



D5.7

First Responders Data Module Design

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List of Acronyms

AB	Advisory Board
App	Mobile Application
C&C	Command and Control Centre
EDXL-DE	Emergency Data Exchange Language – Distribution Element
EDXL-SitRep	Emergency Data Exchange Language – Situation Report
FCP	Forward Command Post
FR	First Responder
GNSS	Global Navigation Satellite Systems
GUI	Graphical User Interface
HTTP(S)	Hypertext Transfer Protocol (Secure)
IG	Information Gateway
REST	REpresentational State Transfer
SatCom	Satellite Communication
SP	Service Platform
SitRep	Situation Report
TR	Technical Requirement
UR	User Requirement
URI	Uniform Resource Identifier
VPN	Virtual Private Network
XMPP	Extensible Messaging and Presence Protocol

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Executive Summary

In this report, the HEIMDALL mobile application (app) and its specification are presented. The HEIMDALL app provides several system functions for and tailored to the FRs in the field, such as alerting features, situation report reception, messages exchange, map services including waypoints and transmission of information from the field to the command and control centre (C&C).

The smartphone application based on Android operating system has been developed as part of the HEIMDALL project to allow real-time communication with the first responder users on the field. The app communicates with the HEIMDALL platform via the information gateway (IG) and the service platform (SP), making use of internet connectivity available through the terrestrial communication infrastructure or the satellite-based broadband. In the first instance, the app will be made available only to the first responders.

The requirements for the app are presented in [1] and [2]. The service concept is presented [3]. Initial specification of this deliverable was presented in [4] draft version and the interfaces to alerting and situation report services are available therein. Other interfaces are detailed in [5].

1 Introduction

Smartphones have become a daily companion for most people. They are used for various applications such as reading news, exchanging of information and messages, taking pictures, navigating to locations, checking the close by stores and shops which are business as usual. From technical perspective, they are small handheld computers that provide comparably high processing powers, storage in the range of several gigabytes and displays that allow to catch many information on a single glance. Furthermore, they include cameras and access to global navigation satellite systems (GNSS) such as GPS and Galileo and provide means for standard and state of the art communication networks like Wi-Fi, Bluetooth, 4G and 5G. All of this, mobile and battery-powered. Consequently, they hold high potential also for first responders (FRs) in disaster situation and since they are commercial products and designed for mass-market, they are comparably cheap.

In this report, the HEIMDALL mobile application (app) and its specification are presented. The HEIMDALL app provides several system functions for and tailored to the FRs in the field. Being in the field during a disaster is a stressful situation that causes certain requirements on technological solutions. The HEIMDALL system provides and collects a lot of information; as such, it is especially important to not cause an overflow of information for the FRs. They should only receive the information they need to have. Also, technically the communication means might be occupied or damaged leading to less available bandwidth and only necessary information should be exchanged instead. HEIMDALL offers for FRs a work-around for this case, which is a commercial satellite communication system (SatCom), whose terminals provide also Wi-Fi access for the mobile phones. In order to tailor the information, a situation report (SitRep) can be transmitted from the HEIMDALL system and only dedicated fields are shown to the FR. The fields have been selected with the end user partners of the project and only display the necessary information. More information and services can be accessed from forward command posts (FCP) and command and control centres (C&C) by using the HEIMDALL system and the graphical user interface (GUI). Usually, the users there have a proper connection setup and need to have all information to make decisions on higher scale.

On the other hand, first responders on the field are a source of information for users at C&C. The HEIMDALL app provides several means that are state of the art to transmit information from the field to the C&Cs, such as sending the location, images, and provision of a chat tool. Special type of communication are the waypoints that have been designed during the HEIMDALL project, which allow for geo-referenced communication. The user at C&C or the app user can create a waypoint and transmit a message with linked coordinates to a set of users. The waypoint is then depicted on a map and can be replied.

The app includes capabilities for alert reception based on the de-facto standard for alerting: the common alerting protocol (CAP). It can be used for activating FRs or other organisations and dispatch them alert messages and instructions. During the HEIMDALL project, the development of the app has been focused on FRs; the general public is in any case a second stakeholder for the app. The idea is that depending on the used account for login, FR are provided with all functionalities or a limited set, e.g. only with alert reception, for the general public.

This document is organised as follows:

- Section 2 introduces the requirements that have been derived from user and system requirements
- In section 3 the app is presented in relation to the overall HEIMDALL system
- Section 4 illustrates the *black-box* and details the specification of the mobile application
- Test results are presented in section 5
- Section 6 concludes the report.

2 Technical Requirements

This section describes the technical requirements (TR) for the mobile application. These TRs have been derived from the user requirements (UR) identified during the four end user workshops held with the end user partners of the project and the advisory board (AB). These URs, along with the system requirements derived from them, have been documented in D2.9 [1] and D2.10 [2].

2.1 Smartphone Application

The smartphone application based on Android operating system has been developed as part of the HEIMDALL project to allow real-time communication with the first responder users on the field. The app communicates with the HEIMDALL platform via the information gateway (IG), making use of internet connectivity available through the terrestrial communication infrastructure or the satellite-based broadband. In the first instance, the app will be made available only to the first responders.

2.1.1 Interface Requirements

2.1.1.1 Hardware Interface

The mobile application shall be installed on an Android device. A camera, and GNSS signal need to be available. Internet connection is required and can be provided by the device, e.g. via Wi-Fi or 4G.

2.1.1.2 Software Interface

At least Android version 8.0.0 is required, later versions recommended. The app is available as APK file to the consortium external to the usual distribution stores which implies that installation from unknown sources is allowed. VPN is required to connect to the HEIMDALL network: OpenVPN Connect needs to be installed and active on the phone.

2.1.1.3 Communication Interface

In order to provide its services several protocols are used:

- HTTP restful webservices for the connection to the platform and using the available services.
- Extensible Messaging and Presence Protocol (XMPP) chat connection.
- Alert messages sent via the GIS engine shall be received in the mobile application via the Common Alerting Protocol (CAP).
- SitRep are received as EDXL-SitRep encapsulated in an EDXL-DE message.
- The devices must be included within the HEIMDALL VPN

2.1.2 Functional Requirements

2.1.2.1 Short-term Features

Table 2-1: Technical Requirement TR_DataFR _1

Requirement ID:	TR_DataFR_1
Related SR(s):	<ul style="list-style-type: none"> • Sys_GuiApp_1 • Sys_GuiApp_2
Description:	

A mobile application shall be implemented for both public (long-term) and first responders (in the short-term).
Rational: Both public and first responders require communicating with the system or receiving updates from the system.
Stimulus: The system is about to dispatch an alert to the public and first responders that needs to be received.
Response: A mobile application shall be implemented to receive that particular alert.
Verification Criterion: Check the availability of a mobile application for both public and first responders.
Notes: none

Table 2-2: Technical Requirement TR_DataFR_2

Requirement ID:	TR_DataFR_2
Related SR(s):	<ul style="list-style-type: none"> • Sys_GuiApp_3
Description:	
The first responders' mobile application shall be capable of logging in only first responder users.	
Rational: Logging-in enables to ensure that only first responders' users will access the data and services restricted to first responders.	
Stimulus: First responders' users require access to the mobile application.	
Response: System obtains first responders user's credentials, double check the validity of this information against the stored data in the database and, decides whether to grant access to the mobile application or not.	
Verification Criterion: Login to the mobile application as first responders' user and make sure that the mobile application grants access.	
Notes: none	

Table 2-3: Technical Requirement TR_DataFR_3

Requirement ID:	TR_DataFR_3
Related SR(s):	<ul style="list-style-type: none"> • Sys_GuiApp_4 • Sys_GuiApp_9
Description:	
The mobile application shall receive alert messages that are sent from the system.	
Rational: During an incident, the system will send alert messages to public and first responders to alert them of a risk and keep them updated.	
Stimulus: The system dispatches an alert message.	
Response: The mobile application receives the alert message and is displayed to the user.	

Verification Criterion: An alert is created at the GUI and dispatched. The alert is successfully received and displayed at the mobile application.
Notes: none

Table 2-4: Technical Requirement TR_DataFR_4

Requirement ID:	TR_DataFR_4
Related SR(s):	<ul style="list-style-type: none"> • Sys_GuiApp_5 • Sys_DataEx_7 • Sys_DataEx_8 • Sys_DataEx_9 • Sys_DataSitu_2
Description:	
The mobile application shall be capable of sending photos, extra incident details, incident reports, user's information, et al. to the HEIMDALL system. Also, the mobile application shall make sure to distinguish whether this information is sent from the public or from a first responder's user by including user's metadata.	
Rational: Relevant information received from both public and first responders might be extremely value for situational assessment, incident awareness, decision support, et al.	
Stimulus: A user requires sending some relevant information to the system regarding an ongoing incident.	
Response: The system is able to receive this information and display it in the GUI.	
Verification Criterion: Some relevant information is sent from the mobile application to the system. Once received this information, the GUI will display it to the user.	
Notes: none	

Table 2-5: Technical Requirement TR_DataFR_5

Requirement ID:	TR_DataFR_5
Related SR(s):	<ul style="list-style-type: none"> • Sys_GuiApp_6 • Sys_GuiApp_7 • Sys_DataEx_1
Description:	
The mobile application shall be capable to track and display the location of all first responders during an incident.	
Rational: First responders need to be aware of the location of all first responders during an incident at all times.	
Stimulus: The mobile application tracks the location of the first responders and sends updates to the system.	
Response: The mobile application is able to display the latest location of other first responders on a map.	

Verification Criterion: The mobile application shall track and display the latest location of other first responders on a map.
Notes: none

Table 2-6: Technical Requirement TR_DataFR_6

Requirement ID:	TR_DataFR_6
Related SR(s):	<ul style="list-style-type: none"> • Sys_GuiApp_8 • Sys_DSC_23
Description:	
The mobile application shall provide a chat feature to first responders and FCP users to easily communicate with the HEIMDALL platform.	
Rational: FR/ FCP users usually need to communicate with other users on the field and the command centre.	
Stimulus: A FR/ FCP user sends a chat message to a user (1) at the command and control centre and (2) on the field.	
Response: The HEIMDALL platform (case 1)/ mobile application (case 2) is able to receive the chat message.	
Verification Criterion: A message is sent from a FR/ FCP user to another FR/ FCP user and also to the C&C. The mobile application/ web- GUI shall be able to receive this chat message at the other end.	
Notes: none	

2.1.2.2 Mid-term Features

Table 2-7: Technical Requirement TR_DataFR_7

Requirement ID:	TR_DataFR_7
Related SR(s):	<ul style="list-style-type: none"> • Sys_GuiApp_10
Description:	
The mobile application shall allow the users to save a map of the Area of Interest (AOI) in the cache memory of the user's smartphone.	
Rational: The user would need to be able to have directions to the AOI even if the connectivity to the internet is absent/ limited.	
Stimulus: User locates the AOI on the map and saves a local copy for offline use.	
Response: A copy of the directions is saved locally on the user's smartphone.	
Verification Criterion: The user can retrieve the copy of the map saved on his/her smartphone.	
Notes: none	

Table 2-8: Technical Requirement TR_DataFR_8

Requirement ID:	TR_DataFR_8
Related SR(s):	<ul style="list-style-type: none"> • Sys_GuiApp_11
Description:	
The mobile application shall allow the users to send and receive waypoints.	
Rational: This will allow the first responder users to send and receive any updates to the default/pre-determined route based on any changes happened during an incident.	
Stimulus: The pre-determined route to a location has been modified	
Response:	
<ol style="list-style-type: none"> 1) The C&C user creates the new route on the GUI and sends it to the FR user 2) The FR user plots the new route and shares it with the C&C centre 	
Verification Criterion:	
<ul style="list-style-type: none"> • A registered first responder user is able to create and send waypoints to the C&C centre. • The first responder user is able to receive and view the waypoints received from the C&C centre on the app. 	
Notes: none	

Table 2-9: Technical Requirement TR_DataFR_9

Requirement ID:	TR_DataFR_9
Related SR(s):	<ul style="list-style-type: none"> • Sys_GuiApp_13
Description:	
The mobile application shall be able parse EDXL-DE messages.	
Rational: the application should be able to receive and parse standard based messages to display the content to the user	
Stimulus: the SP forwards an EDXL-DE message to the mobile application	
Response: The application parses the received content.	
Verification Criterion:	
The content is parsed and used if the reception details fit.	
Notes: none	

Table 2-10: Technical Requirement TR_DataFR_10

Requirement ID:	TR_DataFR_10
Related SR(s):	<ul style="list-style-type: none"> • Sys_GuiApp_14
Description:	
The mobile application shall be able to illustrate specific fields of EDXL-SitRep messages.	

Rational: the mobile applications should show tailored information from the platform for first responders in the field.
Stimulus: the SP forwards an EDXL-SitRep message encapsulated in an EDXL-DE message.
Response: The app parses the message and displays the messages details to the user
Verification Criterion: The content of the received message is shown to the user.
Notes: none

2.1.2.3 Long Term Features

Table 2-11: Technical Requirement TR_DataFR_11

Requirement ID:	TR_DataFR_11
Related SR(s):	<ul style="list-style-type: none"> • Sys_Gui_131
Description:	
The mobile application shall allow the user on the field to verify the weather conditions available on the platform from external sources.	
Rational: Weather data fed to the platform are from external sources which usually get data from weather stations which could be located far from the area where the hazard takes place. Verification from the users on the field will allow gathering more accurate data allowing to make more accurate decisions.	
Stimulus: The user opens the weather conditions available on the platform and verifies it with external weather sources.	
Response: The GUI provides weather conditions and allows users to verify it.	
Verification Criterion: The user on the field can view the weather data on the platform and can approve if the data is correct.	
Notes:	

Table 2-12: Technical Requirement TR_DataFR_12

Requirement ID:	TR_DataFR_12
Related SR(s):	<ul style="list-style-type: none"> • Sys_GuiApp_12
Description:	
The mobile application shall provide a read receipt to the user when a message send to the web-based platform has been received and read by the user.	
Rational: in order to grant transparency to the user about the access of information.	
Stimulus: A user reads a message	
Response: The application indicates to other users that the message has been read.	

Verification Criterion:
Other users can verify that a user has received and read a message.
Notes: none

2.1.3 Non-Functional Requirements

No non-functional requirements have yet been identified as part of the requirements definition exercise.

3 Reference Architecture

Figure 3-1 shows the overall architecture of the HEIMDALL system. The mobile application for FRs and the public is enclosed in the green box appearing on the right-hand side of the picture. The app is connected to the information gateway (IG) for receiving CAP and EDXL messages. On the other hand, it is directly connected to the service platform (SP) for other services.

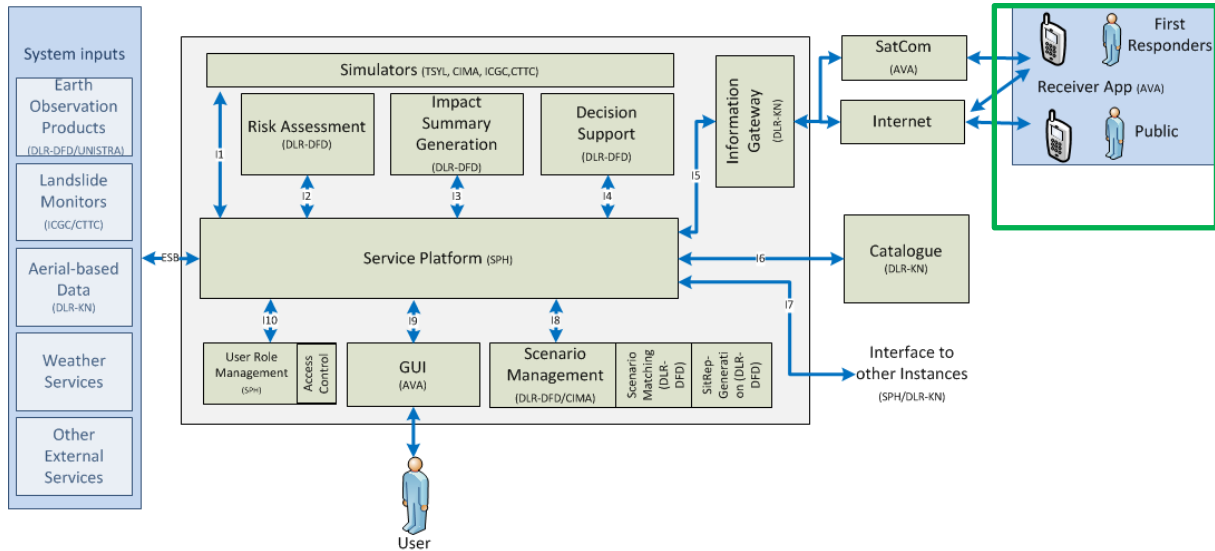


Figure 3-1: Overall architecture of the HEIMDALL system. Mobile application module is marked as a green box.

D2.11 – *Service Concept Specification* [3] - detailed the service value chain of the HEIMDALL system. The main services offered by the mobile application are summarised in Table 3-1.

Table 3-1: Products provided by the app

Product	Short description	Format
Authentication	Only first responders with HEIMDALL credentials will be able to access the FR mobile application services.	Object represented by e.g. JSON
Alerts receiver	Reception of alerts/information messages sent from the HEIMDALL platform to alert, update and notify of incidents to both citizens and first responders.	CAP
Situation report receiver	Reception of situation reports sent from the HEIMDALL platform which will be presented to the FR.	EDXL-DE, EDXL-SitRep
First responders' location	The FR can send its location during an incident - providing a wider awareness of where exactly each individual is.	Object represented by e.g. JSON, map view
Image dispatch	The mobile app user can send images to the HEIMDALL platform. The images are geo-referenced.	JSON
Chat	A simple XMPP client that enables the first responders to exchange information with other first responders as well as with the command and control centres.	XMPP

In order to provide these services, the mobile application interfaces the IG and the SP. The SP provides interfaces for authentication, chat, image and location transmission. The mobile application works as client in these cases. For the alerting and situation report service, the mobile application works as receiver, it receives and displays the messages created at the IG via the GUI. The detailed interfaces are summarized in Table 3-2. If the services are provided via SatCom, Wi-Fi, 3G, 4G or 5G, they are transported by the the lower layers of the protocol stack with no interaction with the app as long as the bandwidth is sufficient. More details on the interfaces can be found in the IG specification [4] and the SP specification [5].

Table 3-2: Interface between the GUI and the SP

Interface	Short Description	Methods	Protocol
IG	IG provides URL to CAP or EDXL message	GET	HTTP(S)
IG-SP-APP	The SP provides the URL to the app using a dedicated chat room, only those modules listen to	URL	XMPP
SP	The products for and form the SP are posted to a dedicated chat room, only those modules listen to. The chat room is named after the user logged in at the app	JSON	XMPP
SP-Login	For authentication the user login service from the SP is used	POST	HTTP(S)

4 HEIMDALL Mobile Application

In order to support as many devices as possible, the market leading Android operating system has been selected to design the mobile applications. The application has been implemented during the project. Likewise, it can envisage to develop an iOS application with the same features in the long term.

The app provides HEIMDALL's end users with an alternative way to receive and provide relevant information from and to the system. From the service point of view, two smartphone applications, one for the public and one for the FR in the field, are available. However, the public one can be seen as a light version of the FR since it offers reduced functionality but the core is the same. Consequently, a single smartphone application has been developed during the project that includes all functionalities for the FR and could potentially be reduced to a version for the public, although not considered relevant for the scope of the final demo and hence not addressed during the course of the project.

The app is not publicly available and works only with connection to the SP so within the HEIMDALL VPN. The following sections illustrate the implementation work done and the design of the app for the various provided services.

4.1 Login and Start Page



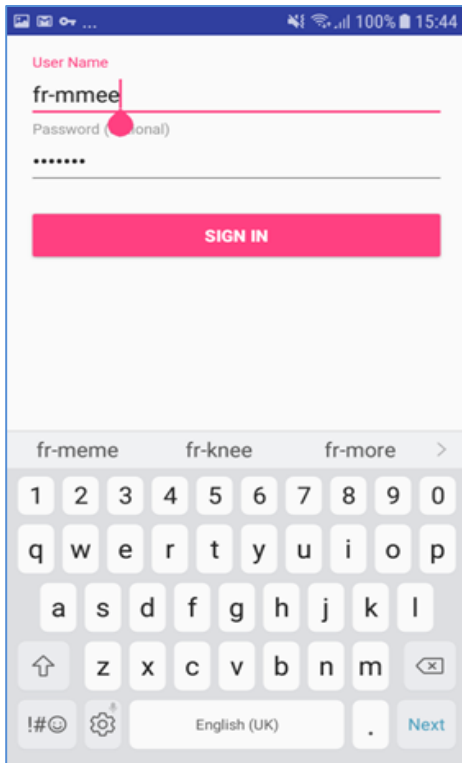
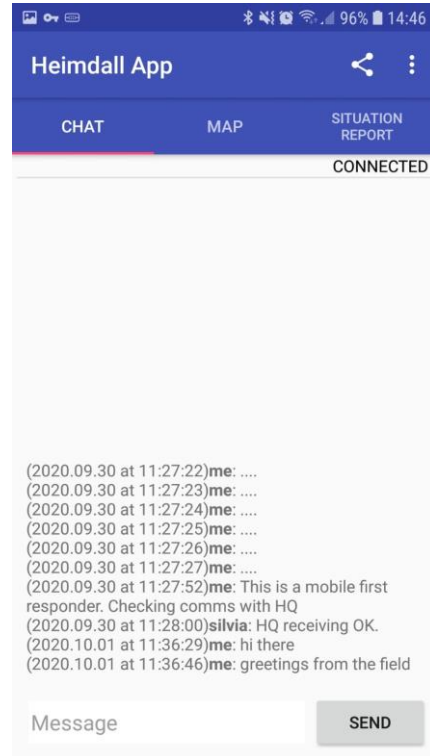
Figure 4-1 (a) shows the login window of the HEIMDALL smartphone application, where the user can enter his/her username and password to connect to the HEIMDALL system. Access is only granted if credentials are correct. The SP login service is contacted for this authentication purpose. Successful login will first show the window presented in Figure 4-1 (b) and provides access to the services presented in the following. The chat tab is the default view and the user can see if new messages arrived or send messages her-/himself. On the top bar the name of the app is presented ("HEIMDALL App" as banner) to highlight to the user the application used. Next to it on the top right corner there is a sharing button  and a settings button . Selecting the sharing button will result in the options presented in Figure 4-2 (b): sharing either a picture or a location.

Figure 3-1 presents the options for the settings button. First, the user can either logout, for instance if another user profile should be used or the app should be locked. Second, the user can download the offline map to have it available on the device even without internet connection as required by the end users. Selecting this will open the window presented in Figure 4-3. The user can move around with the map, zoom in and out. By selecting the download button, the area shown within the red rectangle will be stored offline.

Below the top bar, there is a menu with three tabs which allows to switch between the chat, the map (section 4.3) and the situation report (4.4). Reception of certain data from the HEIMDALL platform, such as alerts (section 4.5) and SitReps, trigger a notification at the Android operating system. The notification will be shown in the notification menu of the phone. Selecting it will cause the app to show the data.

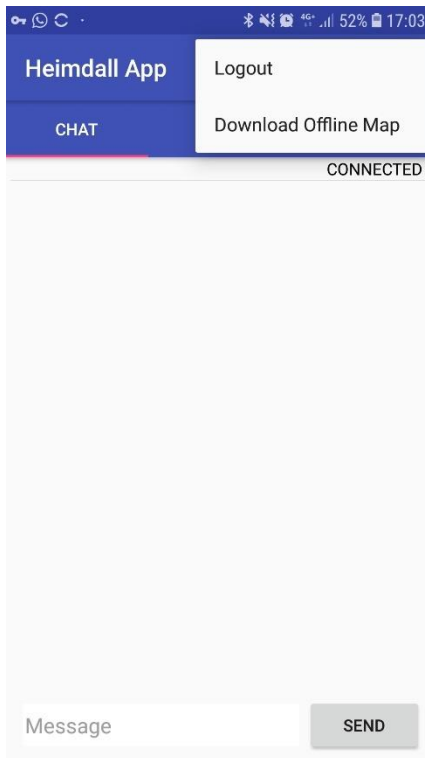


(a)

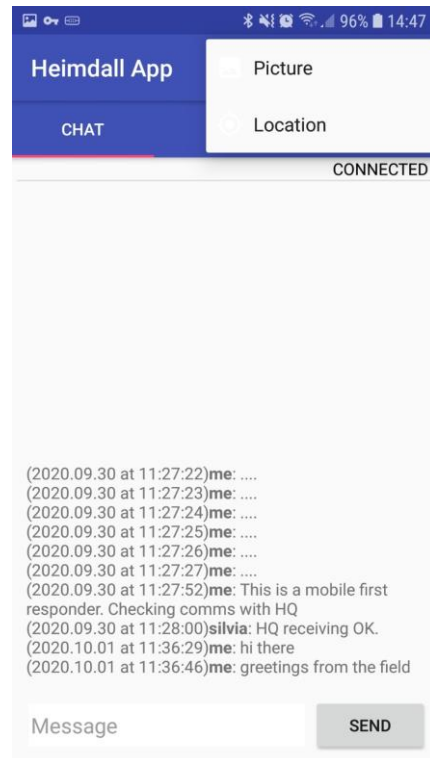


(b)

Figure 4-1: (a) Login window of HEIMDALL app (b) Menu options on the main window of HEIMDALL app.



(a)



(b)

Figure 4-2: (a) Options selectable from the settings menu (b) Options selectable from the sharing menu

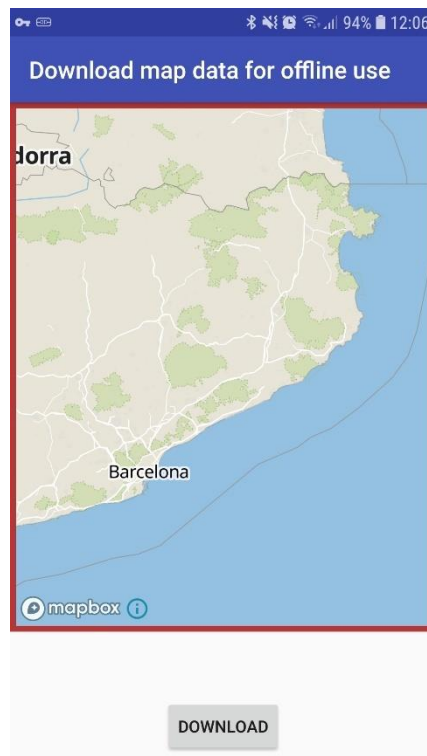


Figure 4-3: offline map selection

4.2 Sharing Information

Using the sharing button enables the user to select to share with the C&C either the current location and pictures. If the location is selected, a preview is open on a map and the user can see and confirm the location before transmitted as presented in Figure 4-4 (a). The camera app of Android system will be launched, if the user selects to share a picture. The picture can be taken as usual with this app, afterwards the user is asked to give a confirmation if the picture shall be transmitted. Figure 4-4 (b) shows this confirmation window where the user can select to send it or to retake a new image, pressing the "return" button of the phone will bring the user back to the main screen. The images are geotagged and expected as such at the SP interface. The location services of the smartphone need to be enabled for this.

If the user selects to transmit the location or the image, the app uses the XMPP interface to the SP to forward the data embedded in JSON with meta-data like the geo-tag. The data will cause a notification at the HEIMDALL GUI for the C&C user about new data linked to the user of the mobile application.

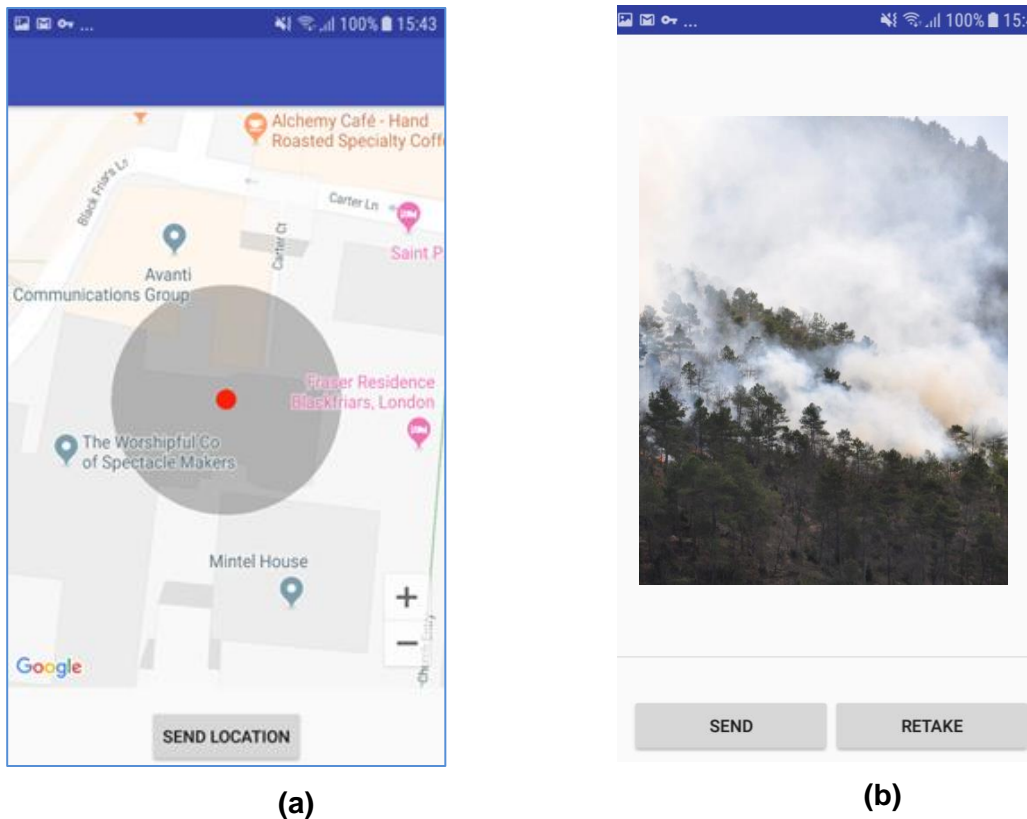


Figure 4-4: (a) Sharing position (b) Sharing an Image

4.3 Map and Waypoints

Figure 4-5 (a) presents the map tab of the app. It displays a compass for orientation and has a “go to my location” button at the lower right corner in pink.

Main part of the window is the map itself. The user can move around and zoom in and out with touch moves known from similar applications. This tab uses the Mapbox Maps SDK for Android from MAPTILER and OpenStreetMap in telemetry settings. This is indicated in the lower left corner.

The user can see the locations of other FRs on the main map with a red marker, which can also be seen in Figure 4-5 (a) using test data. Waypoints are also indicated on the main map; one example is shown in the figure and is represented as green icon with the check mark. This indicates a waypoint that has been answered already, new waypoints that have not been addressed are marked with a red icon and a question mark. If such a point is selected, the dialog in Figure 4-5 (b) is shown. It shows the headline “Waypoint” at which below the request of the C&C user is shown followed by a line where the user can put in answers using the keyboard. After the waypoint has been addressed the icon turns into the green check mark.

The usual process with waypoints is:

- A C&C user creates a waypoint at a location with a description, like for instance “check out this building”
- Forward this to an FR in the field
- The FR moves to the location and performs the task requested by the C&C user
- The FR answers the waypoint with information requested.

The process has been extended such that the FR is able to create waypoints and forward it to C&C users. This can be started by a long touch on the map, which shows a dialog to create a

new waypoint. However, this is not fully integrated into the overall system and lacks of the possibility to add a recipient.

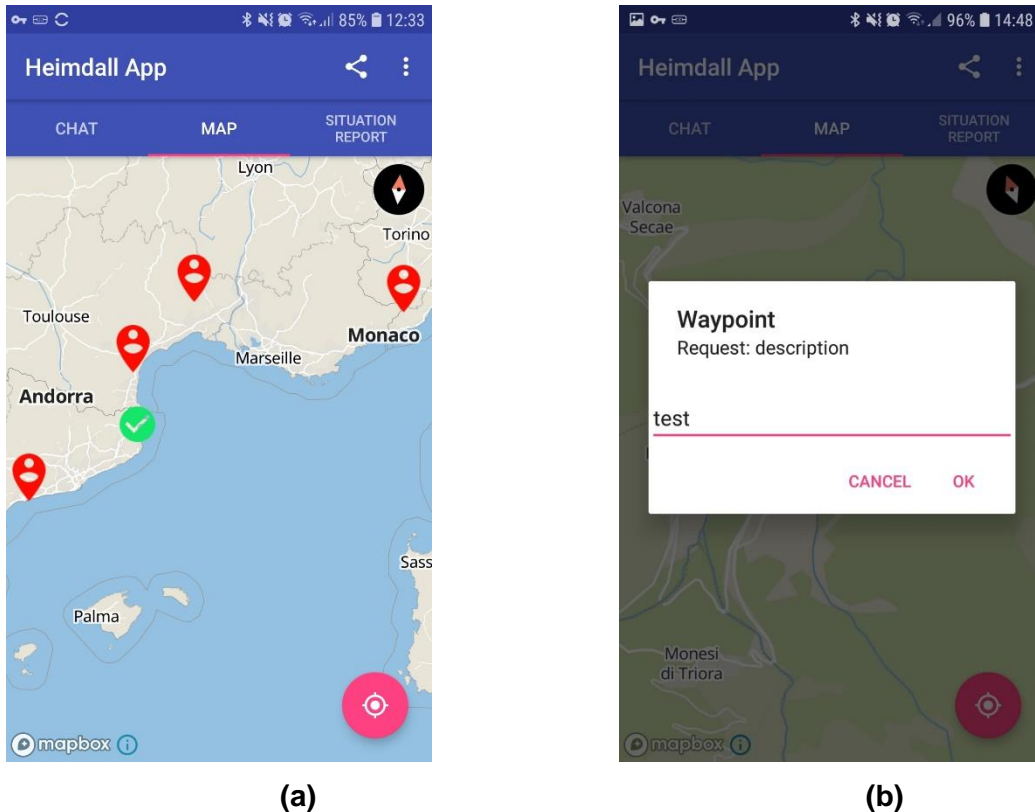


Figure 4-5: (a) Map and waypoints (b) Reply a waypoint

4.4 Situation Report Receiver

Situation reports are generated from C&C users using the scenario structure [6], the SitRep generation module [7] and the IG [4]. They are transmitted by the IG in EDXL-SitRep format embedded in an EDXL-DE. The IG and SP take care about the user selection and addressing – so if the app receives a message it only shows it without further processing. However, only certain fields are shown as specified with the end users to prevent an information overflow for the FR. Figure 4-6 shows the message that is presented to the FR and the according parameters that have been agreed with the end users. Some fields are empty in this example which means that they are not set. A notification alerts the user if a new report is received and the data in the tab is updated. The mobile application shows only the latest received report and does not include a history.

The parameters are an initial set, the end user required actually to also include certain simulation results, like the forecasted hazard extend and other parameters. This is planned for the long term, where it is thought to show the transmitted simulation result at the map.



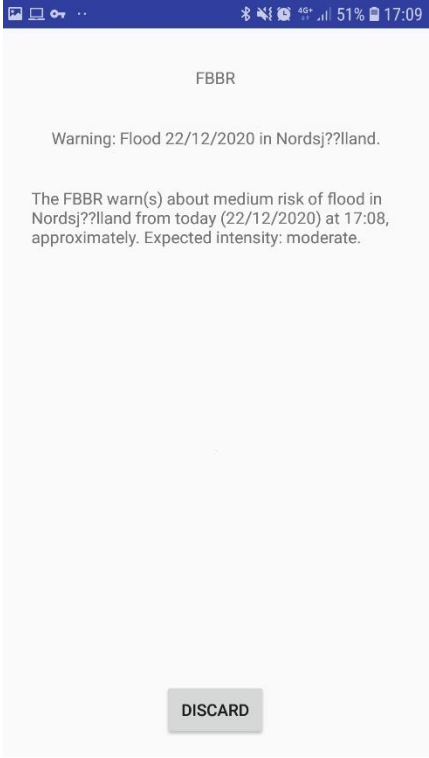
Figure 4-6: SitRep illustration

4.5 Alert Receiver

The mobile application is also an alert receiver. The alert messages are using the CAP protocol and are generated by the user using the IG [4]. The reception of an alert will cause a notification, which is exemplary shown at Figure 4-7 (a). If this notification is selected the app will display the included messages as presented in Figure 4-7 (b). The shown fields are directly read from the CAP message, they include first the sender, then the headline field and last the description and instruction field merged in one block.



(a)



(b)

Figure 4-7: (a) Alert notification (b) Alert message displayed

5 Test Plan

This section details the test plans carried out for the features implemented at the app for the four system releases and demonstrations.

Table 5-1: Test Plan *TS_GUI_01*

Test ID	<i>TS_GUI_01</i>
Requirements to be verified	<ul style="list-style-type: none"> • <i>TR_DataFR_1</i> • <i>TR_DataFR_2</i>
Test objective	To verify that the app can be used by FR user
Test procedure	1. FR users of the HEIMDALL system tries to log in using correct credentials
Test prerequisites/configuration	<ul style="list-style-type: none"> • The phone needs to be connected to the HEIMDALL VPN • Location service must be enabled
Success criteria	The user can login using the credentials.
Results analysis	
Success	Passed

Table 5-2: Test Plan *TS_GUI_02*

Test ID	<i>TS_GUI_02</i>
Requirements to be verified	<ul style="list-style-type: none"> • <i>TR_DataFR_1</i>
Test objective	To verify that the app holds the potential to be modified for public users in the long term
Test procedure	1. Not available
Test prerequisites/configuration	
Success criteria	The structure of the app allows to disable certain functionality for some users
Results analysis	The tab structure provides it. Based on the user account logged in certain tabs can be dis-/enabled.
Success	Passed

Table 5-3: Test Plan *TS_GUI_3*

Test ID	<i>TS_GUI_3</i>
Requirements to be verified	<ul style="list-style-type: none"> • <i>TR_DataFR_3</i>
Test objective	To verify that the app is able to receive alert messages
Test procedure	1. A test message is created at the IG and transmitted via the SP interface
Test prerequisites/configuration	<ul style="list-style-type: none"> • The phone needs to be connected to the HEIMDALL VPN • Location service must be enabled

	<ul style="list-style-type: none"> The user is logged in
Success criteria	The alert is received at the mobile application which shows a notification about the reception
Results analysis	
Success	Passed

Table 5-4: Test Plan *TS_GUI_4*

Test ID	<i>TS_GUI_4</i>
Requirements to be verified	<ul style="list-style-type: none"> <i>TR_DataFR_4</i>
Test objective	To verify that the app is able to send picture to the platform
Test procedure	<ol style="list-style-type: none"> The user selects to share a picture The user takes a picture The user confirms to transmit it
Test prerequisites/configuration	<ul style="list-style-type: none"> The phone needs to be connected to the HEIMDALL VPN Location service must be enabled The user is logged in
Success criteria	The image is received at the SP and forwarded to the GUI where a notification is shown and the image can be viewed.
Results analysis	
Success	Passed

Table 5-5: Test Plan *TS_GUI_5*

Test ID	<i>TS_GUI_5</i>
Requirements to be verified	<ul style="list-style-type: none"> <i>TR_DataFR_4</i> <i>TR_DataFR_6</i>
Test objective	To verify that the app is able to send incident details, reports and user's information
Test procedure	<ol style="list-style-type: none"> The user types in the chat the information for the C&C
Test prerequisites/configuration	<ul style="list-style-type: none"> The phone needs to be connected to the HEIMDALL VPN Location service must be enabled The user is logged in
Success criteria	The text is forwarded to the C&C users and can be seen at the HEIMDALL GUI
Results analysis	
Success	Passed

Table 5-6: Test Plan *TS_GUI_6*

Test ID	<i>TS_GUI_6</i>
Requirements to be verified	<ul style="list-style-type: none"> • <i>TR_DataFR_4</i>
Test objective	To verify that the app is able to distinguish if data comes from FR or public user
Test procedure	<ol style="list-style-type: none"> 1. The user logs in as FR user 2. The user transmits information 3. The user logs out 4. The user logs in as public user 5. The user transmits information
Test prerequisites/configuration	<ul style="list-style-type: none"> • The phone needs to be connected to the HEIMDALL VPN • Location service must be enabled
Success criteria	At the platform the user can see if it is a FR user or a user from the public that forwarded information
Results analysis	No public user available
Success	Not tested

Table 5-7: Test Plan *TS_GUI_7*

Test ID	<i>TS_GUI_7</i>
Requirements to be verified	<ul style="list-style-type: none"> • <i>TR_DataFR_5</i>
Test objective	To verify that the app is able to track and display the location of all FRs during an incident
Test procedure	<ol style="list-style-type: none"> 1. The user opens the map tab
Test prerequisites/configuration	<ul style="list-style-type: none"> • The phone needs to be connected to the HEIMDALL VPN • Location service must be enabled • The user is logged in
Success criteria	The user can see the location of other FRs
Results analysis	Real-time tracking is not possible as the users have to update their location manually.
Success	Passed

Table 5-8: Test Plan *TS_GUI_8*

Test ID	<i>TS_GUI_8</i>
Requirements to be verified	<ul style="list-style-type: none"> • <i>TR_DataFR_7</i>
Test objective	To verify that the app is able to save parts of the map selected by the user offline

Test procedure	<ol style="list-style-type: none"> 1. The user selects to download the map for offline usage 2. The user selects the area to be downloaded 3. The user set the phone offline, e.g. by using the flight mode
Test prerequisites/ configuration	<ul style="list-style-type: none"> • The phone needs to be connected to the HEIMDALL VPN • Location service must be enabled • The user is logged in
Success criteria	The user can still see the the map and the included information within the selected area
Results analysis	Actually, preventing full offline mode is the login. The user can see the map if he is logged in already, but the phone is going offline while logged out, the user cannot access the map.
Success	Passed

Table 5-9: Test Plan *TS_GUI_9*

Test ID	<i>TS_GUI_9</i>
Requirements to be verified	<ul style="list-style-type: none"> • <i>TR_DataFR_8</i>
Test objective	To verify that the app is able to receive waypoints
Test procedure	<ol style="list-style-type: none"> 1. A C&C user creates a waypoint and transmits it
Test prerequisites/ configuration	<ul style="list-style-type: none"> • The phone needs to be connected to the HEIMDALL VPN • Location service must be enabled • The user is logged in
Success criteria	The user is notified and can see the waypoint on the app
Results analysis	The notification is not shown, but the waypoint is updated on the map after a restart of the app
Success	Partially

Table 5-10: Test Plan *TS_GUI_10*

Test ID	<i>TS_GUI_10</i>
Requirements to be verified	<ul style="list-style-type: none"> • <i>TR_DataFR_8</i>
Test objective	To verify that the app is able to send waypoints
Test procedure	<ol style="list-style-type: none"> 1. The user selects the map tab 2. The user selects and holds a location on the map to create a waypoint 3. The user selects to transmit the waypoint
Test prerequisites/ configuration	<ul style="list-style-type: none"> • The phone needs to be connected to the HEIMDALL VPN • Location service must be enabled • The user is logged in

Success criteria	The waypoint is transmitted and received at the GUI
Results analysis	The waypoint is generated and transmitted, the GUI shows a notification, but no recipient selection is possible and hence the waypoint cannot be assigned by the SP or GUI.
Success	Partially

Table 5-11: Test Plan *TS_GUI_11*

Test ID	<i>TS_GUI_11</i>
Requirements to be verified	<ul style="list-style-type: none"> • <i>TR_DataFR_9</i> • <i>TR_DataFR_910</i>
Test objective	To verify that the app is able to parse EDXL-DE and -SitRep messages and illustrate the SitRep parameters
Test procedure	1. A C&C user creates a SitRep for the app and transmit it
Test prerequisites/configuration	<ul style="list-style-type: none"> • The phone needs to be connected to the HEIMDALL VPN • Location service must be enabled • The user is logged in
Success criteria	The app notifies the FR about a new incident report and presents the parameters specified
Results analysis	
Success	Passed

6 Conclusion

This document presented the design and implementation of the mobile application, developed mainly for the first responders in the field. The app, however, includes functionalities that can be useful for public users as well and can be tailored for them by disabling certain features based on the user account used. The app connects to the SP and IG and provides services for:

- Alerting
- Situation report
- Waypoints
- Location tracking
- Information exchange (messages and pictures)

Most functionalities have been successfully tested and evaluated with the end user partners. Some features hold capabilities to be possibly improved for future development beyond HEIMDALL timeframe, such as the waypoints, a library for received alert, push to talk voice communication and a real-time tracking of the location.

7 References

- [1] Barth, B. (2020), HEIMDALL D2.9: "HEIMDALL Requirements Report – Issue 4"
- [2] Barth, B. (2021), HEIMDALL D2.10: "HEIMDALL Requirements Report – Issue 5"
- [3] Barth, B. (2018), HEIMDALL D2.11: "Service Concept Specification"
- [4] Muna, J. (2021) HEIMDALL D4.15: "Communication to remote areas – design and specification – final"
- [5] Pantazis, S. (2020), HEIMDALL D4.2: "Service Platform Design and Specifications – Final"
- [6] Friedemann, M. (2020), HEIMDALL D6.15: "Scenario Specification, Scenario Management Specification and Scenario and Situation Metrics - Final"
- [7] Friedemann, M. (2020), HEIMDALL D6.8: "Situation Assessment, Impact Summary Generation and sCOP/SITREP Specification and Implementation Report – Final"

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