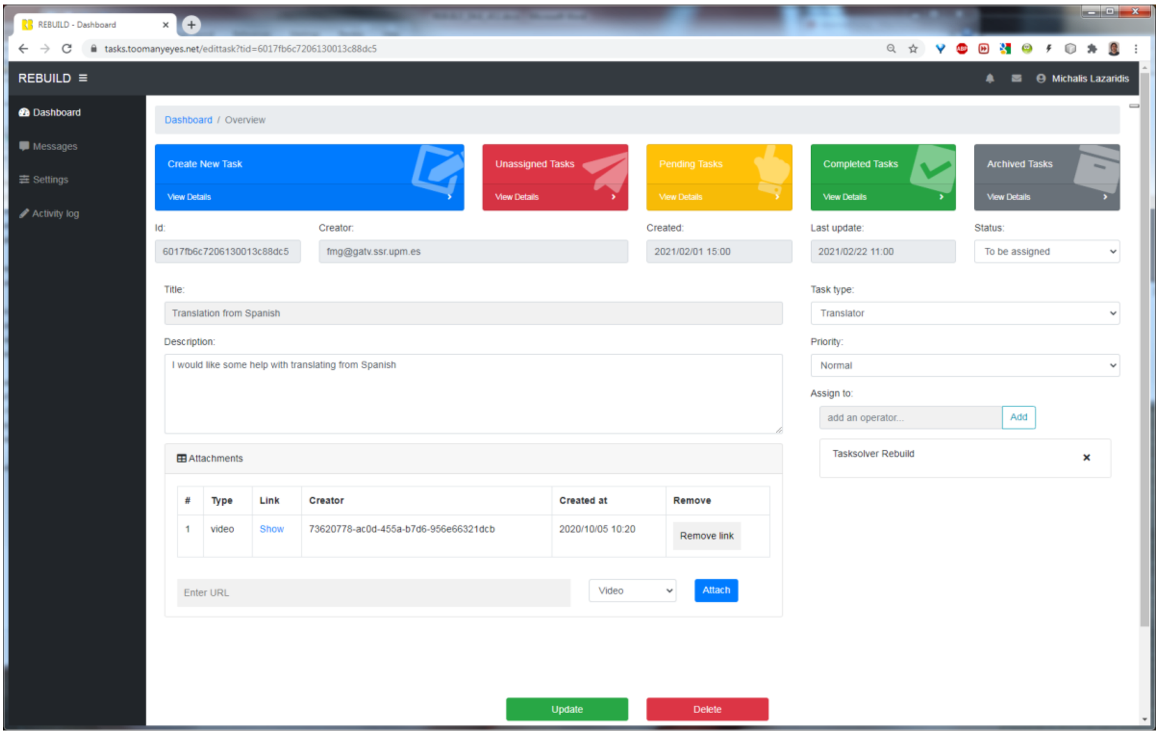
Attachments

| # | Type | Link | Creator | Created at | Remove |
|---|---|---|---|---|---|

Enter URL — Video

*Figure 5: Task creation interface*

During creation or update of the task, the operator can set all required information, including a title, a detailed description, a task type (Video, Appointment or Translator), and a priority (Normal, High). Apart from those, the operator can attach files (videos, images, etc.) to the task and assign it to one or more task solvers (e.g. translators).



Id: 6017fb6c7206130013c88dc5
Creator: fmg@gatv.ssr.upm.es
Created: 2021/02/01 15:00
Last update: 2021/02/22 11:00
Status: To be assigned

Title: Translation from Spanish
Task type: Translator
Description: I would like some help with translating from Spanish
Priority: Normal
Assign to: add an operator...
Tasksolver Rebuild ×

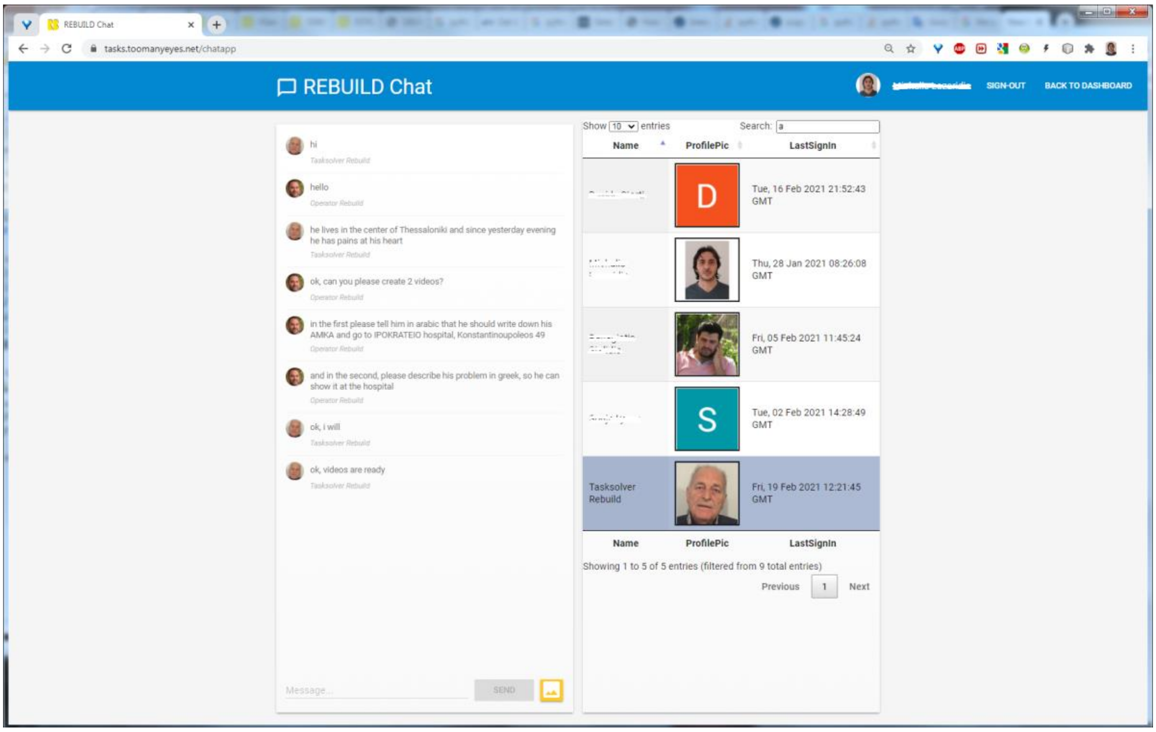
Attachments

| # | Type | Link | Creator | Created at | Remove |
|---|---|---|---|---|---|
| 1 | video | Show | 73620778-ac0d-455a-b7d6-956e66321dcb | 2020/10/05 10:20 | Remove link |

Enter URL — Video

*Figure 6: Task update interface*

The task server optionally includes a chat interface, for the communication between the operator and the task solvers.



hi
Tasksolver Rebuild

hello
Operator Rebuild

he lives in the center of Thessaloniki and since yesterday evening he has pains at his heart
Tasksolver Rebuild

ok, can you please create 2 videos?
Operator Rebuild

in the first please tell him in arabic that he should write down his AMKA and go to IPOKRATEIO hospital, Konstantinoupoleos 49
Operator Rebuild

and in the second, please describe his problem in greek, so he can show it at the hospital
Operator Rebuild

ok, i will
Tasksolver Rebuild

ok, videos are ready
Tasksolver Rebuild

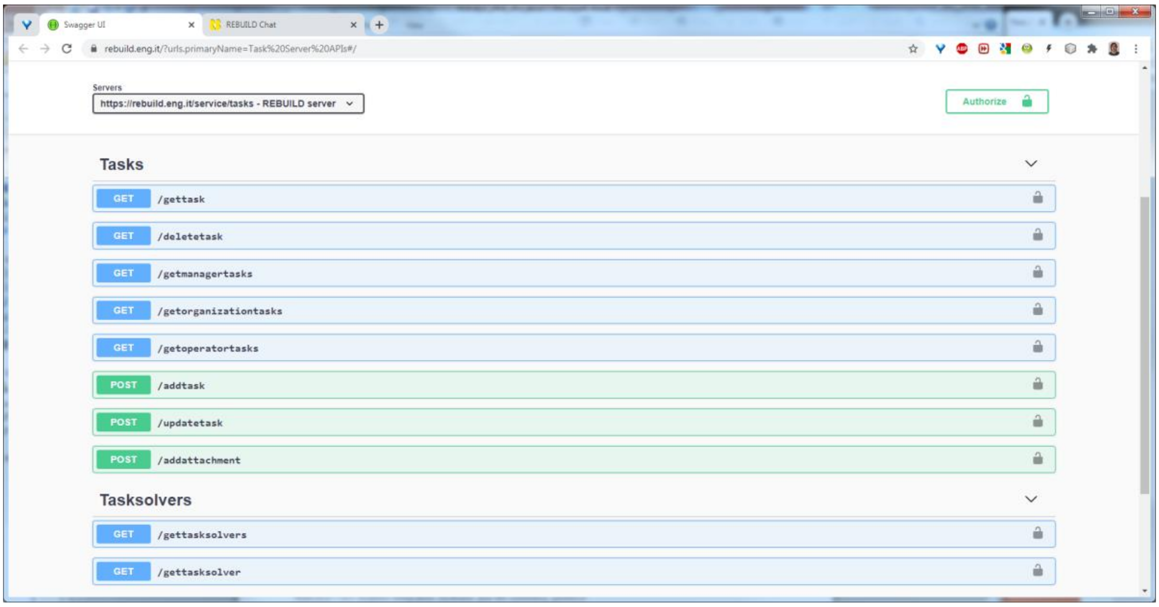
Show 10 entries Search: a

| Name | ProfilePic | LastSignIn |
|---|---|---|
| [redacted] | D | Tue, 16 Feb 2021 21:52:43 GMT |
| [redacted] | | Thu, 28 Jan 2021 08:26:08 GMT |
| [redacted] | | Fri, 05 Feb 2021 11:45:24 GMT |
| [redacted] | S | Tue, 02 Feb 2021 14:28:49 GMT |
| Tasksolver Rebuild | | Fri, 19 Feb 2021 12:21:45 GMT |
| Name | ProfilePic | LastSignIn |

Showing 1 to 5 of 5 entries (filtered from 9 total entries)

*Figure 7: Chat interface*

Apart from the visual interfaces, the task server provides several services for managing the tasks through a Swagger interface. These services are to be called from the Chatbot (for task creation), the visual interface (for task management) and the task solver app (for solving the task).



Servers
https://rebuild.eng.it/service/tasks - REBUILD server

Tasks

- GET /gettask
- GET /deletetask
- GET /getmanagertasks
- GET /getorganizationtasks
- GET /getoperatortasks
- POST /addtask
- POST /updatetask
- POST /addattachment

Tasksolvers

- GET /gettasksolvers
- GET /gettasksolver

*Figure 8: Task server Swagger interface*

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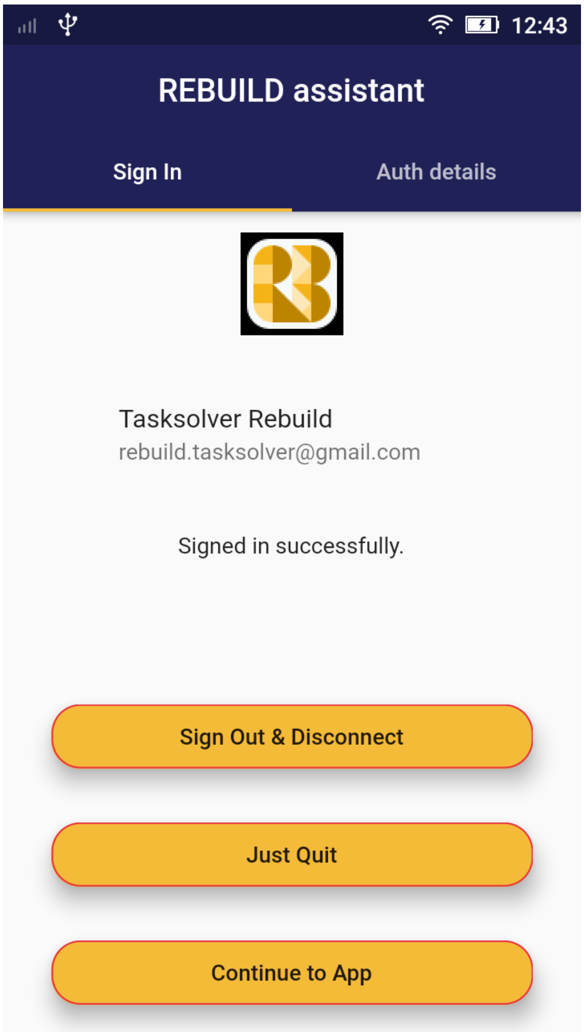
## 2.3.2 Task solver app

The task solver application is the application of the workers/translators. Through it, the task solvers can receive the tasks assigned to them, create their solutions and send them back to the operators. Google Firebase is used for authenticating the users through their gmail account.

After installing the app, the user has to log in to the app through his/her gmail account.

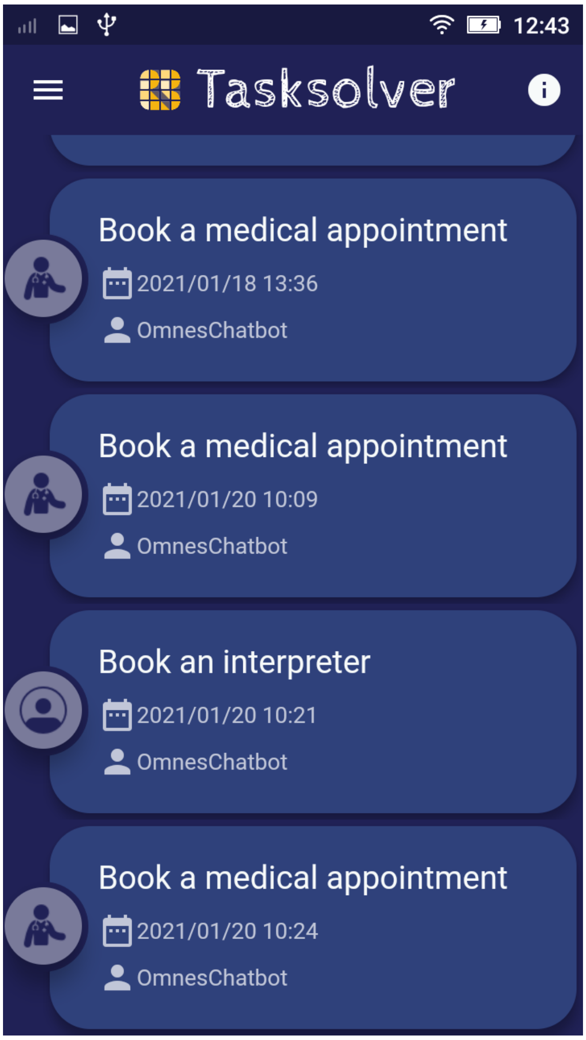


Tasksolver Rebuild
rebuild.tasksolver@gmail.com

Signed in successfully.

*Figure 9: Task solver log in interface*

In the next screen, the task solver receives a list of all tasks assigned to him/her.



Book a medical appointment
2021/01/18 13:36
OmnesChatbot

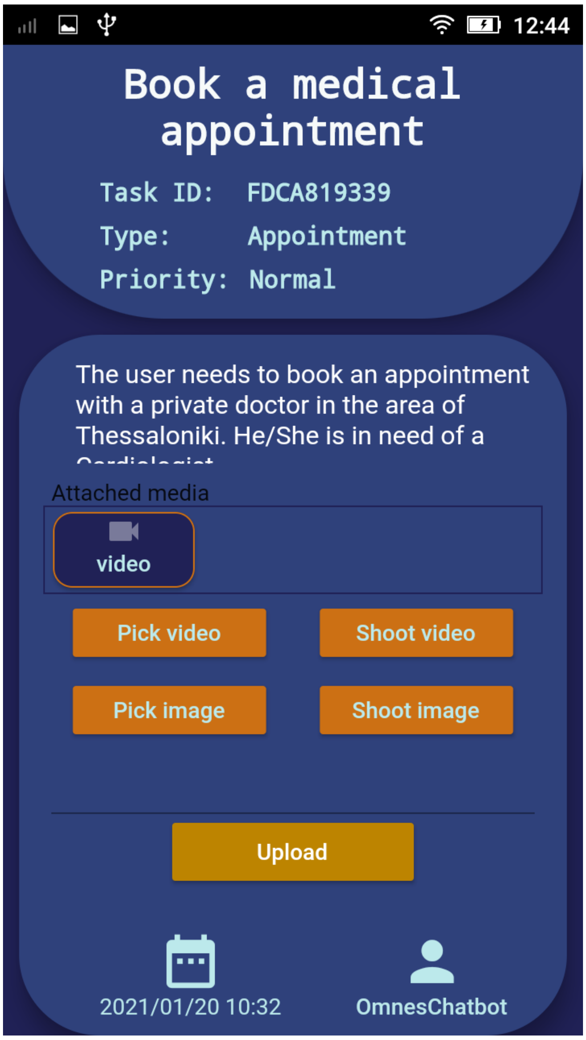
Book a medical appointment
2021/01/20 10:09
OmnesChatbot

Book an interpreter
2021/01/20 10:21
OmnesChatbot

Book a medical appointment
2021/01/20 10:24
OmnesChatbot

*Figure 10: Task solver assigned tasks*

The task solver can them pick a task and view all related information.



12:44

Book a medical appointment

Task ID: FDCA819339

Type: Appointment

Priority: Normal

The user needs to book an appointment with a private doctor in the area of Thessaloniki. He/She is in need of a Cardiologist

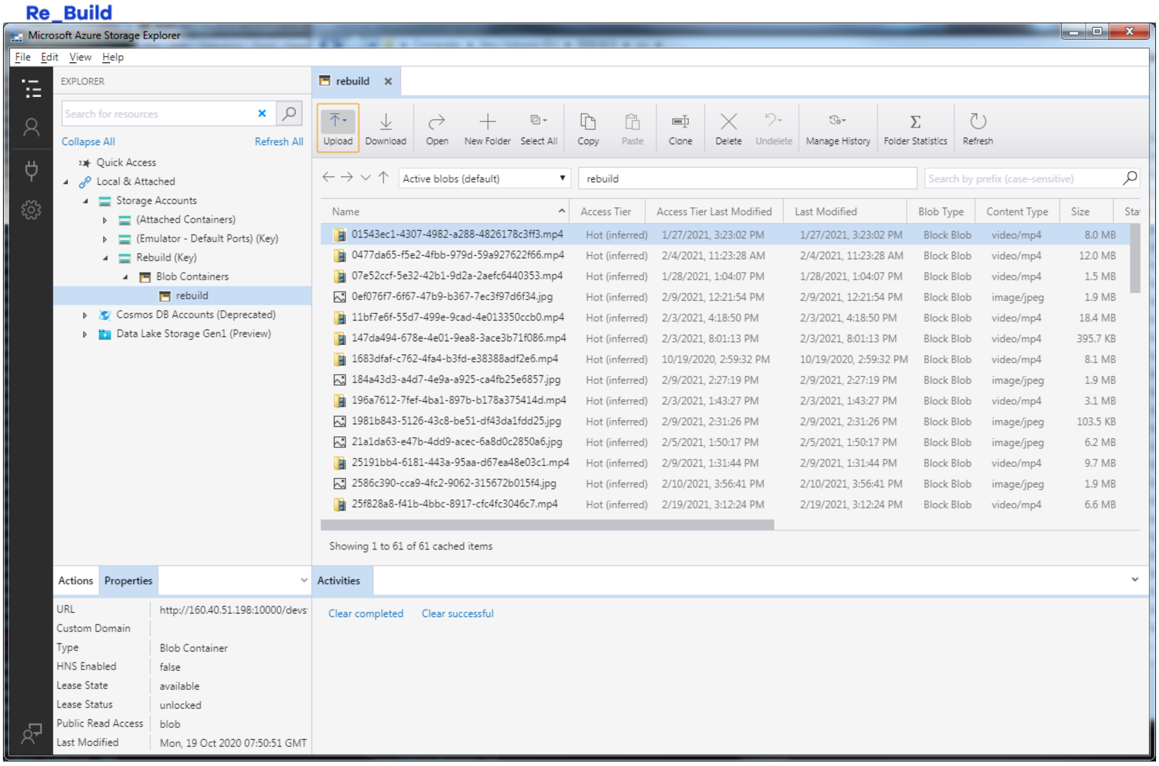
Attached media

*Figure 11: Task solver details interface*

The task solver is then able to upload images and/or videos in order to solve the task. More details on the use of the task solver app can be found in the Task solver manual, provided as an Annex.

### 2.3.3 Repository

For the storage of the produced content, a local repository has been designed and implemented, based on Azurite, which is a local instance of Microsoft Azure Storage. The repository provides file uploading and servicing capabilities, used for storing instructory material. The content can be managed through a Microsoft Azure Storage Explorer. A wrapper service has been developed around Azurite, that facilitates the communication between uploaders/downloaders and the repository.



| Name | Access Tier | Access Tier Last Modified | Last Modified | Blob Type | Content Type | Size | Sta |
|---|---|---|---|---|---|---|---|
| 01543ec1-4307-4982-a288-4826178c3ff3.mp4 | Hot (inferred) | 1/27/2021, 3:23:02 PM | 1/27/2021, 3:23:02 PM | Block Blob | video/mp4 | 8.0 MB | |
| 0477da65-f5e2-4fbb-979d-59a927622f66.mp4 | Hot (inferred) | 2/4/2021, 11:23:28 AM | 2/4/2021, 11:23:28 AM | Block Blob | video/mp4 | 12.0 MB | |
| 07e52ccf-5e32-42b1-9d2a-2aefc6440353.mp4 | Hot (inferred) | 1/28/2021, 1:04:07 PM | 1/28/2021, 1:04:07 PM | Block Blob | video/mp4 | 1.5 MB | |
| 0ef076f7-6f67-47b9-b367-7ec3f97d6f34.jpg | Hot (inferred) | 2/9/2021, 12:21:54 PM | 2/9/2021, 12:21:54 PM | Block Blob | image/jpeg | 1.9 MB | |
| 11bf7e6f-55d7-499e-9cad-4e013350ccb0.mp4 | Hot (inferred) | 2/3/2021, 4:18:50 PM | 2/3/2021, 4:18:50 PM | Block Blob | video/mp4 | 18.4 MB | |
| 147da494-678e-4e01-9ea8-3ace3b71f086.mp4 | Hot (inferred) | 2/3/2021, 8:01:13 PM | 2/3/2021, 8:01:13 PM | Block Blob | video/mp4 | 395.7 KB | |
| 1683dfaf-c762-4fa4-b3fd-e38388adf2e6.mp4 | Hot (inferred) | 10/19/2020, 2:59:32 PM | 10/19/2020, 2:59:32 PM | Block Blob | video/mp4 | 8.1 MB | |
| 184a43d3-a4d7-4e9a-a925-ca4fb25e6857.jpg | Hot (inferred) | 2/9/2021, 2:27:19 PM | 2/9/2021, 2:27:19 PM | Block Blob | image/jpeg | 1.9 MB | |
| 196a7612-7fef-4ba1-897b-b178a375414d.mp4 | Hot (inferred) | 2/3/2021, 1:43:27 PM | 2/3/2021, 1:43:27 PM | Block Blob | video/mp4 | 3.1 MB | |
| 1981b843-5126-43c8-be51-df43da1fdd25.jpg | Hot (inferred) | 2/9/2021, 2:31:26 PM | 2/9/2021, 2:31:26 PM | Block Blob | image/jpeg | 103.5 KB | |
| 21a1da63-e47b-4dd9-acec-6a8d0c2850a6.jpg | Hot (inferred) | 2/5/2021, 1:50:17 PM | 2/5/2021, 1:50:17 PM | Block Blob | image/jpeg | 6.2 MB | |
| 25191bb4-6181-443a-95aa-d67ea48e03c1.mp4 | Hot (inferred) | 2/9/2021, 1:31:44 PM | 2/9/2021, 1:31:44 PM | Block Blob | video/mp4 | 9.7 MB | |
| 2586c390-cca9-4fc2-9062-315672b015f4.jpg | Hot (inferred) | 2/10/2021, 3:56:41 PM | 2/10/2021, 3:56:41 PM | Block Blob | image/jpeg | 1.9 MB | |
| 25f828a8-f41b-4bbc-8917-cfc4fc3046c7.mp4 | Hot (inferred) | 2/19/2021, 3:12:24 PM | 2/19/2021, 3:12:24 PM | Block Blob | video/mp4 | 6.6 MB | |

Showing 1 to 61 of 61 cached items

| | |
|---|---|
| URL | http://160.40.51.198:10000/devs |
| Custom Domain | |
| Type | Blob Container |
| HNS Enabled | false |
| Lease State | available |
| Lease Status | unlocked |
| Public Read Access | blob |
| Last Modified | Mon, 19 Oct 2020 07:50:51 GMT |

*Figure 12: Microsoft Azure Storage Explorer*

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# 3 INTEGRATION IN REBUILD

In the previous chapter, the task solving framework has been described. In this chapter, the framework will be demonstrated as it has been integrated into the REBUILD overall framework. In particular, the OMNES health scenario of REBUILD will be demonstrated, as it interlocks with the Digital Companion.

## 3.1 INTRODUCTION TO HEALTH SCENARIO

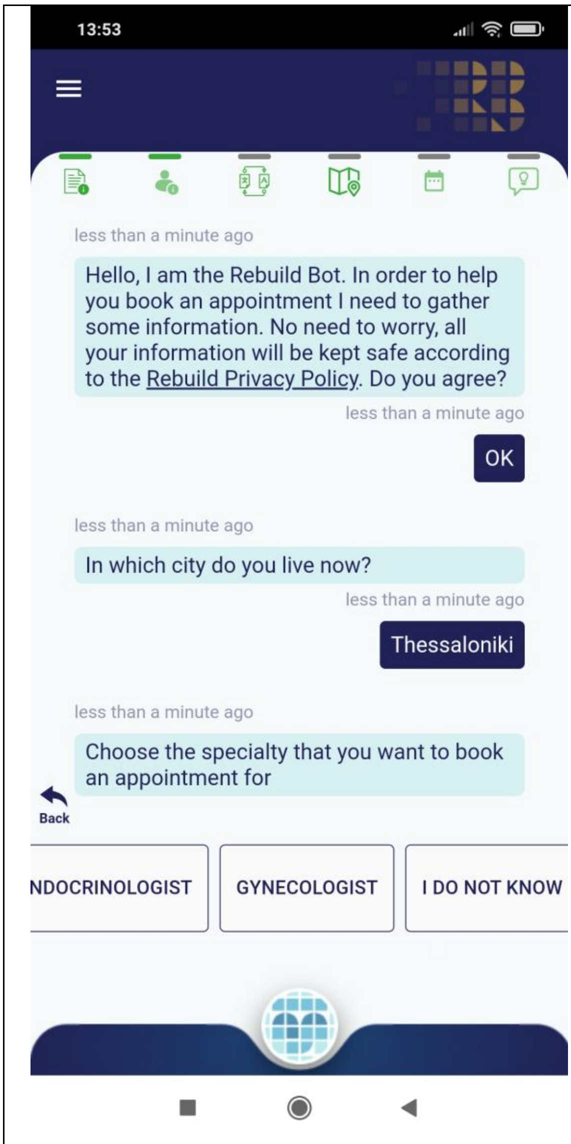
During the Health scenario, the immigrant accesses the REBUILD framework through the Digital Companion in the REBUILD mobile app. After providing some information about him/herself and choosing the Health domain, the user is guided through the Health conversation tree of OMNES. There are 3 points at which the Task Solving framework intervenes in this scenario:

- When the user has not sufficient linguistic knowledge to follow the conversation tree of the Digital Companion (Task type: Video).
- When the user allows the operator to book a doctor appointment for him/her (Task type: Appointment).
- When the user requests the physical presence of a translator during his/her medical appointment (Task type: Translator).

In the REBUILD framework, requests are sent to the operator, sitting in front of the REBUILD dashboard. The REBUILD dashboard is implementing some of the functionalities of the Task Server dashboard. The operator can assign the tasks to a task solver or solve the tasks himself. In the above mentioned task types, the task solvers are needed for the Video task type and optionally for the Translator task type. In the following sections, the 3 cases are described in more detail through screenshot of the Digital Companion, the REBUILD Dashboard and the Task Solver application.

## 3.2 VIDEO TASK TYPE

The immigrant enters the REBUILD application.



13:53

less than a minute ago

Hello, I am the Rebuild Bot. In order to help you book an appointment I need to gather some information. No need to worry, all your information will be kept safe according to the Rebuild Privacy Policy. Do you agree?

less than a minute ago

OK

less than a minute ago

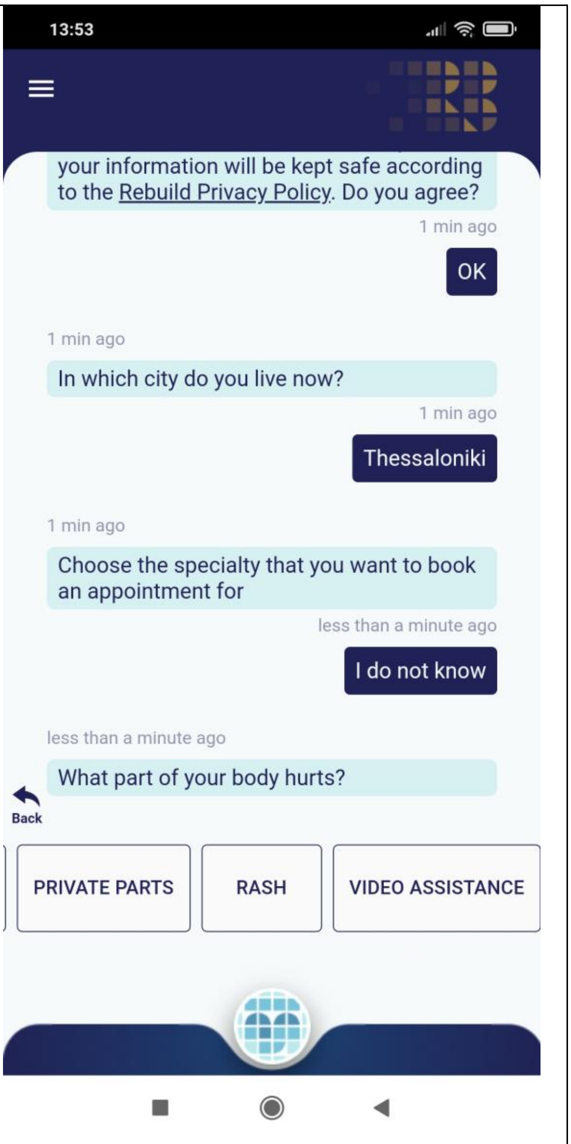
In which city do you live now?

less than a minute ago

Thessaloniki

less than a minute ago

Choose the specialty that you want to book an appointment for



13:53

your information will be kept safe according to the Rebuild Privacy Policy. Do you agree?

1 min ago

OK

1 min ago

In which city do you live now?

1 min ago

Thessaloniki

1 min ago

Choose the specialty that you want to book an appointment for

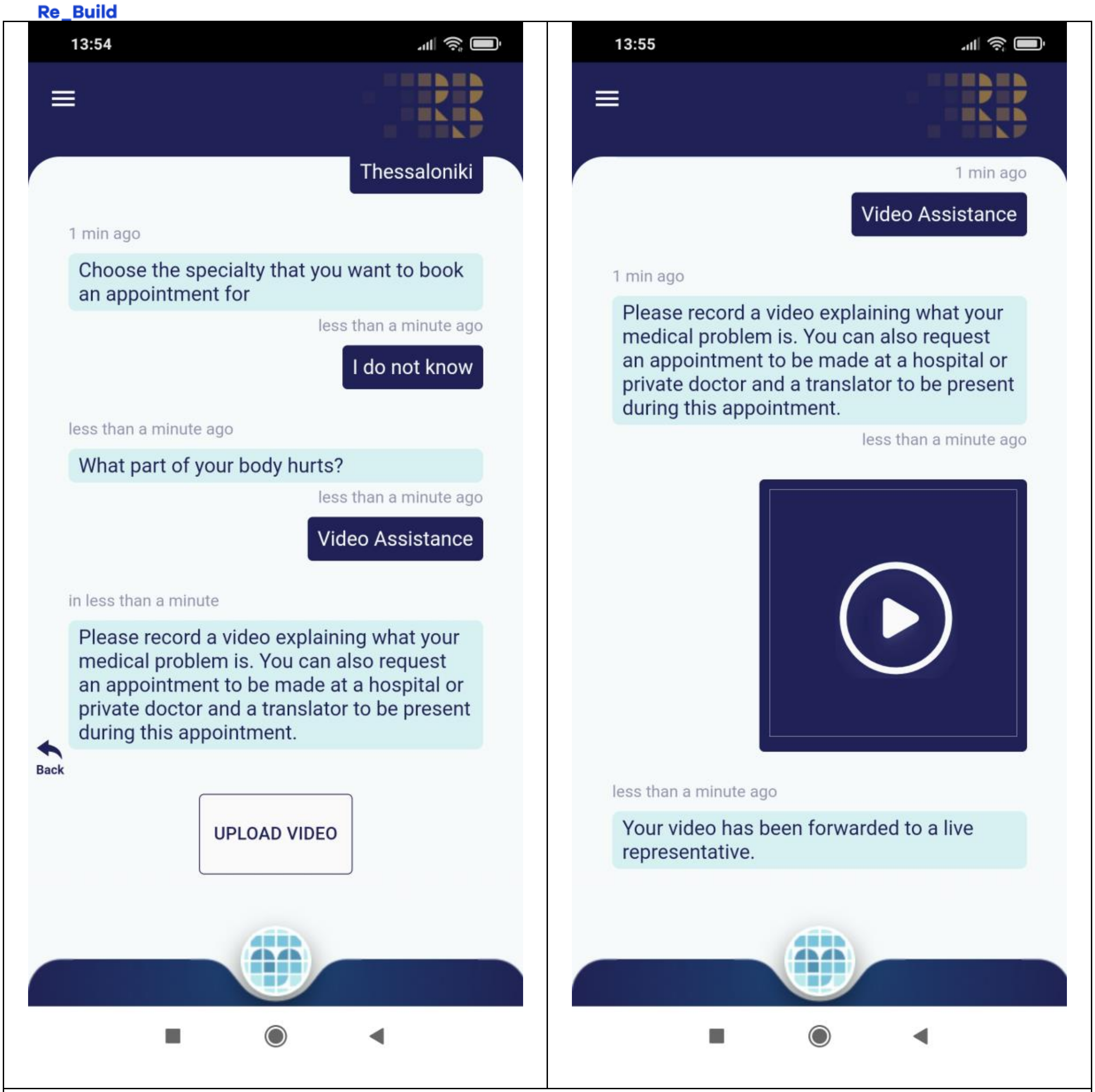
less than a minute ago

I do not know

less than a minute ago

What part of your body hurts?

Digital Companion: The immigrant lacks sufficient linguistic knowledge to follow the conversation tree. The Digital Companion offers video assistance.



13:54

Thessaloniki

1 min ago

Choose the specialty that you want to book an appointment for

less than a minute ago

I do not know

less than a minute ago

What part of your body hurts?

less than a minute ago

Video Assistance

in less than a minute

Please record a video explaining what your medical problem is. You can also request an appointment to be made at a hospital or private doctor and a translator to be present during this appointment.

13:55

1 min ago

Video Assistance

1 min ago

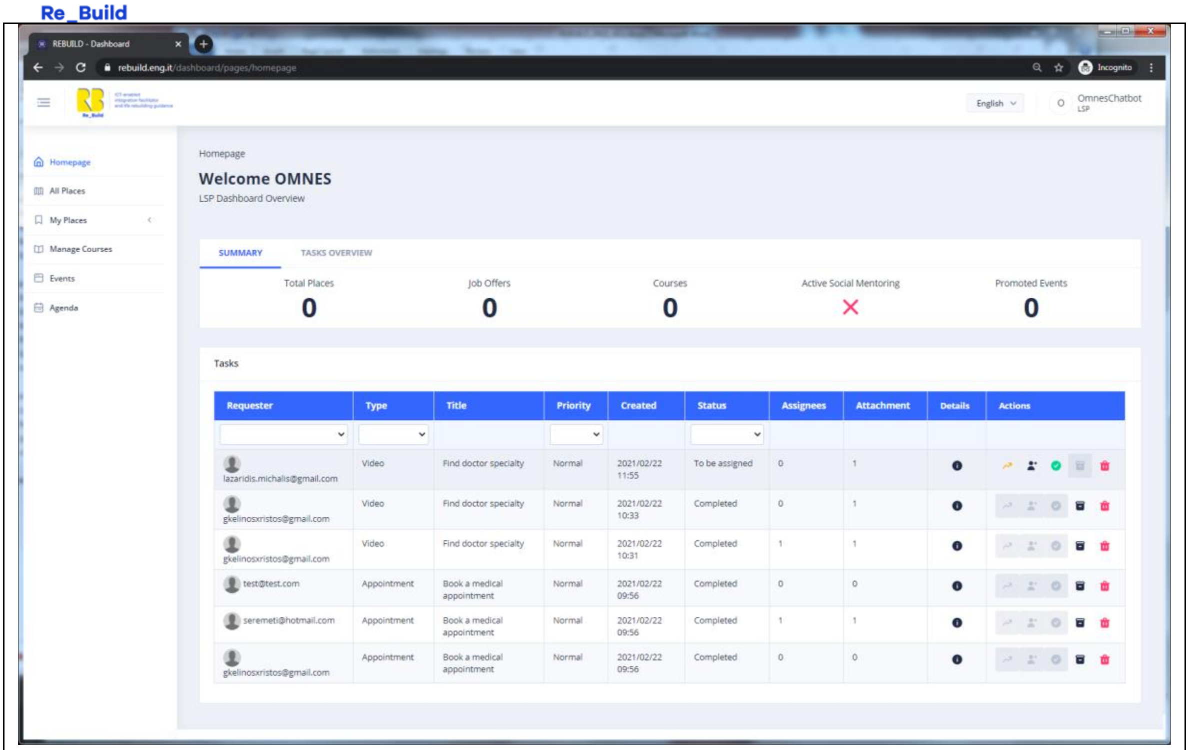
Please record a video explaining what your medical problem is. You can also request an appointment to be made at a hospital or private doctor and a translator to be present during this appointment.

less than a minute ago

less than a minute ago

Your video has been forwarded to a live representative.

Digital Companion: The user records a video describing her request in her own language. The request is forwarded to a human operator.



Homepage

Welcome OMNES

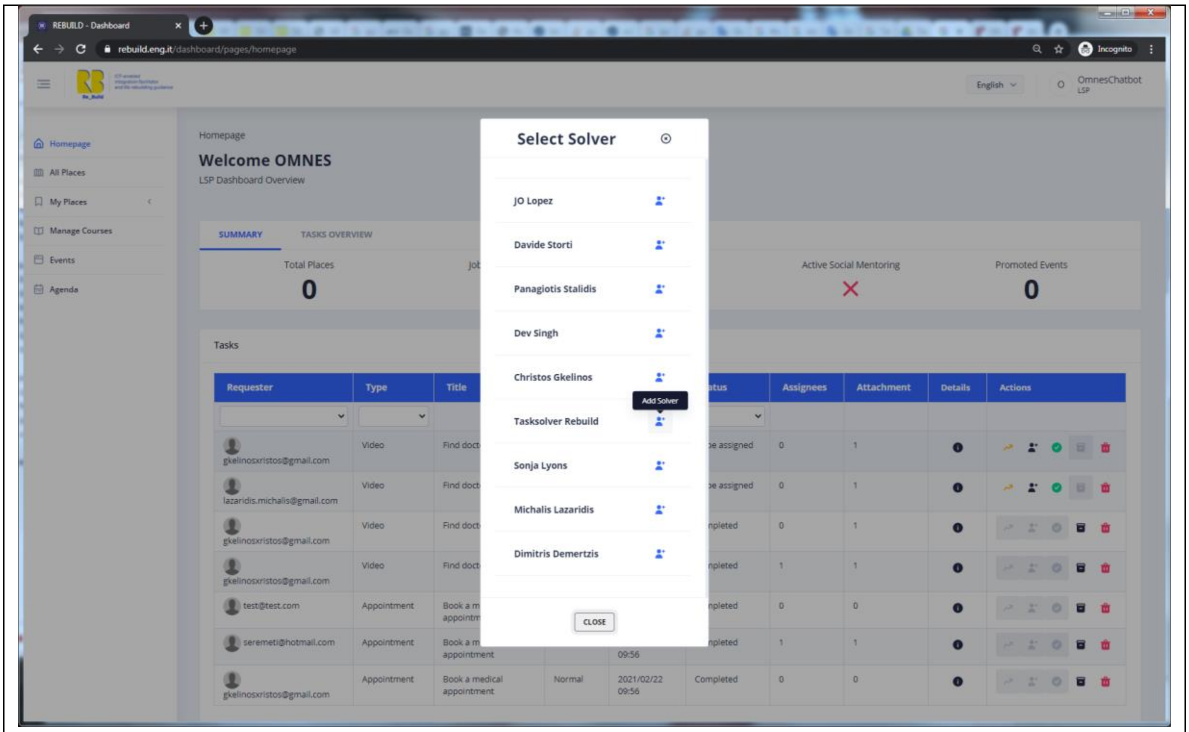
LSP Dashboard Overview

| Total Places | Job Offers | Courses | Active Social Mentoring | Promoted Events |
|---|---|---|---|---|
| 0 | 0 | 0 | ✗ | 0 |

Tasks

| Requester | Type | Title | Priority | Created | Status | Assignees | Attachment | Details | Actions |
|---|---|---|---|---|---|---|---|---|---|
| lazaridis.michalis@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 11:55 | To be assigned | 0 | 1 | ● | |
| gkelinosxristos@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 10:33 | Completed | 0 | 1 | ● | |
| gkelinosxristos@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 10:31 | Completed | 1 | 1 | ● | |
| test@test.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 0 | 0 | ● | |
| seremeti@hotmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 1 | 1 | ● | |
| gkelinosxristos@gmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 0 | 0 | ● | |

Dashboard: The operator is notified about the incoming request.



Homepage

Welcome OMNES

LSP Dashboard Overview

Select Solver

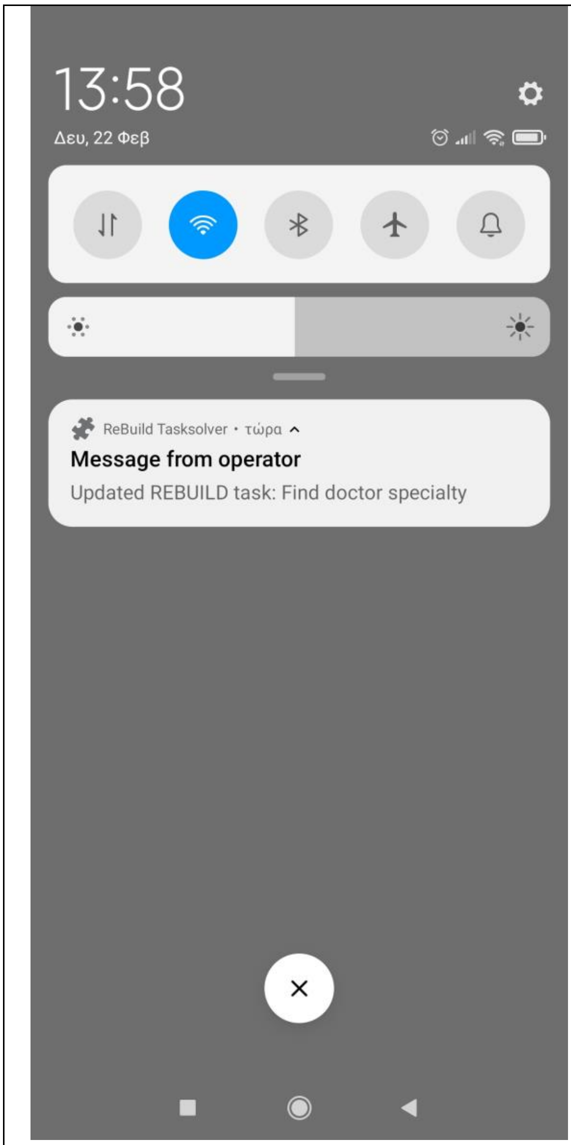
- JO Lopez
- Davide Storti
- Panagiotis Stalidis
- Dev Singh
- Christos Gkelinos
- Tasksolver Rebuild
- Sonja Lyons
- Michalis Lazaridis
- Dimitris Demertzis

| Total Places | Job | Active Social Mentoring | Promoted Events |
|---|---|---|---|
| 0 | | ✗ | 0 |

Tasks

| Requester | Type | Title | | | atus | Assignees | Attachment | Details | Actions |
|---|---|---|---|---|---|---|---|---|---|
| gkelinosxristos@gmail.com | Video | Find doct | | | e assigned | 0 | 1 | ● | |
| lazaridis.michalis@gmail.com | Video | Find doct | | | e assigned | 0 | 1 | ● | |
| gkelinosxristos@gmail.com | Video | Find doct | | | npleted | 0 | 1 | ● | |
| gkelinosxristos@gmail.com | Video | Find doct | | | npleted | 1 | 1 | ● | |
| test@test.com | Appointment | Book a m appointm | | | npleted | 0 | 0 | ● | |
| seremeti@hotmail.com | Appointment | Book a m appointment | | 09:56 | npleted | 1 | 1 | ● | |
| gkelinosxristos@gmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 0 | 0 | ● | |

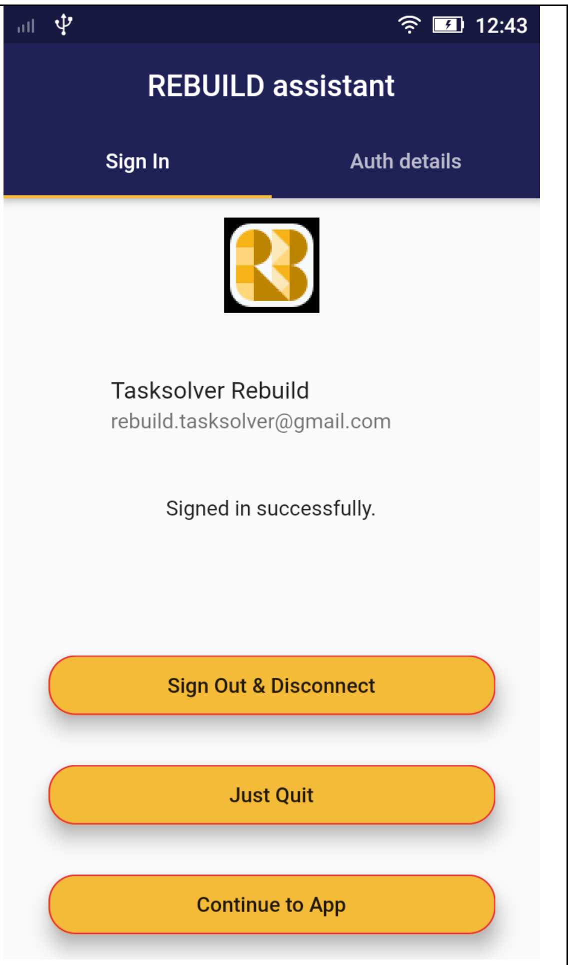
Dashboard: He inspects it and assigns a task solver to it.



ReBuild Tasksolver • τώρα

Message from operator

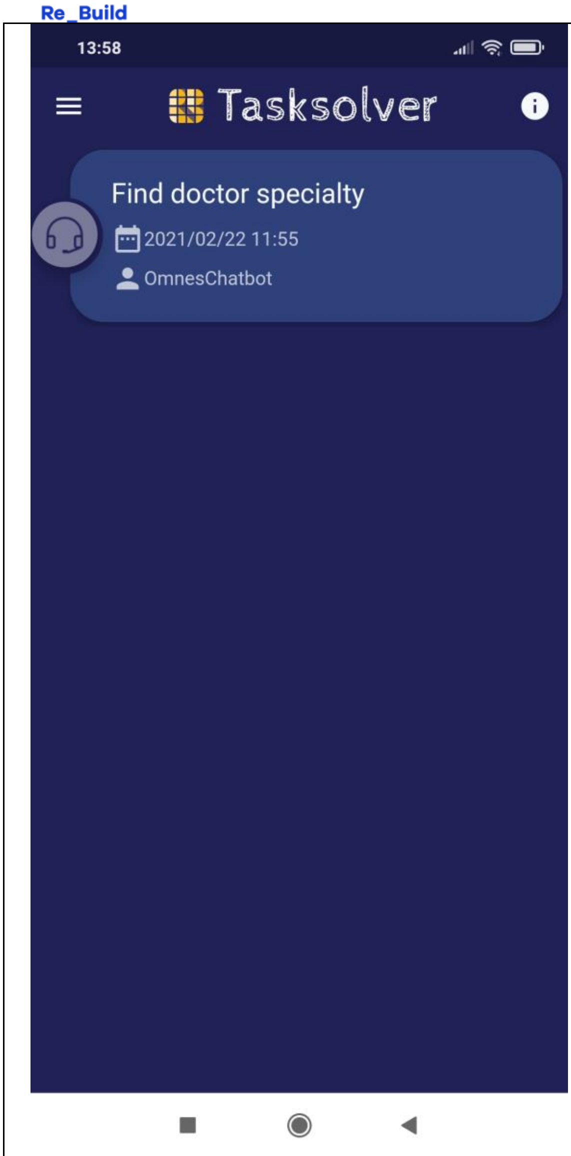
Updated REBUILD task: Find doctor specialty



Tasksolver Rebuild
rebuild.tasksolver@gmail.com

Signed in successfully.

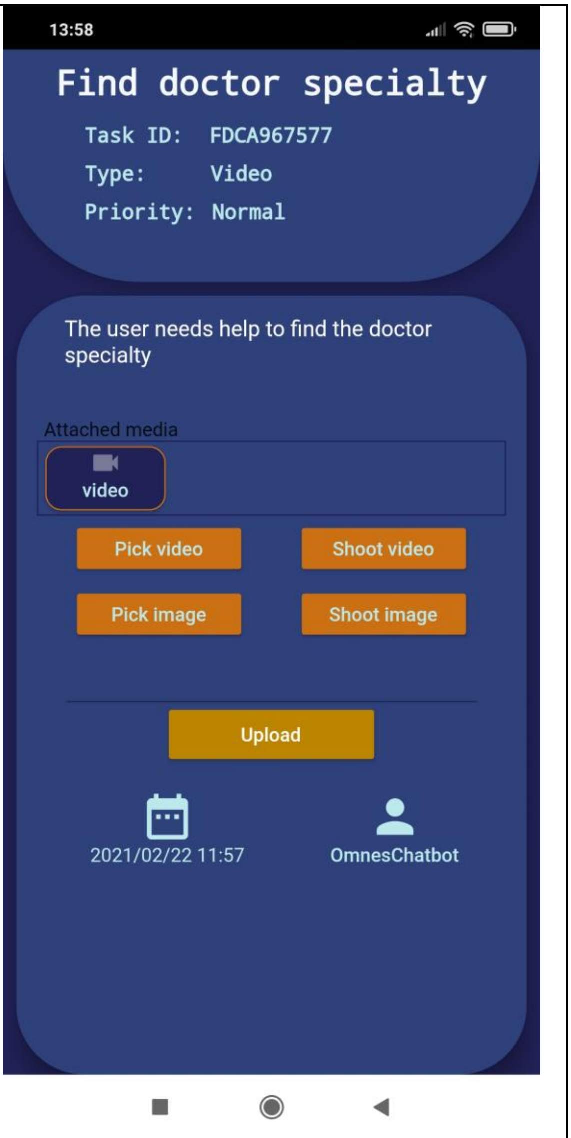
Task solver app: The translator is notified on the arrival of a new task and signs in into the task solver app.



13:58

Tasksolver

Find doctor specialty
2021/02/22 11:55
OmnesChatbot



13:58

Find doctor specialty

```
Task ID:   FDCA967577
Type:      Video
Priority:  Normal
```

The user needs help to find the doctor specialty

Attached media

video

Pick video | Shoot video

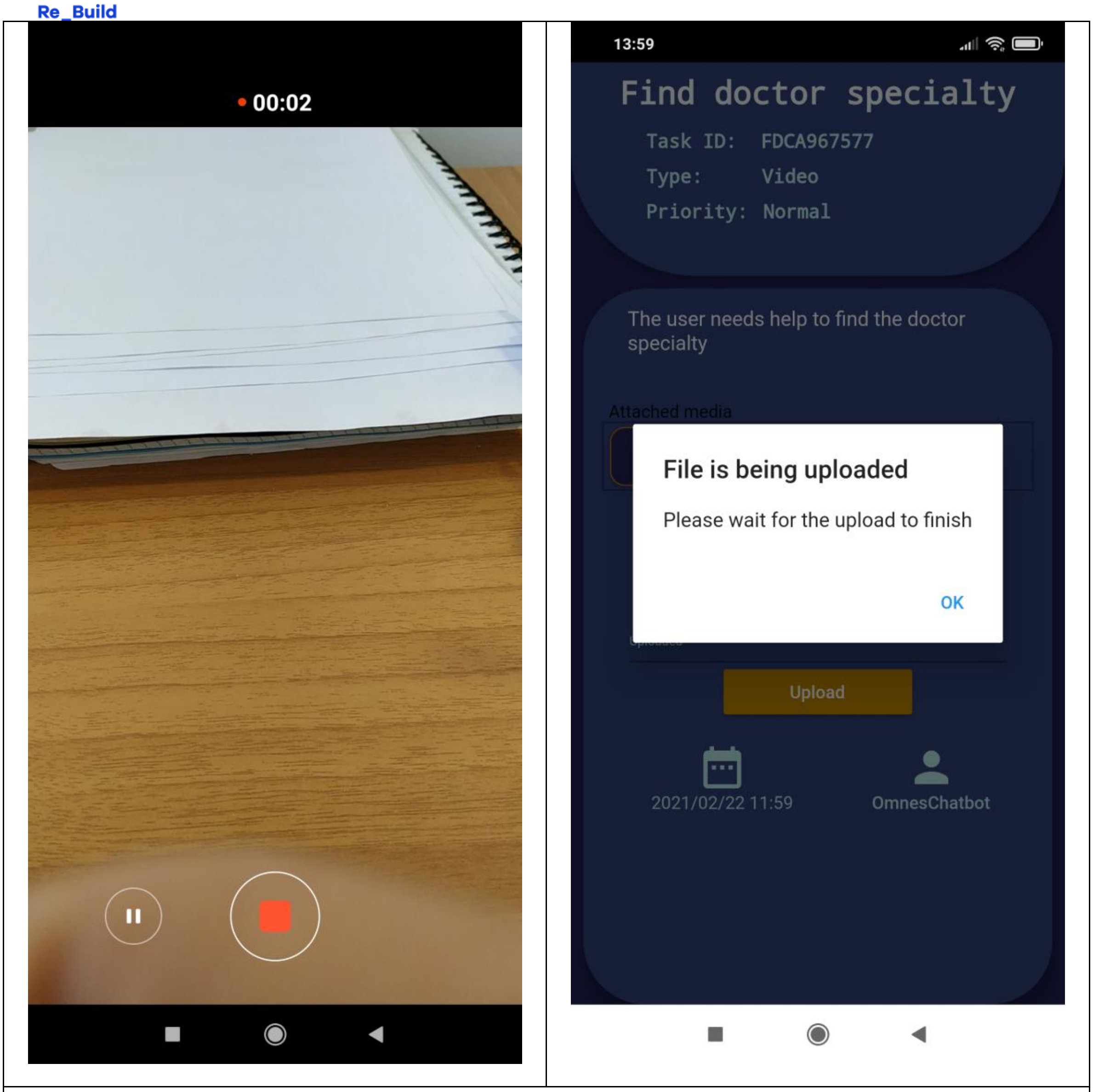
Pick image | Shoot image

Upload

2021/02/22 11:57

OmnesChatbot

Task solver app: The translator receives a list of the unsolved tasks assigned to him. He opens the task details and watches the video recorded by the immigrant.



13:59

Find doctor specialty

Task ID: FDCA967577
Type: Video
Priority: Normal

The user needs help to find the doctor specialty

Attached media

File is being uploaded

Please wait for the upload to finish

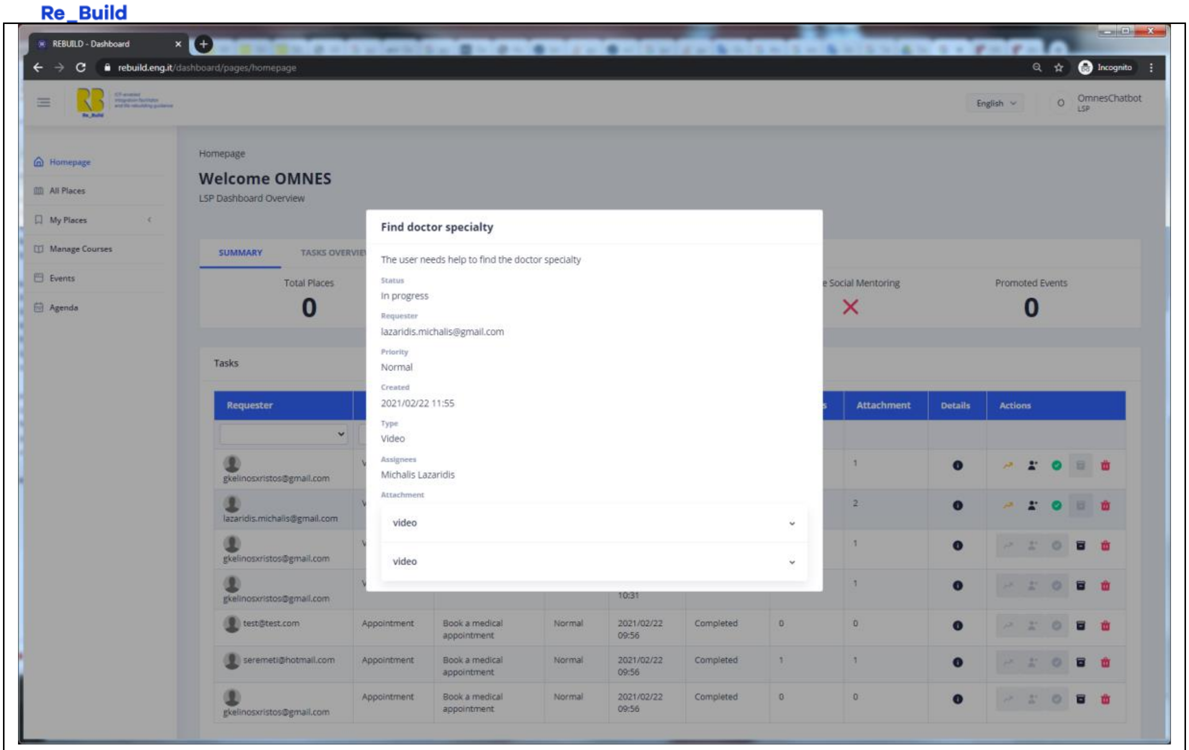
OK

Upload

2021/02/22 11:59

OmnesChatbot

Task solver app: The translator records a video responding to the immigrant's request and uploads it.



Homepage

Welcome OMNES

LSP Dashboard Overview

Total Places 0

Social Mentoring ✗

Promoted Events 0

Tasks

**Find doctor specialty**

The user needs help to find the doctor specialty

Status
In progress

Requester
lazaridis.michalis@gmail.com

Priority
Normal

Created
2021/02/22 11:55

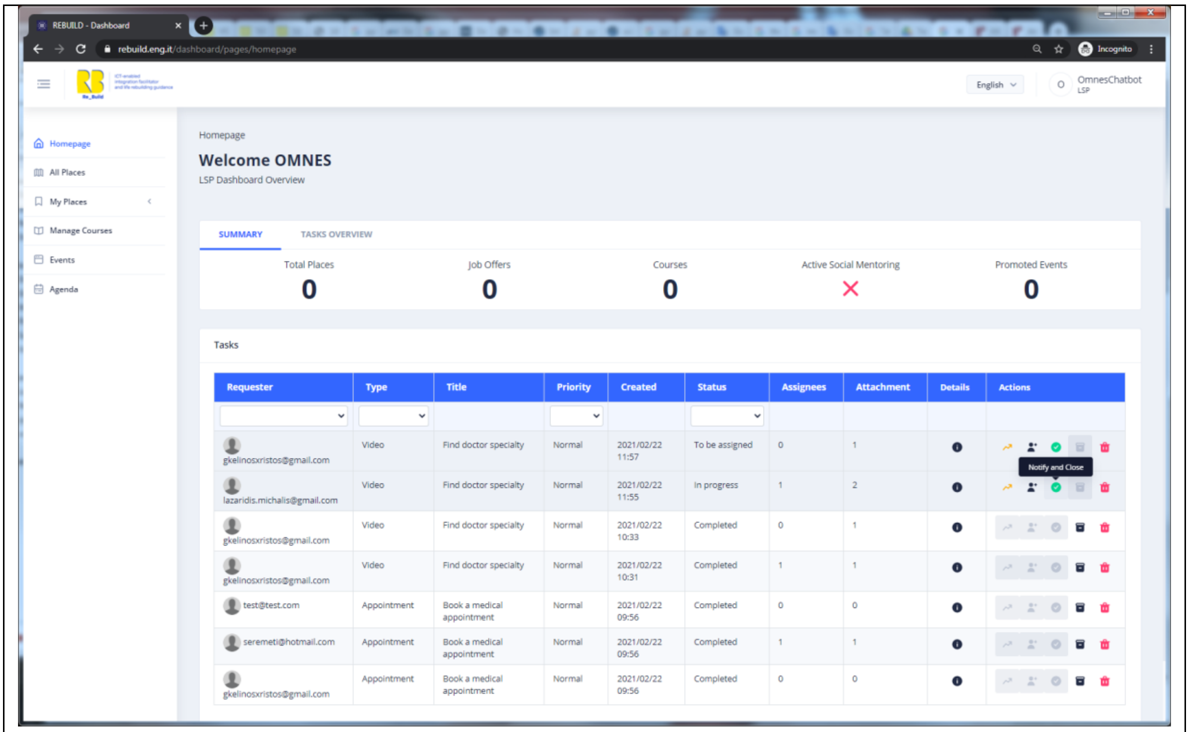
Type
Video

Assignees
Michalis Lazaridis

Attachment
video
video

| Requester | | | | | | | Attachment | Details | Actions |
|---|---|---|---|---|---|---|---|---|---|
| gkelinosxristos@gmail.com | | | | | | | 1 | ● | |
| lazaridis.michalis@gmail.com | | | | | | | 2 | ● | |
| gkelinosxristos@gmail.com | | | | | | | 1 | ● | |
| gkelinosxristos@gmail.com | | | | 10:31 | | | 1 | ● | |
| test@test.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 0 | 0 | ● | |
| seremeti@hotmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 1 | 1 | ● | |
| gkelinosxristos@gmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 0 | 0 | ● | |

Dashboard: The operator inspects the tasksolver's solution.



Homepage

Welcome OMNES

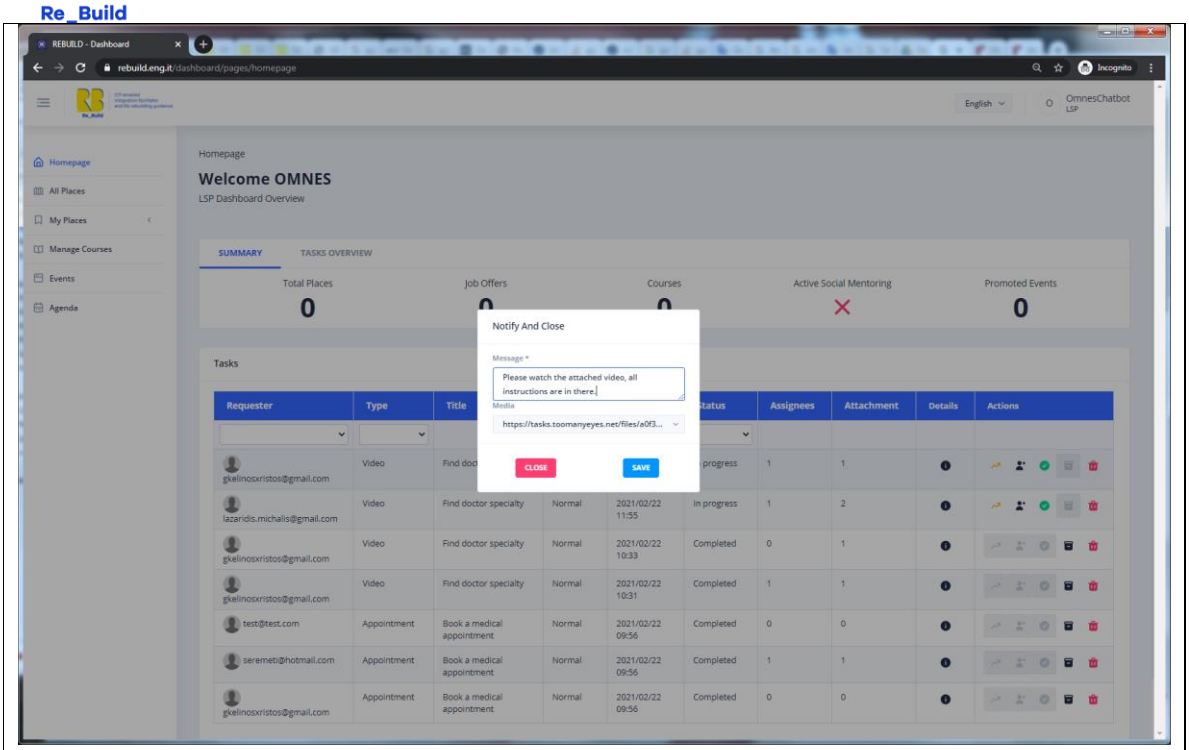
LSP Dashboard Overview

| Total Places | Job Offers | Courses | Active Social Mentoring | Promoted Events |
|---|---|---|---|---|
| 0 | 0 | 0 | ✗ | 0 |

Tasks

| Requester | Type | Title | Priority | Created | Status | Assignees | Attachment | Details | Actions |
|---|---|---|---|---|---|---|---|---|---|
| gkelinosxristos@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 11:57 | To be assigned | 0 | 1 | ● | |
| lazaridis.michalis@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 11:55 | In progress | 1 | 2 | ● | |
| gkelinosxristos@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 10:33 | Completed | 0 | 1 | ● | |
| gkelinosxristos@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 10:31 | Completed | 1 | 1 | ● | |
| test@test.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 0 | 0 | ● | |
| seremeti@hotmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 1 | 1 | ● | |
| gkelinosxristos@gmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 0 | 0 | ● | |

Dashboard: The operator decides to send the solution to the immigrant.



REBUILD - Dashboard

rebuild.eng.it/dashboard/pages/homepage

Homepage

Welcome OMNES

LSP Dashboard Overview

| Total Places | Job Offers | Courses | Active Social Mentoring | Promoted Events |
|---|---|---|---|---|
| 0 | 0 | 0 | ✗ | 0 |

Notify And Close

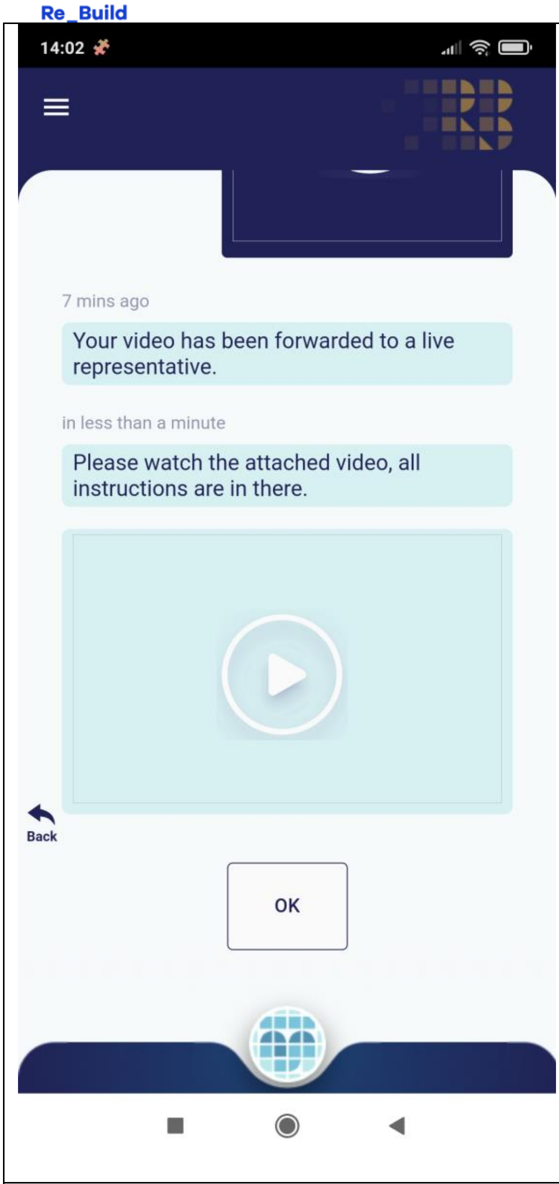
Message *: Please watch the attached video, all instructions are in there.

Media: https://tasks.toomanyeyes.net/files/a0f3...

Tasks

| Requester | Type | Title | | | tatus | Assignees | Attachment | Details | Actions |
|---|---|---|---|---|---|---|---|---|---|
| gkelinosxristos@gmail.com | Video | Find doc | | | progress | 1 | 1 | ● | |
| lazaridis.michalis@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 11:55 | In progress | 1 | 2 | ● | |
| gkelinosxristos@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 10:33 | Completed | 0 | 1 | ● | |
| gkelinosxristos@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 10:31 | Completed | 1 | 1 | ● | |
| test@test.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 0 | 0 | ● | |
| seremeti@hotmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 1 | 1 | ● | |
| gkelinosxristos@gmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 0 | 0 | ● | |

Dashboard: The operator writes a brief answer, attaches the video solution, sends the response to the immigrant and closes the task.



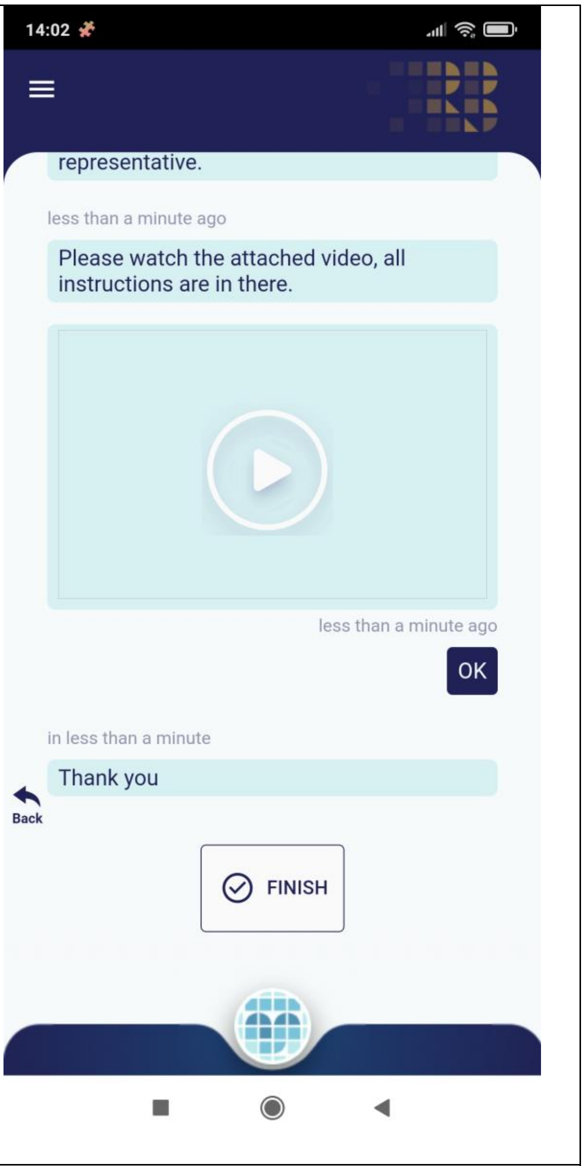
14:02

7 mins ago

Your video has been forwarded to a live representative.

in less than a minute

Please watch the attached video, all instructions are in there.



14:02

representative.

less than a minute ago

Please watch the attached video, all instructions are in there.

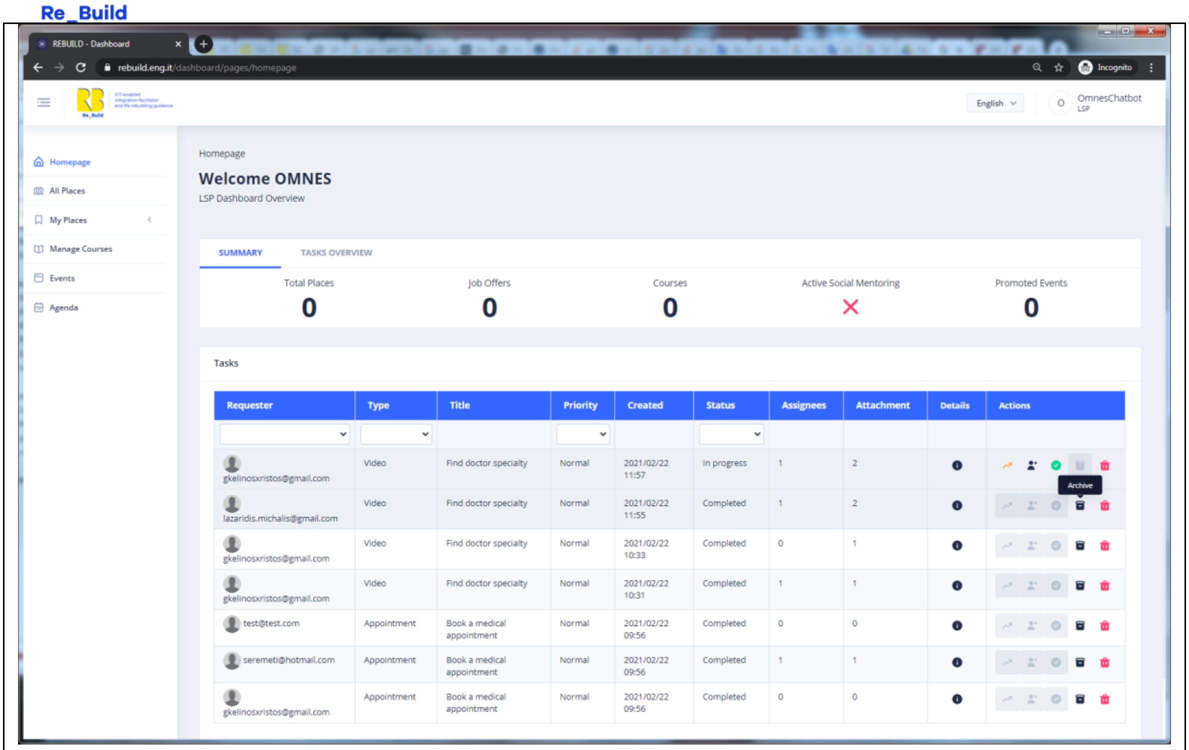
less than a minute ago

OK

in less than a minute

Thank you

Digital Companion: The immigrant receives the response and inspects the attached media. The conversation ends.



Homepage

Welcome OMNES

LSP Dashboard Overview

| Total Places | Job Offers | Courses | Active Social Mentoring | Promoted Events |
|---|---|---|---|---|
| 0 | 0 | 0 | ✗ | 0 |

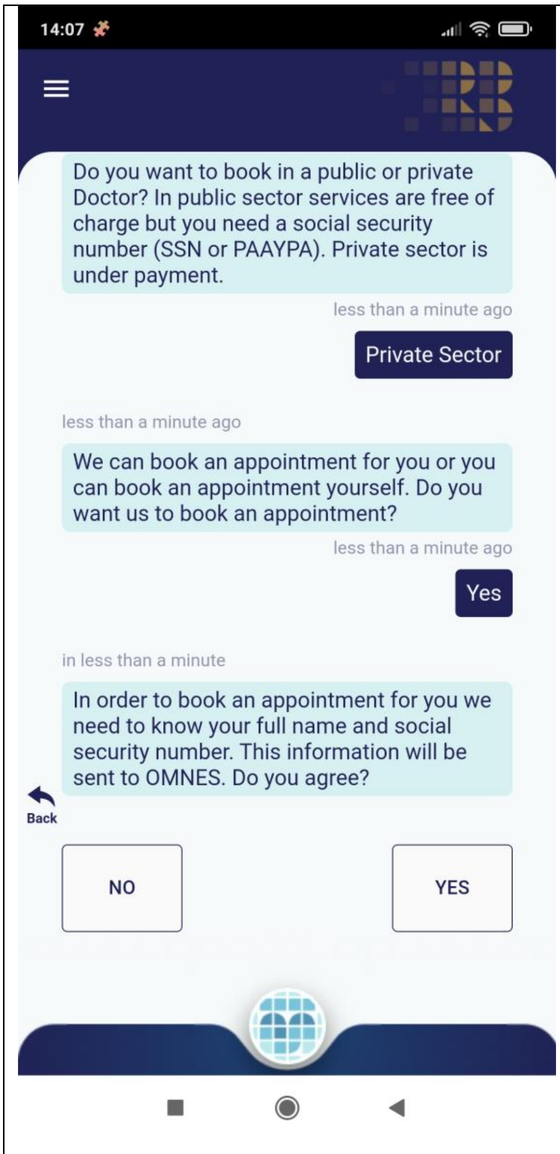
Tasks

| Requester | Type | Title | Priority | Created | Status | Assignees | Attachment | Details | Actions |
|---|---|---|---|---|---|---|---|---|---|
| gkelinosxristos@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 11:57 | In progress | 1 | 2 | ● | |
| lazaridis.michalis@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 11:55 | Completed | 1 | 2 | ● | |
| gkelinosxristos@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 10:33 | Completed | 0 | 1 | ● | |
| gkelinosxristos@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 10:31 | Completed | 1 | 1 | ● | |
| test@test.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 0 | 0 | ● | |
| seremeti@hotmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 1 | 1 | ● | |
| gkelinosxristos@gmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 0 | 0 | ● | |

Dashboard: The operator can archive the task.

## 3.3 Appointment Task Type

The Digital Companion offers the immigrant to book an appointment for him/her.



Do you want to book in a public or private Doctor? In public sector services are free of charge but you need a social security number (SSN or PAAYPA). Private sector is under payment.

less than a minute ago

Private Sector

less than a minute ago

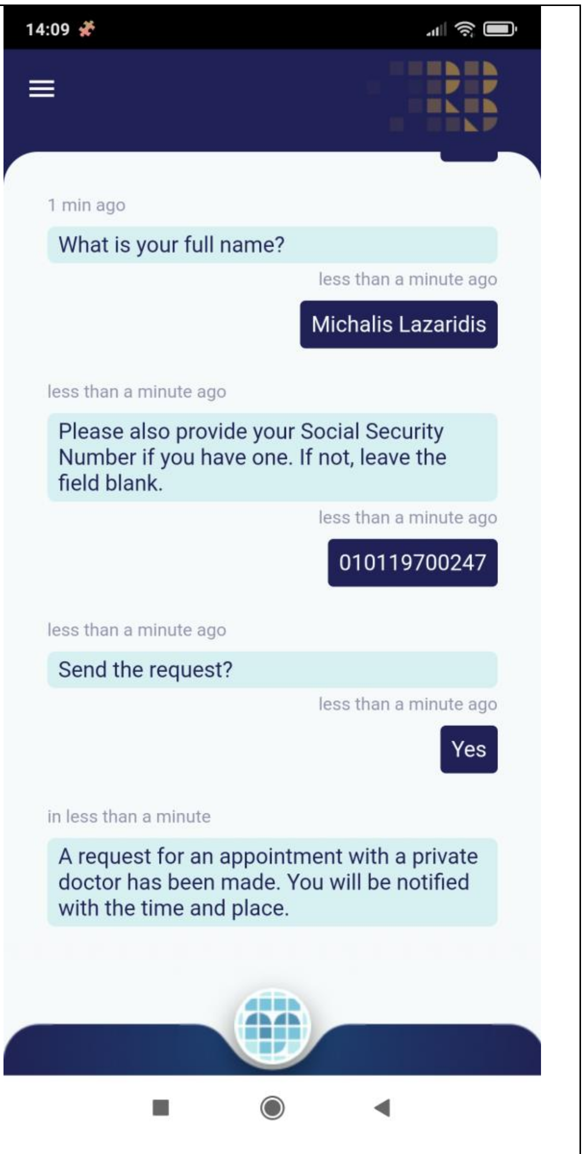
We can book an appointment for you or you can book an appointment yourself. Do you want us to book an appointment?

less than a minute ago

Yes

in less than a minute

In order to book an appointment for you we need to know your full name and social security number. This information will be sent to OMNES. Do you agree?



1 min ago

What is your full name?

less than a minute ago

Michalis Lazaridis

less than a minute ago

Please also provide your Social Security Number if you have one. If not, leave the field blank.

less than a minute ago

010119700247

less than a minute ago

Send the request?

less than a minute ago

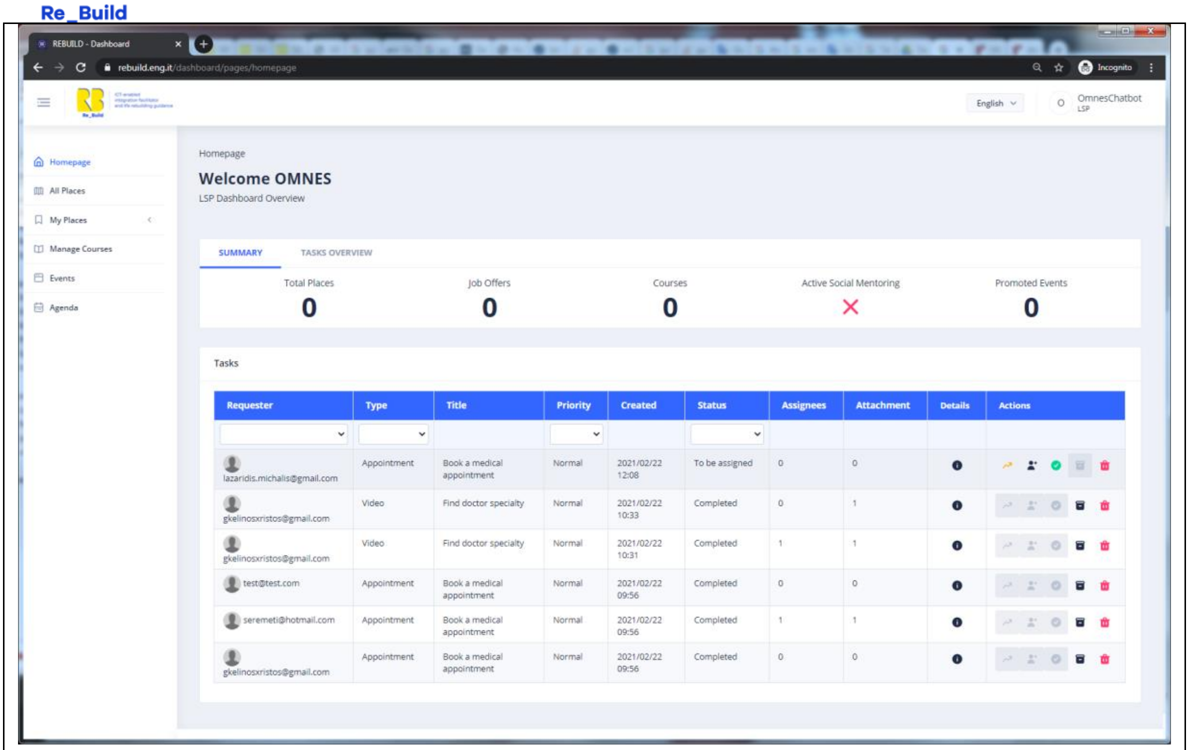
Yes

in less than a minute

A request for an appointment with a private doctor has been made. You will be notified with the time and place.

Digital Companion: The consensus of the immigrant is necessary in order to transfer personal information, necessary for booking the appointment, to the operator.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 822215



Homepage

Welcome OMNES

LSP Dashboard Overview

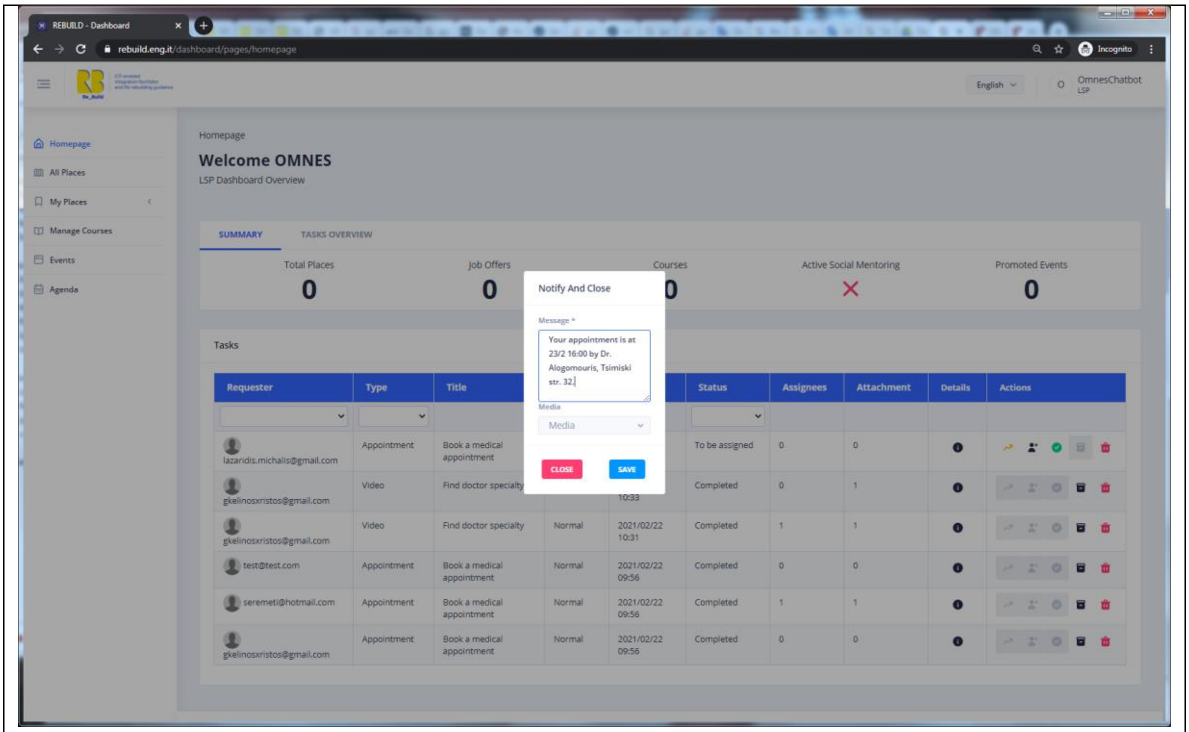
SUMMARY TASKS OVERVIEW

| Total Places | Job Offers | Courses | Active Social Mentoring | Promoted Events |
|---|---|---|---|---|
| 0 | 0 | 0 | ✗ | 0 |

Tasks

| Requester | Type | Title | Priority | Created | Status | Assignees | Attachment | Details | Actions |
|---|---|---|---|---|---|---|---|---|---|
| lazaridis.michalis@gmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 12:08 | To be assigned | 0 | 0 | ● | |
| gkelinosxristos@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 10:33 | Completed | 0 | 1 | ● | |
| gkelinosxristos@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 10:31 | Completed | 1 | 1 | ● | |
| test@test.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 0 | 0 | ● | |
| seremeti@hotmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 1 | 1 | ● | |
| gkelinosxristos@gmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 0 | 0 | ● | |

Dashboard: The operator receives the new task.



Homepage

Welcome OMNES

LSP Dashboard Overview

SUMMARY TASKS OVERVIEW

| Total Places | Job Offers | Courses | Active Social Mentoring | Promoted Events |
|---|---|---|---|---|
| 0 | 0 | 0 | ✗ | 0 |

Notify And Close

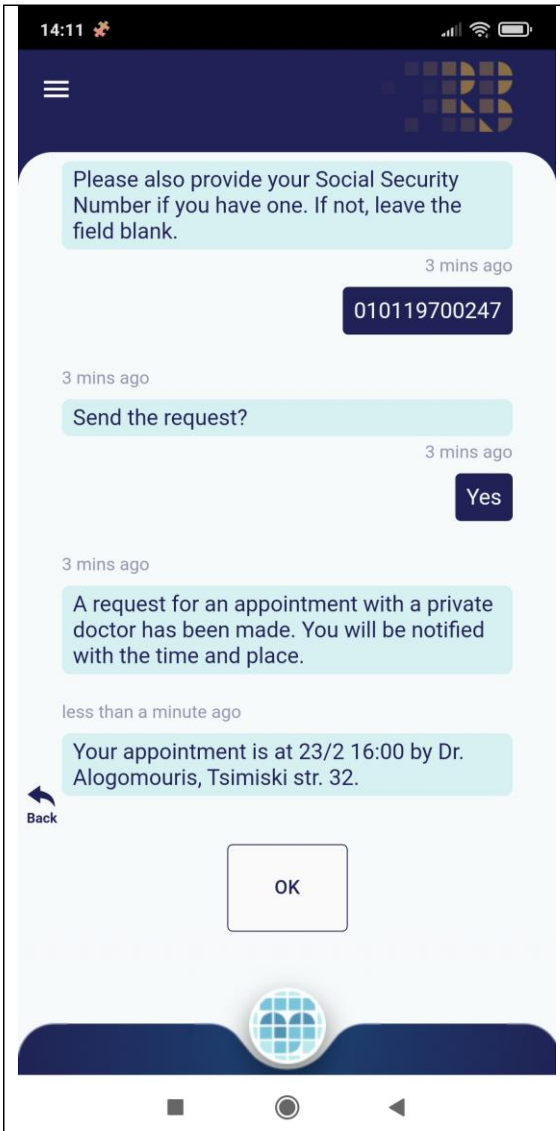
Message *: Your appointment is at 23/2 16:00 by Dr. Alogomouris, Tsimiski str. 32.

Media: Media

Tasks

| Requester | Type | Title | | | Status | Assignees | Attachment | Details | Actions |
|---|---|---|---|---|---|---|---|---|---|
| lazaridis.michalis@gmail.com | Appointment | Book a medical appointment | | | To be assigned | 0 | 0 | ● | |
| gkelinosxristos@gmail.com | Video | Find doctor specialty | | 10:33 | Completed | 0 | 1 | ● | |
| gkelinosxristos@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 10:31 | Completed | 1 | 1 | ● | |
| test@test.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 0 | 0 | ● | |
| seremeti@hotmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 1 | 1 | ● | |
| gkelinosxristos@gmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 0 | 0 | ● | |

Dashboard: The operator books the appointment, answers to the immigrant and closes the task. No need for a translator in this situation.



Please also provide your Social Security Number if you have one. If not, leave the field blank.

3 mins ago

010119700247

3 mins ago

Send the request?

3 mins ago

Yes

3 mins ago

A request for an appointment with a private doctor has been made. You will be notified with the time and place.

less than a minute ago

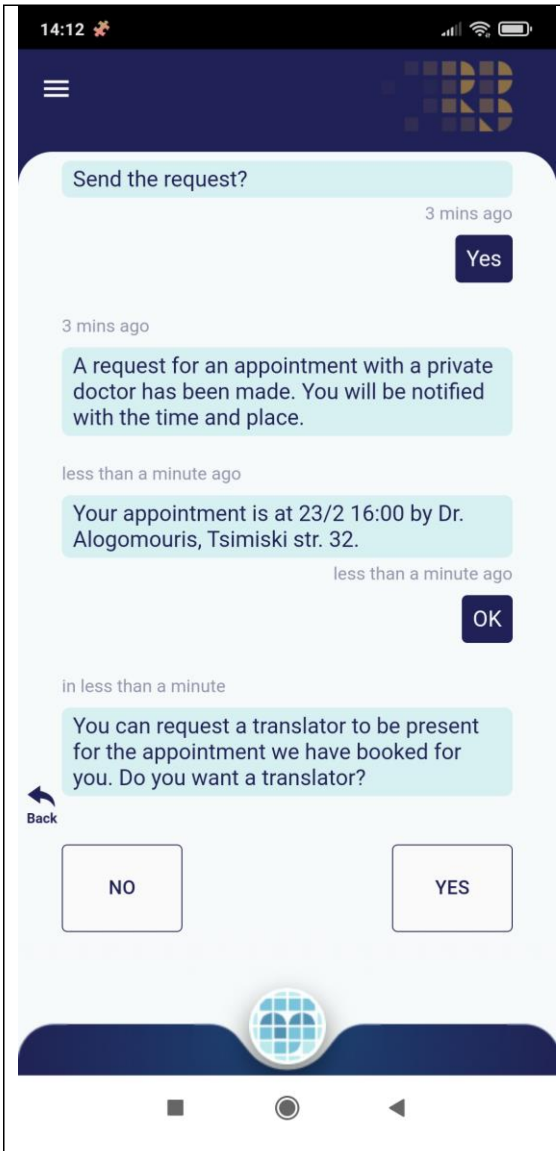
Your appointment is at 23/2 16:00 by Dr. Alogomouris, Tsimiski str. 32.

Digital Companion: The immigrant receives the appointment details and the conversation continues.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 822215

## 3.4 Translator Task Type

At this point the immigrant has an appointment with a doctor of the public or private sector.



14:12

Send the request?

3 mins ago

Yes

3 mins ago

A request for an appointment with a private doctor has been made. You will be notified with the time and place.

less than a minute ago

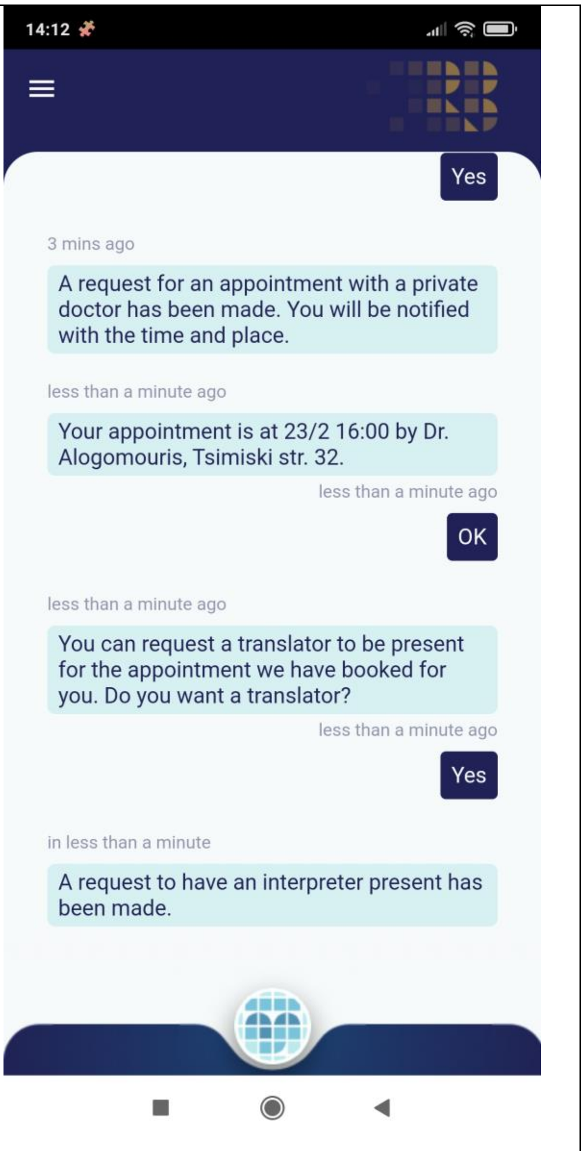
Your appointment is at 23/2 16:00 by Dr. Alogomouris, Tsimiski str. 32.

less than a minute ago

OK

in less than a minute

You can request a translator to be present for the appointment we have booked for you. Do you want a translator?



14:12

Yes

3 mins ago

A request for an appointment with a private doctor has been made. You will be notified with the time and place.

less than a minute ago

Your appointment is at 23/2 16:00 by Dr. Alogomouris, Tsimiski str. 32.

less than a minute ago

OK

less than a minute ago

You can request a translator to be present for the appointment we have booked for you. Do you want a translator?

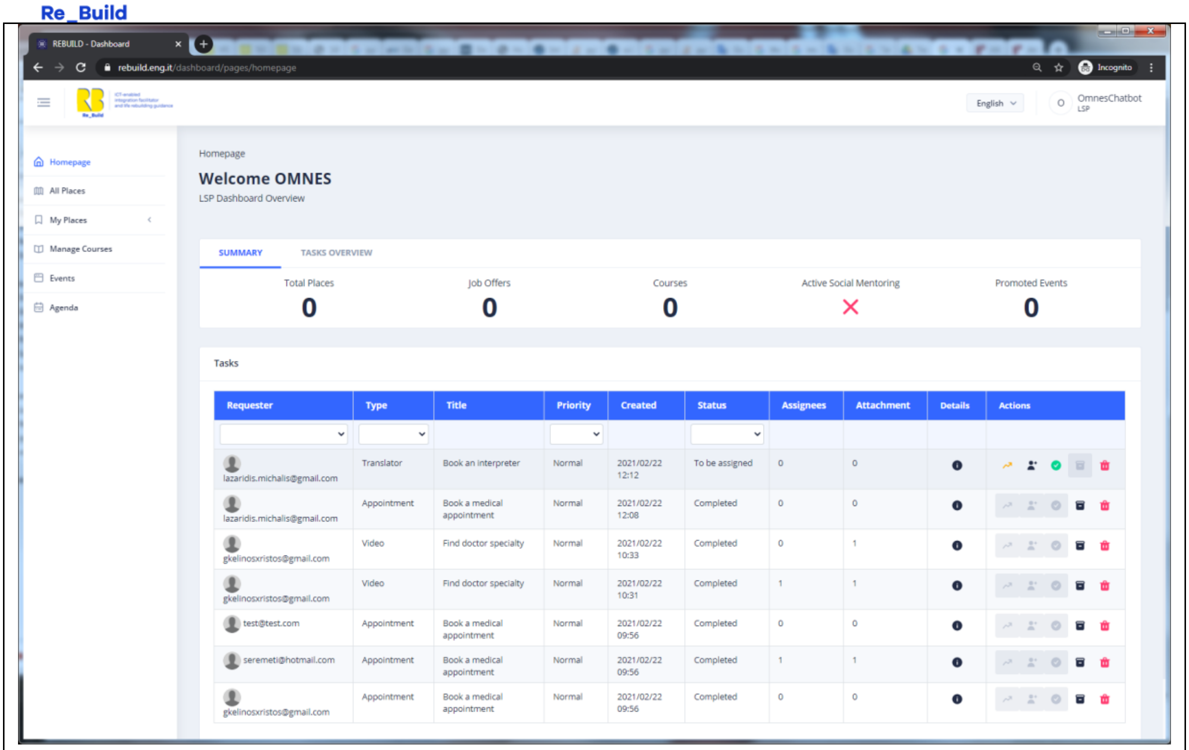
less than a minute ago

Yes

in less than a minute

A request to have an interpreter present has been made.

Digital Companion: The immigrant can request a translator to be present during the appointment.



Homepage

Welcome OMNES

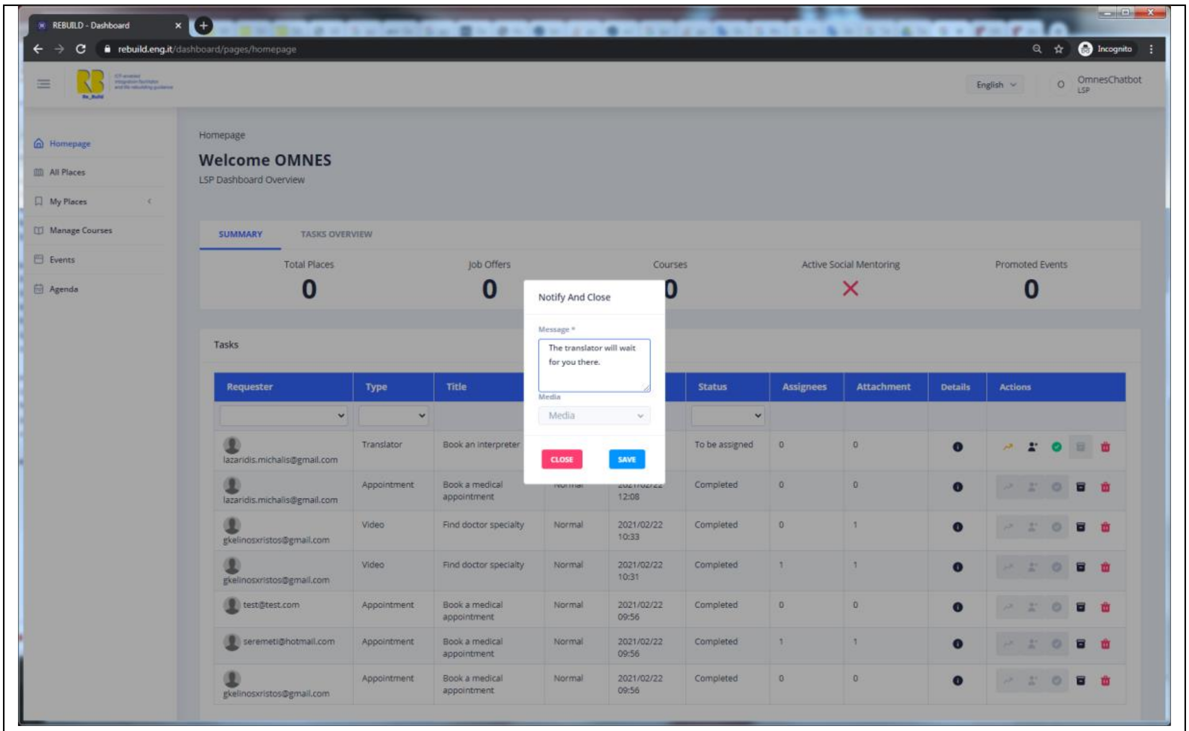
LSP Dashboard Overview

| Total Places | Job Offers | Courses | Active Social Mentoring | Promoted Events |
|---|---|---|---|---|
| 0 | 0 | 0 | ✗ | 0 |

Tasks

| Requester | Type | Title | Priority | Created | Status | Assignees | Attachment | Details | Actions |
|---|---|---|---|---|---|---|---|---|---|
| lazaridis.michalis@gmail.com | Translator | Book an interpreter | Normal | 2021/02/22 12:12 | To be assigned | 0 | 0 | ● | |
| lazaridis.michalis@gmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 12:08 | Completed | 0 | 0 | ● | |
| gkelinosxristos@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 10:33 | Completed | 0 | 1 | ● | |
| gkelinosxristos@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 10:31 | Completed | 1 | 1 | ● | |
| test@test.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 0 | 0 | ● | |
| seremeti@hotmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 1 | 1 | ● | |
| gkelinosxristos@gmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 0 | 0 | ● | |

Dashboard: The operator receives the new task. In this situation, he can contact the translator through the task solver app or directly through phone.



Homepage

Welcome OMNES

LSP Dashboard Overview

| Total Places | Job Offers | Courses | Active Social Mentoring | Promoted Events |
|---|---|---|---|---|
| 0 | 0 | 0 | ✗ | 0 |

Notify And Close

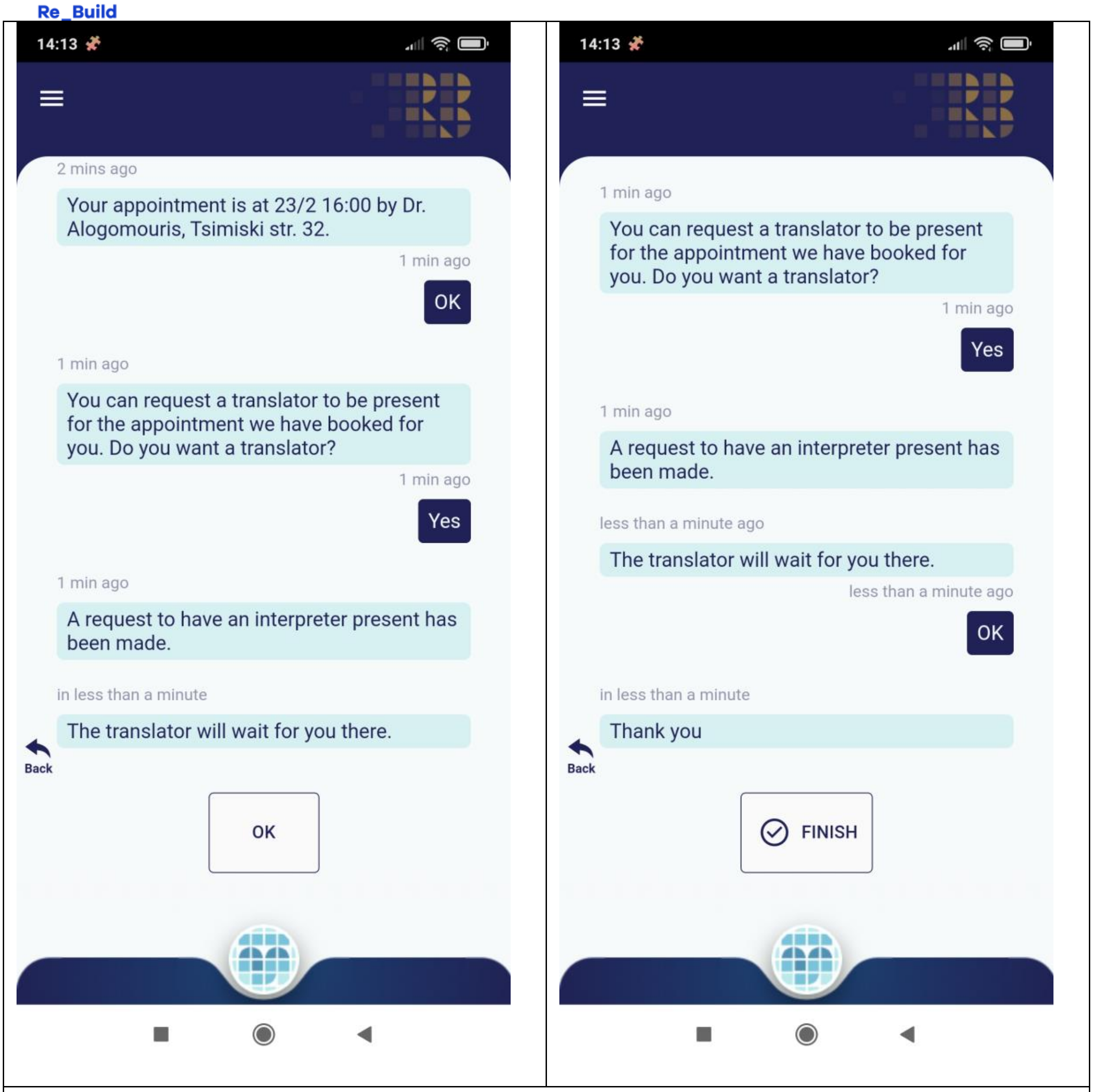
Message *: The translator will wait for you there.

Media: Media

Tasks

| Requester | Type | Title | Priority | Created | Status | Assignees | Attachment | Details | Actions |
|---|---|---|---|---|---|---|---|---|---|
| lazaridis.michalis@gmail.com | Translator | Book an interpreter | | | To be assigned | 0 | 0 | ● | |
| lazaridis.michalis@gmail.com | Appointment | Book a medical appointment | | 12:08 | Completed | 0 | 0 | ● | |
| gkelinosxristos@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 10:33 | Completed | 0 | 1 | ● | |
| gkelinosxristos@gmail.com | Video | Find doctor specialty | Normal | 2021/02/22 10:31 | Completed | 1 | 1 | ● | |
| test@test.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 0 | 0 | ● | |
| seremeti@hotmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 1 | 1 | ● | |
| gkelinosxristos@gmail.com | Appointment | Book a medical appointment | Normal | 2021/02/22 09:56 | Completed | 0 | 0 | ● | |

Dashboard: The operator books the translator, answers to the immigrant and closes the task.



14:13

2 mins ago

Your appointment is at 23/2 16:00 by Dr. Alogomouris, Tsimiski str. 32.

1 min ago

OK

1 min ago

You can request a translator to be present for the appointment we have booked for you. Do you want a translator?

1 min ago

Yes

1 min ago

A request to have an interpreter present has been made.

in less than a minute

The translator will wait for you there.

14:13

1 min ago

You can request a translator to be present for the appointment we have booked for you. Do you want a translator?

1 min ago

Yes

1 min ago

A request to have an interpreter present has been made.

less than a minute ago

The translator will wait for you there.

less than a minute ago

OK

in less than a minute

Thank you

Digital Companion: The immigrant receives the answer and the conversation ends.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 822215

# 4 TECHNOLOGIES, TOOLS AND CONSIDERATIONS

This part of the document describes technologies and tools used for the implementation of the Task Solving framework.

## 4.1 MICROSERVICES

As seen in previous sections, the designed framework consists of several components. The chatbot, the task server (along with its GUI, database and interfaces) and the repository have their own list of system and software requirements, but should live all in the same environment. Apart from that, the framework needs to be scalable and, if decided so, to be compatible and transferable to one of the most common hosting solutions (Azure, Amazon, etc.) and operate from there as a cloud-based application. The microservices paradigm is an ideal candidate for this situation. In this aspect, **Docker**[1] has been chosen, whose open source components are generally licensed under the Apache 2.0 license.

## 4.2 TASK MANAGEMENT

The task server development is based on **Node.js**[2]. Node.js is an open-source, cross-platform, JavaScript runtime environment that executes JavaScript code outside of a browser. Node.js lets developers use JavaScript to write command line tools and for server-side scripting—running scripts server-side to produce dynamic web page content before the page is sent to the user's web browser. The design choices behind Node.js aim to optimize throughput and scalability in web applications with many input/output operations, as well as for real-time web applications. Node.js is an open-source framework under the MIT license.

## 4.3 TASK STORAGE

**MongoDB**[3] has been chosen for storing tasks and related metadata. MongoDB is an open-source NoSQL document database that provides high performance, high availability, and automatic scaling. MongoDB is licensed under GNU AGPL v3.0.

## 4.4 REPOSITORY

During the framework intermediate processing steps, binary data is produced by the tools, e.g. request videos or instructory videos. Initially there were three approaches for storing binary data: To store it in a database, to store it on the file system and to store it on an online cloud-based storage platform, like Azure or Dropbox. After studying the current and future project needs, a hybrid solution has been chosen. A local Azure instance (Azurite) has been wrapped in a service that provides tailored access to specific functionalities, like file upload, servicing and deletion. The repository can be used from all REBUILD framework components and can be transferred with minimal effort to a cloud-based Azure instance.

[1] https://www.docker.com/

[2] https://nodejs.org/

[3] https://www.mongodb.com/

## 4.5 MOBILE APP DEVELOPMENT

For the mobile client development, **Flutter**[4] has been chosen. Flutter is a free and open source Google mobile UI framework that provides a fast and expressive way for developers to build native apps on both IOS and Android. Flutter apps are written in the Dart language and make use of many of the language's more advanced features. The flutter is the only framework with mobile SDK which provides reactive styles without using any Javascript bridge. Flutter is licensed under the BSD 3-Clause license.

## 4.6 AUTHORIZATION, AUTHENTICATION, ENCRYPTION

Hijacking the phone of an immigrant (requester or translator) is not a thread to the system, since they are only clients of the framework and, moreover, their produced content is evaluated by the operator, before being forwarded through the system. The only thread to the system would be the impersonation of the operator, since the operator is the central actor of the framework with access to almost all framework components and data. This issue is handled by the main REBUILD authorization API. The Identification and Authorization in the task solver application is handled by Google Firebase.

We should keep in mind that the designed framework serves humanitarian purposes. The opportunity for villainous individuals to earn profit or perform financial fraud is minimal.

Access to sensitive data, on the other hand, is crucial for the acceptance of the framework. The immigrants will not trust the system, if they are not confident that their identity, as well as their produced content is safe from unauthorized access. For addressing this requirement, all connections between the components are HTTPS-based. All worker profile information is pseudonymized, so that only an artificial identifier is saved in the database. Additionally, all material produced by the immigrants and the translators is stored in a local repository. Finally, the option is provided to automatically delete all request videos as soon as an instructory video is available.

[4] https://flutter.dev/

# 5 REQUIREMENTS VS IMPLEMENTATION

In this chapter, the requirements set for the proposed solution in D4.2 are considered. The requirement collection was based on D2.5 [4], as well as on the feedback coming from the migrants and the local service providers during the co-creation workshops.

The main architectural requirements identified for the framework were the following:

- The framework has to include a **task management** component, where incoming requests can be converted to tasks and the tasks can be forwarded to the solving units, evaluated, updated and finally returned solved to the requester.
- The framework has to include a **mobile client**, where tasks will be solved, possibly in several iterations.
- The framework has to include a **multimedia exchange** approach that will transfer the multimodal information (text, photos, voice, video) between all relevant actors.

In the following tables, the functional and non-functional requirements are looked upon against the design decisions and implemented solutions.

| Functional Requirements | Description | Notes |
|---|---|---|
| Task management | The framework must support the creation, browsing, update, solving and deletion of tasks. | Supported |
| Support multiple user roles | Different task operations should be performed by users with different user roles, e.g. operator manages tasks, workers solve tasks. | Requesters can create tasks through the Chatbot, in the Digital Companion. Operators can create and manage tasks through the task server visual interface or the REBUILD dashboard. Workers can solve tasks through the task solver app. |
| Support multiple users | The framework must support at least 50 workers for solving tasks and 1000 requesters for posting requests. | The framework can handle as many users as supported by the overall REBUILD framework. |
| Support mobile phones | Newly created tasks must be pushed to the mobile phones of the appropriate users. Users solve tasks on their mobile phones and return the results to the task management component. | All phones running Android 4.1 (API level 16) and upwards are supported. |
| Support iterative evaluation | Multi-round evaluation of solved tasks must be possible. The operator can require the update of a task solution several times before | The basic version of the framework includes chat capabilities between the operator and the task solvers. This functionality was not integrated into the REBUILD |

| | | |
|---|---|---|
| | accepting a solution. | scenarios, since it was decided that the REBUILD dashboard should not have a chat interface. The iterative evaluation in this case is based on the update of the task description and the notification of the task solver. |
| User data management | A scheme for registering, identifying and profiling workers must be provided. For identification, IMEI or SSN can be used, apart from first and last name of the worker. | The workers are registered and identified through Google Firebase. Their profiles include their provided names, their Gmail address and a profile pic and are pseudonymized, so that only an artificial identifier is saved in the database. |
| Support exchange of multimedia | The framework must support the exchange of multimedia content, such as text, photos, voice and video, as part of the task solving procedure. Especially in the video case, at least 200MB attachments should be supported. | The chat component supports the exchange of all kind of content. Apart from that, the main application supports exchange of images and videos. Text exchange happens through the description field. The exchange file limit is set to 200MBs for security reasons. |
| Alerts/ Notifications | The framework must support notifications for all actors, e.g. when a new task has arrived. | The framework utilizes socket.io interfaces for supporting notifications for the operator and the task solvers. In case the task solving application is not in the foreground, a Google Firebase notification signals the user when a new task arrives or an existing one is updated. |

*Table 1: Functional requirements VS implementation*

| **Non-Functional Requirements** | **Description** | **Notes** |
|---|---|---|
| Security | Security requirements ensure that the software is protected from unauthorized access to the system and its stored data. It considers different levels of authorization and authentication across different user roles. All the internal elements must be hidden from external users. The only way to get data must be the public API. Sensitive data must be stored securely and users must be confident that their data will not follow paths other than the ones | Authorization of requesters is handled by the main REBUILD authorization API. Authorization of the workers is handled by the Google Firebase API. All internal elements are inside docker containers, accessible only through their APIs. No sensitive data is stored in the database, except for an artificial identifier for the pseudonymization. Binary data is stored in a local Azurite instance which can be transferred in the |

| | | |
|---|---|---|
| | described in the project's description. | future to the Microsoft Azure platform, if necessary. |
| Usability | The framework interfaces must be easy to learn and operate for all key players. Low literacy skills are expected from migrants using the framework, in terms of language, technology and local culture. If the framework is not intuitive enough, the users will lose confidence and be reluctant to use it. | The task solving application has very simple and intuitive interfaces. Since the REBUILD testing phase is not finished at the time of compiling this deliverable, further modifications on the graphical interfaces may occur, after evaluating the feedback of the testing. |
| Availability | The mobile client should be compatible at least with android devices and the appropriate installation packages should be accessible from a dedicated platform on demand. | All phones running Android 4.1 (API level 16) and upwards are supported. The installation package is accessible through Google Drive and can be transferred to the Google Play. |
| Scalability | The framework must be scalable without suffering significant performance degradation. This refers to the number of requesters as well as to the number of workers. The framework should be designed to be compatible with the most common hosting solutions (Azure, Amazon, etc.) so that a cloud installation is possible, in case that a future scale up leads to this decision. In this case, all personal data collected must be stored in an EU country, as specified in D7.4 [5]. | Authentication is based on Google Firebase. Tasks are saved in a MongoDB. Binary data is saved in a local Azurite instance, which is highly compatible with Microsoft Azure. Thus, all components are highly scalable. In case of a future scale up, only EU-based servers will be used. |
| Operational Costs | Operational costs, including renting third party software, hardware or bandwidth on a monthly/annual fee, should be minimized. Preferably only software implemented during the project or open source solutions should be used. The framework should be sustainable for a low cost after the end of the project. | The only additional cost that will occur in case of a scale up is the renting of a cloud-based service for operation and storage. |

*Table 2: Non-functional requirements VS implementation*

# 6 Conclusion and Future Ideas

In the current document we have presented the prototype of the task solving framework, whose main functionalities and interfaces have been planned and designed in D4.2. We demonstrated the use of the framework, along with its workflow, actors and modules, in one of the REBUILD scenarios, the OMNES Healthcare scenario, as it has been implemented for the testing phase of REBUILD. We briefly presented technologies and tools that have been utilized for the framework implementation. A correspondence between the functional and non-functional requirements identified in D4.2 and various implementation aspects and decisions has been provided.

We expect that the short audio-visual information exchanged through the framework will be an effective tool towards guiding illiterate people to interact with the public authorities and public or private services.

Updates on technologies and tools are expected until the end of the project, especially after the testing phase and the evaluation of the user feedback. Apart from that, several ideas are under consideration for updating the design and extending the functionalities of the task solving framework: A statistics page can be added, for monitoring the system load and the performance of the task solvers. Extra fields like task accept/deny buttons or extra modalities like audio could extend the usefulness of the application. A component for charging the requester or providing revenues to the task solver would also facilitate the transfer to other domains. A geolocation component could provide an extra filter for assigning task solvers to location dependent tasks. And finally, an automatic routing component would eliminate the operator from the equation.

# 7 REFERENCES

[1] CERTH, "D4.2 - Scripted audio/video capturing for the illiterate (Report)", REBUILD project, 2019.

[2] CERTH, "D4.4 - Designing the digital companion", REBUILD project, 2020.

[3] CERTH, "D4.8 - The digital companion prototype", REBUILD project, 2021.

[4] UNINETTUNO, "D2.5 - REBUILD service scenarios and prototypes", REBUILD project, 2020.

[5] VUB, "D7.4 - Ethical guidelines for REBUILD ICT solutions", REBUILD project, 2020.

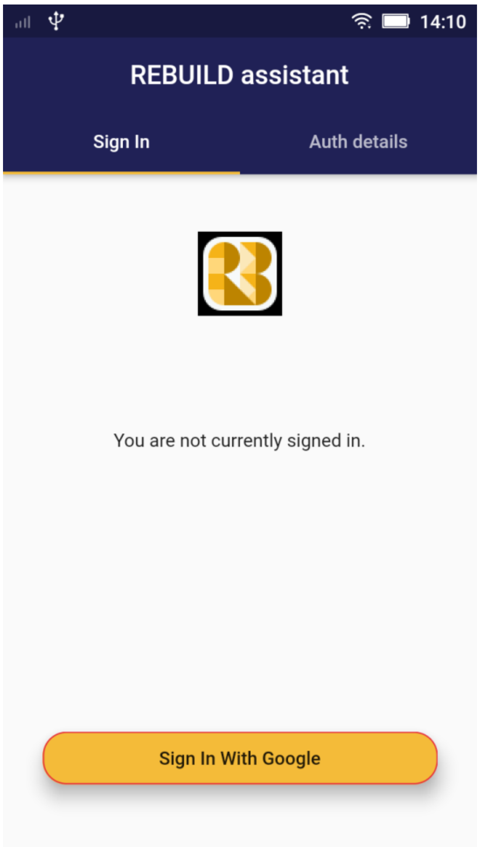
# 8 ANNEX 1 – TASK SOLVER USER MANUAL

## Technical

The TaskSolver application can be installed on Android phones. It should be compatible with Android 4.1 (API level 16) and upwards.

It has been tested on a Lenovo Vibe K5 (8 cores, 1.4GHz, 2GB RAM, 16GB device memory, Android 5.1.1, API level 22) and on a Redmi Note 6 Pro (8 cores, 1.8GHz, 4GB RAM, 64GB device memory, Android 9, API level 28).

## Manual

| | |
|---|---|
| After the installation, you have to sign in with your gmail account. The first time that you sign in, the app asks for permission to access your user account. |  14:10<br>REBUILD assistant<br>Sign In<br>Auth details<br>You are not currently signed in.<br>Sign In With Google |

After signing in, you have 3 options:

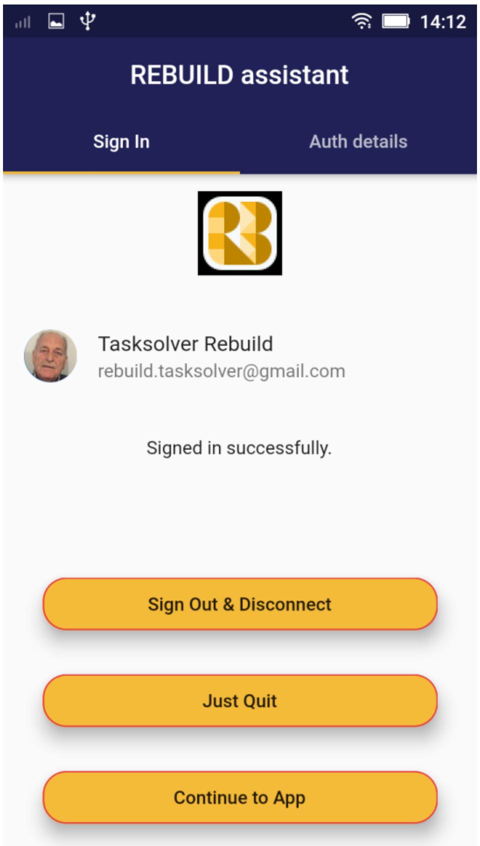
a) to sign out and close the application,

b) to just close the application and

c) to continue to the actual app

When you wish to exit the application, it is advisable to either use the Home button of the mobile phone or to return to this screen by using the Back button and tap on "Just Quit".

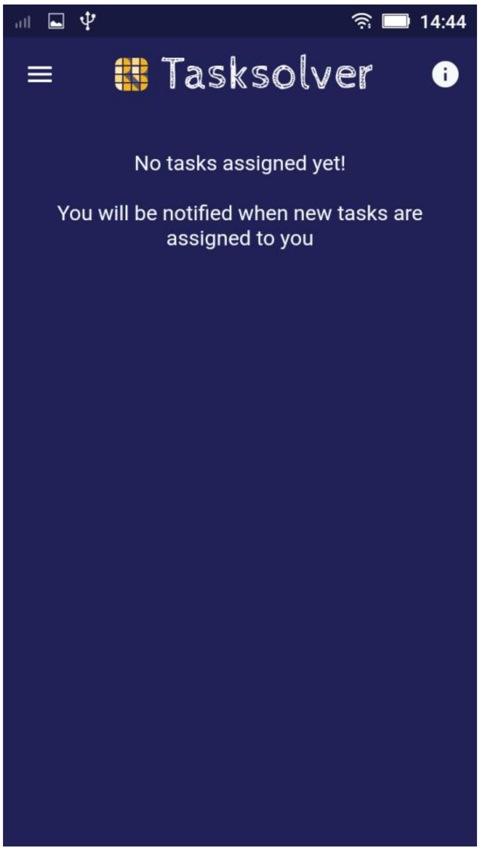
This way, you stay logged in and don't need to sign in again the next time that you open the app. Apart from that, notifications on new/updated tasks are shown only if you stay signed in.



Tasksolver Rebuild
rebuild.tasksolver@gmail.com

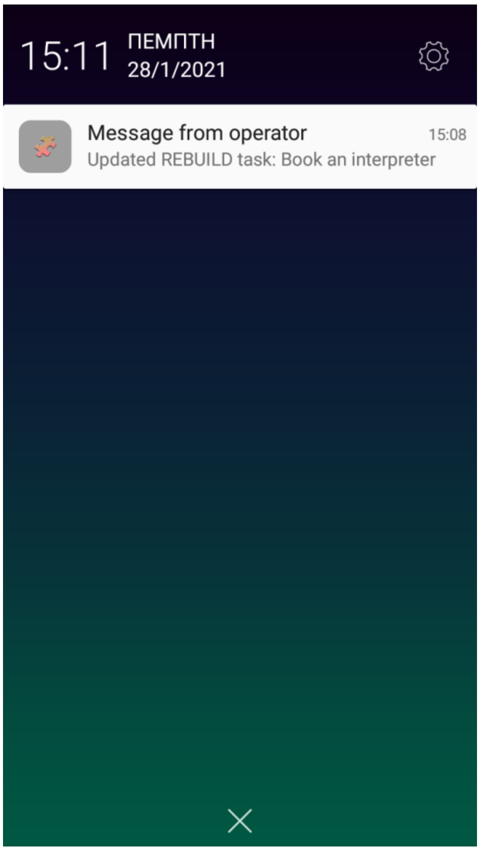
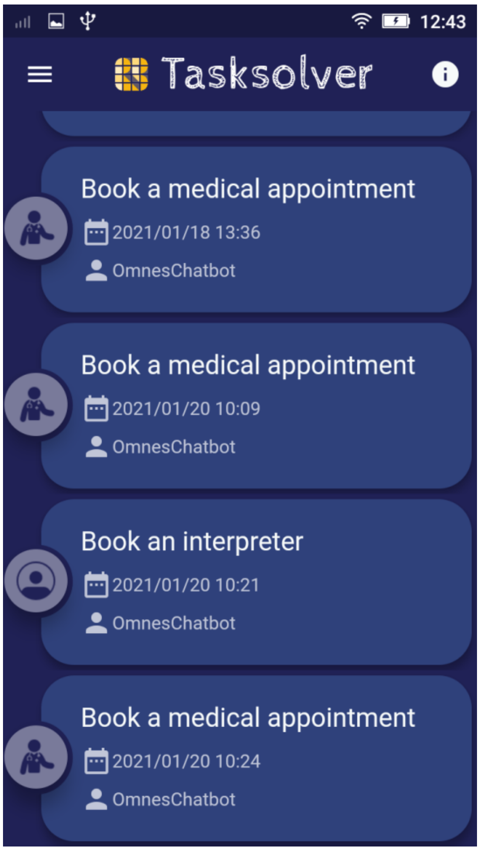
Signed in successfully.

This is the task list. The first time that you enter the application, no tasks are assigned to you.



No tasks assigned yet!

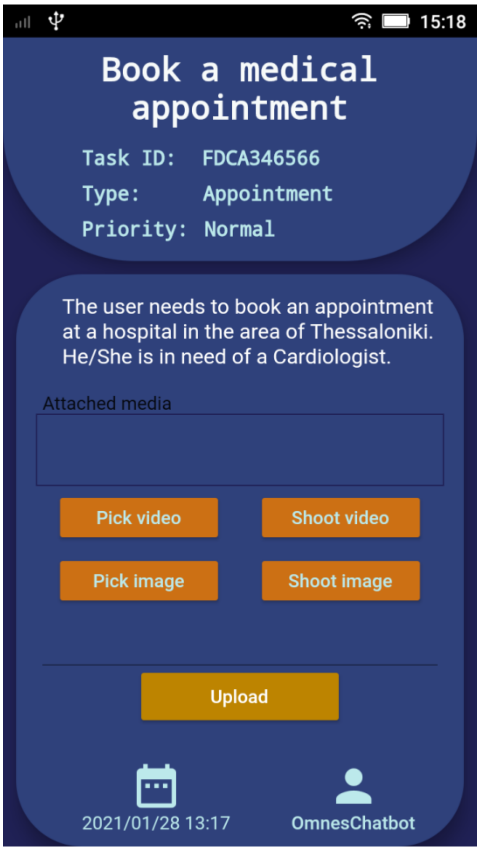
You will be notified when new tasks are assigned to you

| | |
|---|---|
| When a new task arrives, if the application is in the background or closed, a notification will be shown. You can click to open the app. | <br>15:11 ΠΕΜΠΤΗ 28/1/2021<br>Message from operator 15:08<br>Updated REBUILD task: Book an interpreter |
| If the application is active in the foreground, you will see it in the task list. The task list can be refreshed by sliding downwards with your finger. | <br>12:43<br>Tasksolver<br>Book a medical appointment<br>2021/01/18 13:36<br>OmnesChatbot<br>Book a medical appointment<br>2021/01/20 10:09<br>OmnesChatbot<br>Book an interpreter<br>2021/01/20 10:21<br>OmnesChatbot<br>Book a medical appointment<br>2021/01/20 10:24<br>OmnesChatbot |

By taping on a task, the task details can be seen. This is the actual task solving interface.

There are several options here: You can pick existing images or videos already stored on your mobile phone or you can shoot images and videos through the app.

Let's see how to shoot a video.



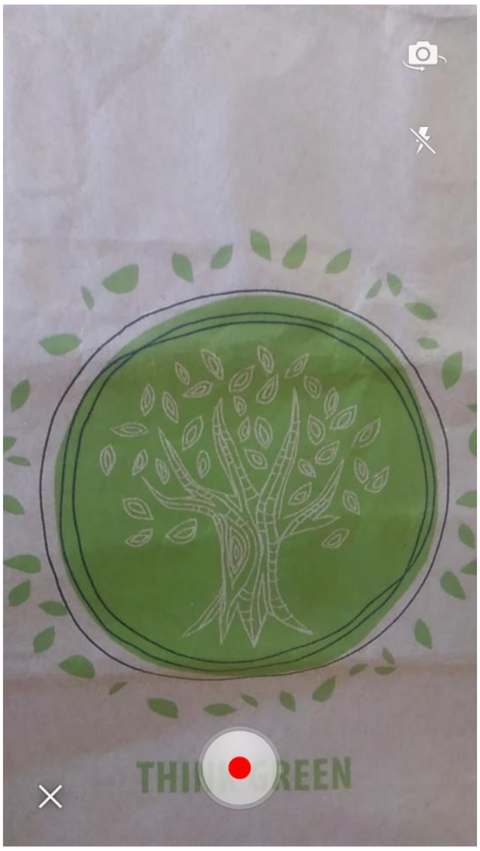
Book a medical appointment

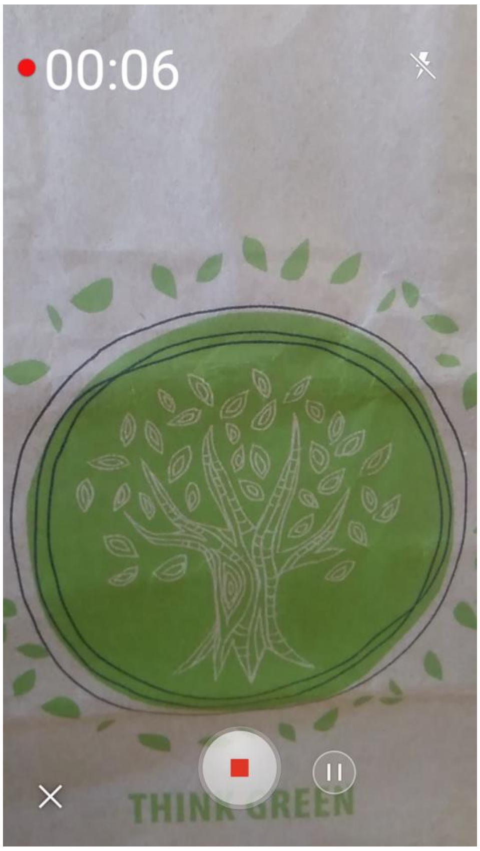
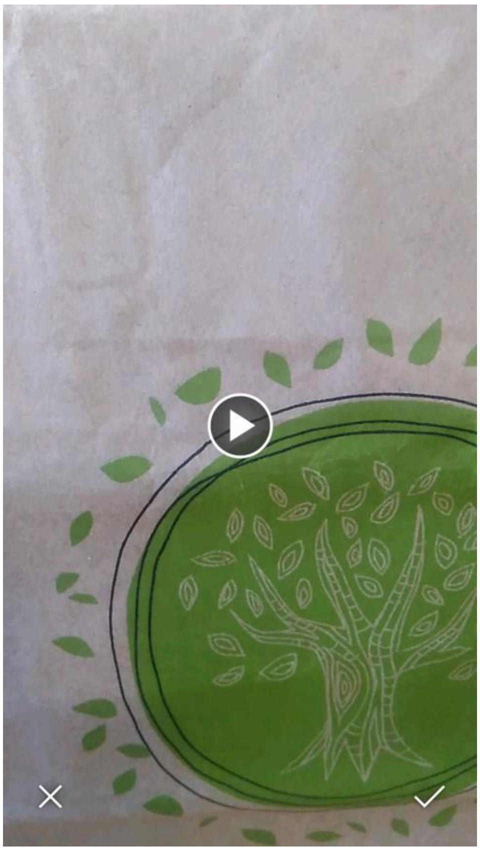
Task ID: FDCA346566
Type: Appointment
Priority: Normal

The user needs to book an appointment at a hospital in the area of Thessaloniki. He/She is in need of a Cardiologist.

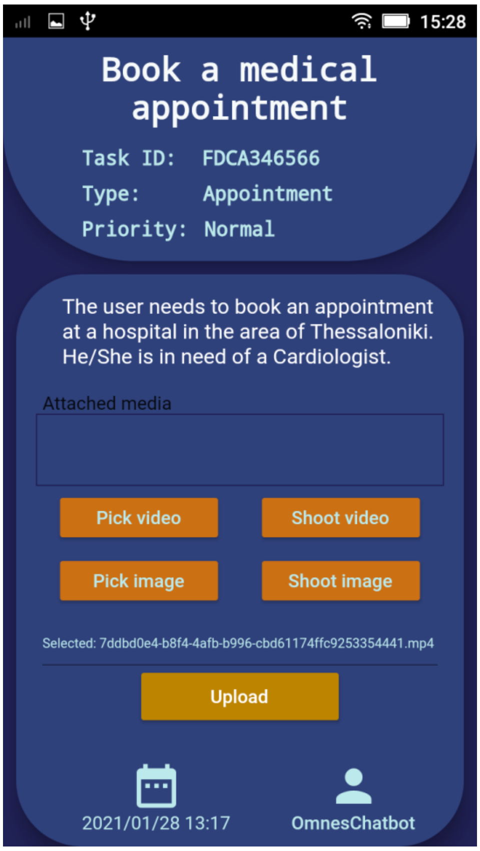
Attached media

After taping the "Shoot video" button, you can start recording the video.



| | |
|---|---|
| When you are done, you can tap the Stop button. |  |
| You can accept the video or discard it. |  |

After accepting it, you return to the previous interface. The name of the selected video appears above the Upload button.



15:28

Book a medical appointment

Task ID: FDCA346566
Type: Appointment
Priority: Normal

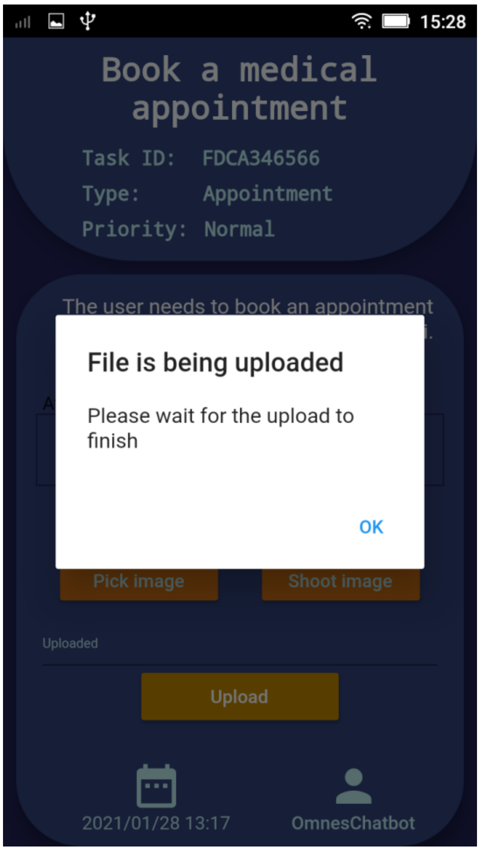
The user needs to book an appointment at a hospital in the area of Thessaloniki. He/She is in need of a Cardiologist.

Attached media

Selected: 7ddbd0e4-b8f4-4afb-b996-cbd61174ffc9253354441.mp4

2021/01/28 13:17

After pressing the Upload button, a message is shown to inform you that you have to wait for the video to be uploaded before you leave this screen and return to the task list.



15:28

Book a medical appointment

Task ID: FDCA346566
Type: Appointment
Priority: Normal

The user needs to book an appointment

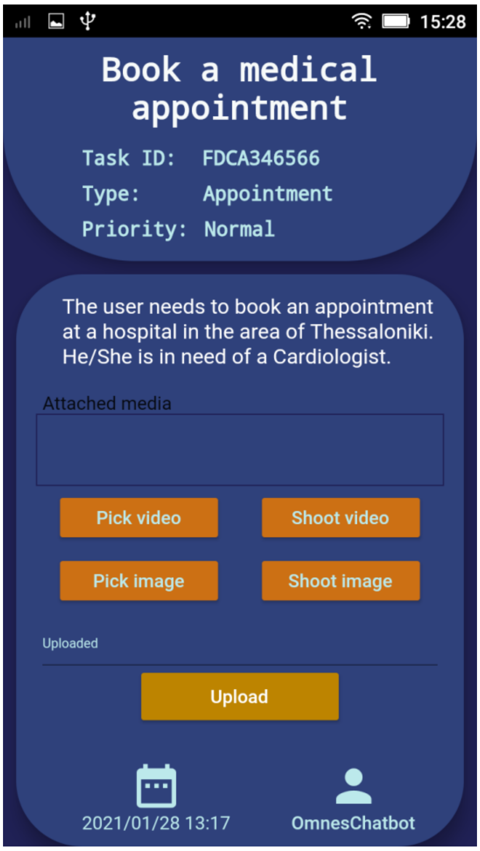
File is being uploaded

Please wait for the upload to finish

Uploaded

2021/01/28 13:17

When you see the message "Uploaded" above the Upload button, you are ok to go.



Book a medical appointment

Task ID: FDCA346566
Type: Appointment
Priority: Normal

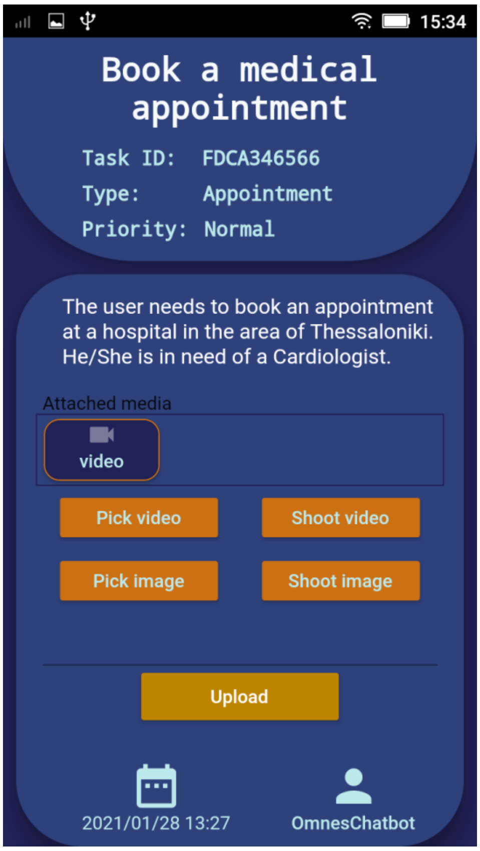
The user needs to book an appointment at a hospital in the area of Thessaloniki. He/She is in need of a Cardiologist.

Attached media

Uploaded

2021/01/28 13:17

Using the same procedure you can upload several images and videos. They will appear under "Attached media".



Book a medical appointment

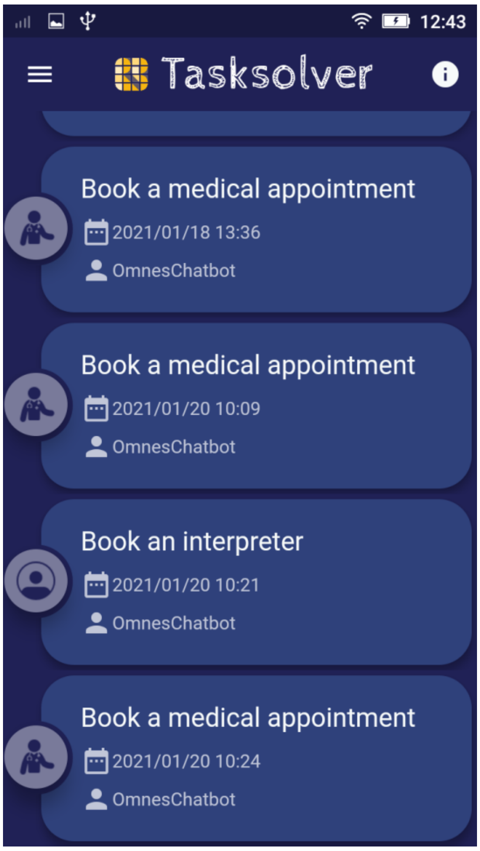
Task ID: FDCA346566
Type: Appointment
Priority: Normal

The user needs to book an appointment at a hospital in the area of Thessaloniki. He/She is in need of a Cardiologist.

Attached media

2021/01/28 13:27

You have solved the task! By taping on your phone's Back button you can return to the task list. If you tap it again, you will return to the initial sign in screen.



Book a medical appointment
2021/01/18 13:36
OmnesChatbot

Book a medical appointment
2021/01/20 10:09
OmnesChatbot

Book an interpreter
2021/01/20 10:21
OmnesChatbot

Book a medical appointment
2021/01/20 10:24
OmnesChatbot

# REBUILD

ICT-enabled integration facilitator and life rebuilding guidance

# Deliverable: D4.6 Scripted audio/video capturing for the illiterate

This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 822215.