D3.12

Analysis of Societal Acceptance and Ethical Acceptability – Issue 2

Instrument	Collaborative Project
Call / Topic	H2020-SEC-2016-2017/H2020-SEC-2016-2017-1
Project Title	Multi-Hazard Cooperative Management Tool for Data Exchange, Response Planning and Scenario Building
Project Number	740689
Project Acronym	HEIMDALL
Project Start Date	01/05/2017
Project Duration	42 months
Contributing WP	WP3
Dissemination Level	PU
Contractual Delivery Date	M19
Actual Delivery Date	05/12/2018
Editor	Solange Martinez Demarco (EKUT)
Contributors	Prof. Dr. Regina Ammicht Quinn, Andreas Baur, Dr. Anne Burkhardt, Friedrich Gabel (EKUT)

Document History			
Version	Date	Modifications	Source
0.1	21/09/2018	First draft	EKUT
0.2	18/10/2018	Second draft	EKUT
0.3	29/10/2018	Third draft	EKUT
0.4	08/11/2018	Internal review	EKUT
0.5	14/11/2018	Ready for quality assurance review	EKUT
0.6	04/12/2018	Quality assurance review performed	DLR-KN
1.0.D	05/12/2018	Final version	EKUT
1.0.F	05/12/2018	Approval for submission	DLR-KN

Table of Contents

List of Acronyms

C&C	Command and Control Centre
DLR	Deutsches Zentrum für Luft- und Raumfahrt e.V. (German Aerospace Center)
DLR-KN	Deutsches Zentrum für Luft- und Raumfahrt e.V. (German Aerospace Center); Institute of Communications and Navigation
EKUT	Eberhard Karls Universität Tübingen (University of Tübingen)
EU	European Union
WP	Work Package

Intentionally blank

Executive Summary

This deliverable is the second issue reporting on ethical acceptability and societal acceptance of the HEIMDALL system. In this issue, the framework on societal acceptance and ethical acceptability outlined in [5] is further developed and sharpened along the empirical findings from the first three focus group discussions conducted in February 2018 in Milan, Italy.

Firstly, it presents a summary of the theoretical aspects of societal acceptance and ethical acceptability and includes a brief explanation of the methods used for empirically gathering data, as well as their subsequent analysis to assess the acceptance of HEIMDALL.

Among the many topics discussed in the focus groups, six major themes were identified and studied: 1) different visions of HEIMDALL; 2) working on the development of the system in a multidisciplinary team; 3) commercialisation of HEIMDALL; 4) decision-support tool; 5) trust in the system; and, 6) data privacy and security. Although these are issues on their own, they are intertwined with each other and the assessment continuously referenced these other points. The results of the analysis of these discussions highlight that there are a number of tensions and challenges but, at the same time, they show the progress that has been made in order to formulate specific requirements for an ethical and social acceptance of the system.

Finally, some concrete recommendations have been made in terms of further addressing these issues and ensuring the societal acceptance and ethical acceptability of HEIMDALL. In this regard, bridging the gap between technical and end-users profiles is an ongoing challenge that should not be considered resolved until the end of the project. Commercialising the system implies a business plan that takes into account multiple interests and objectives, as well as economic and environmental differences among EU countries. Filtering information and unloading the cognitive load require to achieve a balance between presenting the most important data and influencing decisions. Also, in the disaster management field trust is a value based on personal contact and interaction, therefore, HEIMDALL should support current responsibilities structures and improve the cooperation among first responder organisations. Lastly, data quality, data protection and security measures are vital points to hinder misuses, injustices and ensuring societal acceptance.

1   Introduction

In the first issue on societal acceptance and ethical acceptability [5] it was claimed that re-quirements for the HEIMDALL system shall not only include technical reasons and issues which are necessary in terms of ergonomics, such as "What are the problems that have to be solved or topics that have to be dealt with in order to get the HEIMDALL system running?", but also requirements on the needs and wishes of the potential end-users. In addition, it was also stated that these requirements are connected with the contribution (positive/negative) and the influence that HEIMDALL can produce in our vision of a good life for everyone (see Figure 1-1).
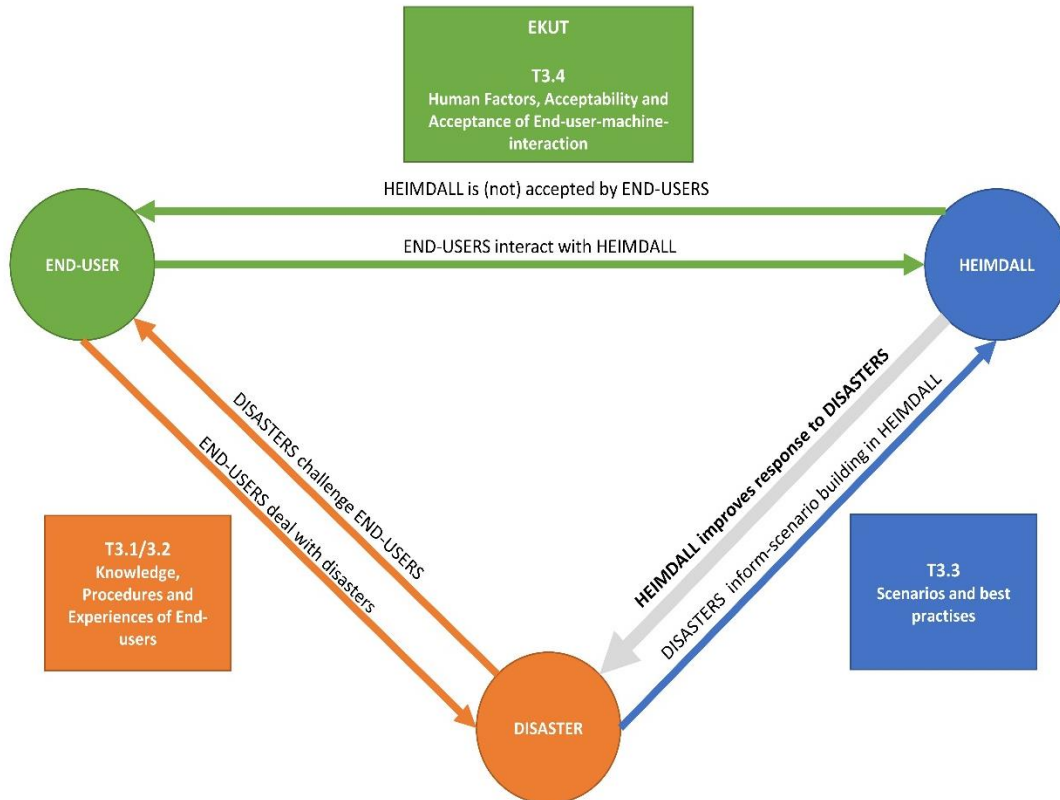

Figure 1-1 The role of WP3 in HEIMDALL (own compilation)

In order to achieve this aim, [5] presented a theoretical framework for dealing with potential issues that might evolve in the context of societal acceptance and ethical acceptability. Fur-thermore, it was stated that in order to transform this framework into requirements for the HEIMDALL system, a discussion on the vision of HEIMDALL has to take place. The reason for this lies in the value-relatedness of these topics and therefore the consequences this might have on the society as a whole. Therefore, these discussions should take place within the consortium as well as with members of society. The discussions between end-users, fur-ther stakeholders and society regarding the HEIMDALL system should help to scrutinise the visions and aims involved in the development of the HEIMDALL system and adjust them along visions of a good life for everyone.

In this regard, this second issue presents the first results of these discussions, which have been taking place via email and during bi-weekly phone conferences, project meetings, and the three focus group discussions held in February 2018 in Milan, Italy. These conversations were based on two leading questions: "What are the ideas that the participants have about the HEIMDALL system in its current state?" (descriptive knowledge on societal acceptance) and "How should HEIMDALL look like?" (normative knowledge on (e.g. ethical) acceptability). The results of these discussions are signalling that there is still much work ahead in terms of arguments and values such as responsibilities of the different members of the consortium,

trust in HEIMDALL, commercialisation, and data privacy and security. Nevertheless, at the same time they show the progress that has been made in order to formulate specific requirements for an ethical and social acceptance of the system.

In this vein, the first part (chapter 2) of this deliverable provides a summary of the theoretical framework adopted to analyse societal acceptance and ethical acceptability and the main related questions mentioned in [5]. Chapter 3 outlines the methodology used for the focus group discussions as well as the methods used for evaluating the empirical information.

Chapter 4, consequently, presents the main findings of this process and discusses the implication this has on the conceptualisation of societal acceptance and ethical acceptability as well as the formulation of requirements for the project as such. Due to some overlap between the results of the empirical work done on societal acceptance/ethical acceptability and human factors (see [3], [4]), some results from the interviews are also presented here.

In chapter 5, the deliverable provides concluding remarks and some recommendations regarding requirements which should be taken into account for the further development of the HEIMDALL system.

2   Societal acceptance and ethical acceptability

2.1 Societal acceptance

According to [13] and [5], societal acceptance is "a favourable or positive response (including attitude, intention, behaviour and – where appropriate – use) relating to a proposed or in situ technology or socio-technical system [in this case, HEIMDALL], by members of a given social unit (country or region, community or town, household, and organization)" ([13]:9). As explained in [5], this is a working conceptualisation in need of empirical confirmation, which has already started and will be presented in this deliverable.

Because there has been a multiplicity of fields in which this topic has been studied there is a diversity of research methods that can be used for this purpose. In the case of the HEIMDALL project focus groups were selected as the means for analysing the societal acceptance of the system. The reason for this choice has been to focus on understanding the broad spectrum of stakeholders involved in the project and their attitudes opinions, behaviour, intention, and use of the system [13]. The objective is to elaborate on the values, attitudes, opinions, concerns, behaviour, and potential use that HEIMDALL generates on those most likely to be affected by it: end-users, technical staff, interest groups, citizens, and public authorities.

D3.11 [5] also explained that societal acceptance is a matter of time and development, not a one-time decision. As such, it means that the societal acceptance of HEIMDALL is a process, a co-evolution of the system and the diversity of social groups affected by it, as well as their context, e.g. historical, institutional, social, economic, and geographical conditions (at local, national and European level) [13]. Therefore, this issue presents a very specific challenge, one that affects HEIMDALL more than other systems given that HEIMDALL is not yet at a level of technological maturity allowing for the study of its societal acceptance at a particular location.

Thirdly, and connected with the previous point, acceptance is also a matter of power and its distribution. As HEIMDALL evolves, the stakeholders and their contexts are modified, and also the policy culture, policy decisions, instruments, and procedures that are part of the disaster management field might change. To answer to these two challenges, the proposal is to evaluate the "political acceptance in the sense of policy support by governmental levels, agencies and political parties" [13] and the individuals' (lay public, end-users, technicians, policy officials, others) attitudes, expectations, opinions, values, concerns, and behaviours. In other words, the focus is on the macro and micro levels, omitting the meso level as it identifies with the geographical space in which the technology is implemented that, due to the current development of HEIMDALL, cannot be studied in a specific community.

Finally, it was mentioned that focus groups with end-users not involved in the project and lay people, will also be a challenge in terms of level of knowledge, understanding, experience, and awareness. In that sense, and also addressing the time and development challenge, it was decided to firstly conduct three focus groups with the stakeholder groups that are part of HEIMDALL, and whose results will be presented in the following pages.

In sum, societal acceptance is a complex concept that requires an understanding of the different factors that play a role when studying its empirical manifestation. The selection of focus groups as the method to inquire about the societal acceptance of HEIMDALL offers the advantage of gathering several people to discuss about their values, attitudes, opinions, concerns, behaviour, and potential use of the system without requiring a deep understanding of it. Furthermore, as it will be made clear in following pages, time and development are two key elements for the acceptance of HEIMDALL. Once the system has achieved a certain level of development, the provisory outcomes can be presented to end-users, interest groups, citizens, and public authorities that will be invited to participate in two more focus groups to express and discuss their own opinion about HEIMDALL.

2.2 Ethical acceptability

In [5] it was outlined that one important factor that influences the societal acceptance of a technology is its ethical acceptability, which in itself encompasses two different perspectives: the technology being in accordance with one's beliefs and visions for a good life and the broader societal vision of how society should be and what role a technology plays in this.

First, ethical acceptability refers to the degree of accordance a technology has with personal beliefs and visions of a good life. In this vein, a technology that contradicts our beliefs will not be accepted and used [14]. Although this claim seems to be made pretty easy, the identification of values that are represented or pushed into the foreground by using a technology is a difficult task. One reason for this might be that a technology not always seems to be clearly value-related. For example, a software that allows access to sets of personal data might be easily associated with a questioning on personal beliefs concerning data protection. On the contrary, a system like HEIMDALL is much more indirectly or inconspicuously related to personal values. This shows the necessity of a broader discussion of the system with stakeholders as well as with members of society.

Another reason for the difficulty of identifying values related to the use of technology might be the differences in terms of how a value is regarded in different contexts and/or individual set of beliefs. Therefore, similar cases or technological modules might be seen as a problem by one person but not by another. Finally, judgements and values are strongly connected to emotions that might work as an argument on an individual level but have to be complemented by further inter-subjective reasoning to count as an argument on a societal level (the agreement on the type of society we want to live in). Even if the societal acceptance of a technology, a strategy or a procedure is high, it might be unacceptable in terms of ethical standards or values [14].

Second, ethical acceptability as a personal aspect of acceptance should also be analysed at a societal level by asking questions like "Should a technology be accepted?" or "Is a technology in line with the socially shared vision for a good life?". Since these questions refer to shared values, a purely empirical research using interviews or questionnaires is not sufficient but has to be complemented with an analysis of arguments and reasons. In this vein, the formulation of criteria of acceptability is less a definition than a study of the ongoing negotiation processes of arguments and values at a societal level.

In order to get these conversations started and as a framework for discussions on ethical acceptability, three perspectives, and therefore, potentially relevant values were identified in [5]: justice, responsibility and privacy. Based on the empirical work, these ideas were further developed, and the value of trust was added. Moreover, starting from the basic question "How could (the use of) the HEIMDALL system affect the society we want to live in in terms of justice, responsibility and privacy?", [5] offered several potential value-related questions or cases, which served as a basis for the preparation of the empirical work as well as for the formulation of requirements on ethical acceptability of the system. The questions were used as inputs for the focus group discussions and also as part of the analysis of the data gathered during the fieldwork, of course adjusted where needed according to the findings.

Justice	
How could (the use of) the HEIMDALL system affect the society we want to live in in terms of justice?	
"Disasters do not discriminate. […] But discrimination can multiply the effects of a crisis on vulnerable people" [7]. Therefore, in the case of an extreme event equal distribution of opportunities implies equal options to overcome a disaster with as little harm or loss as possible.	
1.	HEIMDALL plans to support disaster managers in a variety of situations produced by different hazards and/or extreme events via information of previous cases that is offered

		in a repository filled with past incidents. Therefore, it might be sensible to share experiences and operational protocols in order to give everyone the chance to benefit. - *Should operational protocols and decisions made be transparent and accessible to everyone in order to serve as learning opportunities even if they contain specific organisational data, wrong decisions or misbehaviour, and therefore, might have negative consequences for the involved organisations/personnel?*
2.		Individuals, groups or infrastructure are only recognised within planning procedures if there are perceived as potentially affected. This knowledge on the variety of potentially affected individuals/groups and areas is essential to allow authorities and relief organisations to plan and design measures that serve the whole of society. - *Should the HEIMDALL system encompass a database on potentially affected individuals/groups and areas as well as end-users' decisions based on previous scenarios and suggest this as a checklist for new planning procedures? (For instance: Did you think of elderly care centres, kindergartens, school, disability care facilities, …? or "Other end-users also checked for …")*
3.		The Sendai Framework for Disaster Risk Reduction [12] promotes an inclusive design of disaster policies in every aspect (prevention, reduction, response, recovery). Since the HEIMDALL system is a tool for a variety of organisations and users, and potentially works as an information tool for society as well, accessibility might be one way in which HEIMDALL could support this idea of an inclusive design. - *Should efforts be taken in order to have an accessible design in order to be usable by impaired personnel? And to what degree?*
4.		HEIMDALL strives to serve the greater good of society in terms of reducing harm resulting from extreme events. At the same time, countries, regions, provinces, municipalities, and organisations do not have the same resources to acquire up-to-date software solutions. - *Should HEIMDALL be a free tool or have a fair pricing system according to the resources and the risks affecting the potential buyers to avoid intensifying current inequalities between different European countries?*
5.		Every technology has side effects, which can either be positive or negative. In order to reduce the latter and prevent a technology from intensifying already existing disadvantages between people of different European countries, a variety of different positions and perspectives concerning the HEIMDALL system should be taken into account. - *Should the development of the HEIMDALL system encompass and take into account the ideas for and perspectives on the system from every member state of the European Union and even non-member states?*

Responsibility

How could (the use of) the HEIMDALL system affect the society we want to live in in terms of responsibility?

Responsibility as a concept describes the relation a person has to an action in terms of cause and consequence. Responsibility is composed of at least three different aspects, functional, role-related, and moral responsibility. The first one refers to the obligations that an agent has due to their actions and the consequences these have. For instance, person A is responsible for not pressing the button to send an early warning message. The second refers to obligations due to the role a person fulfils. In this case person B is responsible due to their position as the supervisor of person A. The third case refers to an obligation based on the value-system a person is part of or believes in. Person C might, for example, feel morally responsible due to the fact that they are not donating money to support

	the improvement of the disaster management in that country.
1.	Clear and well-known responsibility structures are important for legal as well as operational reasons. Although the HEIMDALL consortium decided against direct decision support in terms of presenting operational options or suggestions to the operational control, indirect decision support still has to be assessed. This includes the best matching scenarios tool and the presentation and selection of data. In terms of data, there is still the inevitable bias of the data source, where a preselection of the data is set and whereof the disaster response staff might select. - *Should the HEIMDALL system inform users on how the best matching scenarios were identified (variables, impact)?* - *Should the HEIMDALL system inform users on potential issues concerning presented data (source, date, missing information, quality)?*
2.	Due to the modular system of HEIMDALL it might be the case that information or functions are missing. - *Should there be an option to obtain modules that are needed in case the of an extreme event even if they were not previously bought?*
3.	With regard to technology, the question comes up whether and to what extent responsibility can be attributed to a technological system in different use cases. For the HEIMDALL project, responsibility is an important topic both with regard to acting and decision-making individuals as well as with regard to decision support by technology. - *Should the HEIMDALL system trigger an emergency situation on its own and if yes, on what grounds? Alternatively, which stakeholders are in charge?*
4.	Good disaster prevention or reduction is based on as much knowledge as possible because with knowledge comes the power to help people. However, only necessary and specific information should be taken into account to avoid data that will rather confuse, distract or be too sensitive. - *Should HEIMDALL provide technical solutions to counter information overload and "noise pollution" (information that can be described as noise) even if this means that data will be interpreted, hidden, and/or sorted?*
5.	The greater the agency is, the more responsibility is tied to it. The HEIMDALL system aims at the provision of a comprehensive set of data and tools to achieve a better disaster preparedness planning and disaster management. Therefore, users will have knowledge on how to improve current plans and measures, if necessary. - *Should and could the information, risk analysis, and best practices presented in the HEIMDALL system become a binding standard in order to improve current disaster planning and managing strategies of the EU countries?*
6.	If HEIMDALL offers modules that might detect weaknesses or needs for investment, public authorities might be reluctant to use the system. - *Should and could the use of the HEIMDALL system be binding in order to ensure equal security standards all over Europe?*
7.	Due to the diversification of digital communication channels, multiple questions arise about channels, forms, and contents of the messages to the public. The ethical discussion about communication often involves questions of truth telling in light of the possible benefits of paternalism. In this sense, there might be situations in which authorities decide not to communicate all facts to the public; or they exaggerate a threat scenario in order to gather support for counter measures or to more effectively tackle areas that, e.g., need to be evacuated.

	- *Should the HEIMDALL system encompass measures to counter misinformation? To what extent?*
8.	With the use of technology also the issue of assigning responsibility for mistakes or fail-ures arises. In terms of transparency and responsibility, it is not only a question of legality but also of design and implementation because there are options such as offline back-up systems, redundant servers, training of administrative IT experts for every user organisa-tion, and others. - *Should HEIMDALL or the provider of the HEIMDALL system be responsible for mistakes, wrong decisions or misbehaviour? To what extent?*

Trust

How could (the use of) the HEIMDALL system affect the society we want to live in in terms of trust?

Trust is the subjective belief in the credibility and authenticity of another individual or insti-tution. Even though it is predominantly seen as an individual and psychological phenome-non, trust can also be understood as a social value. For instance, the trustworthiness of institutions is a necessary condition for society as such. Confidence in reliable laws, rules, social principles as well as organisations and institutions is important for individual actions. Therefore, trust is a functional strategy to counteract the fact that it is impossible to check everything by oneself in order to act in a context of uncertainty.

1.	Studies ([1], [10], [11]) show that trust between individuals or organisations in disasters is heavily dependent on long term cooperation and face-to-face communication. - *What could HEIMDALL provide in terms of technical solutions, procedures or communication tools to help build trust and improve trustworthiness between or-ganisations and/or different users?*
2.	One way of assessing trust is based on the degree of transparency, which can include transparency of problems and mistakes as well as procedures in use. Because the final release of the HEIMDALL system and its demonstration cannot be completely flawless, discussing these errors and problems and allowing criticism are important for generating trust. - *How should the provider of the HEIMDALL system deal with problems and is-sues that might arise in the use of the HEIMDALL system (within the project life cycle as well as beyond)?*

Privacy

How could (the use of) the HEIMDALL system affect the society we want to live in in terms of privacy?

Data protection and privacy are among the most important issues to consider in terms of crisis management practices. Data is the backbone of crisis management, and therefore, the challenge is to develop information exchange tools (not only limited to crisis manage-ment) that enable data exchange without violating privacy and data protection. In other words, to present data in such a way that it does not lose its informational value but, at the same time, does not disclose personal details. Furthermore, it is important to focus on data security so that the information is being protected against unauthorised access.

1.	Data security means that the data that is gathered, exchanged, and used in crisis man-agement operations must be protected from unauthorised access. Although at first sight it might be considered only a technical question (encryption, password protection, physical integrity of server architecture, etc.), the issue arises when this information ends in the wrong hands. Thus, the question is whether HEIMDALL is secure enough to withstand external (and internal) attacks. - *What measures does HEIMDALL take to ensure data security?*

2.	Ann Cavoukian argues that "'Privacy by Design advances the view that the future of privacy cannot be assured solely by compliance with regulatory frameworks; rather, privacy assurance must ideally become an organization's default mode of operation" [2]. She proposes seven foundational principles of privacy by design that should be systematically taken into account, either when developing a technology or managing a company. In addition to data security, these principles mainly refer to minimising and anonymising data that is part of the system. - *What can be done to implement privacy by design in HEIMDALL?* - *Which strategies may be used, e.g. anonymisation, data minimisation, aggregation, etc.?*
3.	In [6] it is stated that HEIMDALL will provide applications to gather in-situ information. Even though these are not aiming at obtaining personal data, due to their design this data might be required in order to allow an appropriate management of the situation (e.g. allocation of personnel). - *To what extent does the HEIMDALL system need personal data?* - *Can the same goals be reached by using less or no personal data?*

3   The three focus groups

3.1   Methodology

3.1.1 **Introduction**

Following the description of societal acceptance and ethical acceptability presented in chapter 2, the objective of the empirical research is to evaluate the questions: "What are the attitudes, opinions, and values that the participants of the focus groups hold about the HEIMDALL system in its current state?" (descriptive knowledge on societal acceptance) and "How should HEIMDALL look like?" (normative knowledge on ethical acceptability).

Out of the five focus groups proposed in [5] to be carried out, three of them have already been conducted with members of the HEIMDALL consortium and their results are reported in this deliverable presenting them as either group 1, or group 2, or group 3.

The decision to include the perspectives of the consortium members into the sample of focus group discussions was also explicated in [5]. Observations conducted in previous HEIMDALL meetings showed that the members were having differing understanding of technical and ethical issues. Therefore, the intention has been to provide a close and private space for discussing these issues in detail.

Nevertheless, a necessary element for understanding the societal acceptance and for identifying aspects that should be considered regarding the ethical acceptability of HEIMDALL is the participation of other stakeholders such as citizens, representatives of interest groups, public officials, and politicians. Therefore, two focus group discussions will be carried out and reported in the third issue of this deliverable. Due to the type of participants in these discussions, it is very likely that they will not be involved in the development of a disaster response system and might not even have any knowledge about it. For this reason, the moderator of these focus groups will have to introduce HEIMDALL, its main functions and highlight the most relevant topics to discuss with the public. Naturally, the answers that might be obtained will be of a more intuitive type rather than based on experience or knowledge, which will be considered when the finding are evaluated and presented.

3.1.2 **Preparing, conducting, recording and evaluating the focus group discussions**

With the support of the project coordinator, the focus groups were carried out in the second half of February 2018 in Milan (Italy) during one of the HEIMDALL's project meetings. The number of participants per group was between 8 to 10 people who were actively involved and discussed about HEIMDALL for more than 1 hour and 20 minutes. Because the focus groups were conducted in English, which is not the mother tongue of many of the participants, this issue was considered throughout the development of the discussions, and afterwards, during the analysis and redaction of this deliverable.

The questioning route for moderating the groups included introductory questions that referred to personal opinions and ideas regarding an operational exercise that happened the day before the discussion. Then, leading to the main issues, some transition questions were asked and finally, the key questions produced a vivid and rich discussion (see Annex A: Focus Groups – questioning route). The moderators intervened only to introduce the questions, keep control of the debates, avoid digression from the main topics, and to stick to the time schedule.

Before the discussions started, the moderators briefly introduced themselves and the reasons for the focus groups, handed out two copies of the informed consent forms to each of the participants (see Annex B: Consent for Participation in Focus Group Discussions) and explained the need for recording the conversations. The moderators described the main rules within the discussions and the estimated duration. They provided basic information re-

garding their role as well as the importance of the participants' points of view. They stressed the idea that there were no *right or wrong* answers and that all participants had the same right to express their opinions. Also, the anonymity of the participants and the confidentiality of the analysis was guaranteed. Finally, participants had the opportunity to put forward any doubts about the discussions and the Informed Consent Forms. Afterwards, they signed the forms to verify their voluntary decision to be part of the discussions and their understanding of the reasons and rules stated in the forms. Once this last step was concluded the discussions started.

Subsequently, the recorded conversations were stored in an encrypted container and transcribed by members of EKUT. Due to the decision to anonymise, the transcripts are free of any personal or identifying information including potential names unintentionally mentioned during the discussions. The transcripts were evaluated following the descriptive-reductive content analysis method (see [8]:183 et seq.) with the objective of summarising the main topics and arguments of the debates, reducing the data volume but increasing the amount of information. To avoid a potential subjective influence of the researchers on the results, all members of the EKUT team prepared their own analysis on all three focus groups which were then compared to produce a single consolidated evaluation. The selected themes and the corresponding relevant quotes to illustrate them will be presented in the following section.

4 Main findings

At the time these focus groups were carried out, HEIMDALL was still at a very early stage of development. Because, as it was previously explained, time and development affect the evaluation of the societal acceptance of the system, it was agreed that firstly there was a need for identifying visions, reasons, interests and concerns that each group had about HEIMDALL and to discuss these findings with the other participants. The objective has been to recognise the different perspectives, values and intentions behind the development of this system, and to debate and agree on the value of those different understandings in terms of social and ethical acceptance. Once a solid image on the system has been achieved the remaining focus groups will be conducted to evaluate the public acceptance of the HEIMDALL system as well as the potential different perspectives on its ethical acceptability.

4.1 Visions of HEIMDALL

After the introductory questions, the first topic that was discussed related to HEIMDALL, considered the transition question, was the vision or the understanding that each participant had about the system. Hence, the question was directed towards identifying shared or diverging ideas of the system, which have been summarised in three intertwined perspectives.

4.1.1 Saving more lives and identifying blind spots

Firstly, all participants considered HEIMDALL a tool to support first responders and improve the chances to save more lives and to reduce damage and destruction of infrastructure. In this regard, some of the functionalities of HEIMDALL include the assessment of current developments and the provision of simulations or "*what if?*" analysis, which are viewed by members of group 1 as offering new options for unveiling things that might not be seen at a critical moment, or in the words of members of group 2, "as explaining better what might happen". In that sense, group 3 suggested that they are good tools for politicians in terms of justifying strategic decisions.

In addition, the agreement among all the groups was that to improve the work of the end-users HEIMDALL should be a tool for covering all phases of the disaster management cycle and not simply the crisis stage. In this sense, participants in group 3 emphasised the value of the system for preparedness planning, including preventing and reducing risks, instead of focusing only on the response phase. Similarly, another group highlighted the system's value as giving the technical partners of the consortium the opportunity to develop new products that answer the needs of the end-users in other moments rather than focusing only on the crisis phase.

In terms of analysing the ethical acceptability, this strongly relates to justice and responsibility as values, and to the quest for reducing negative side effects. In order to save more lives and diminish damage to infrastructure, HEIMDALL should provide options to remind the end-users of potential blind spots. This might be done by checklists, reminders, best practises, warnings as well as by having reliable and complex simulations that consider and indicate the consequences of e.g. rising levels of a river on affected areas and groups.

4.1.2 Improving the available data and reducing the "noise"

Another important point is that HEIMDALL is also understood as a tool that provides a more comprehensive set of information about an incident. "(Q)uestions like when, why, where, and how could be answered by this platform" as well as how it will develop, and what the possible counter measures are. This vision of HEIMDALL encompasses how the system can improve the informational situation for crisis management and the outcomes.

In contrast to the idea of gathering and providing more information, the task of "unloading the cognitive load" and "filtering information" was also mentioned during the discussions. Participants in group 3 explained the value of filtering as reducing the noise and obtaining the in-

formation for a specific point in time within the decision-making process. Nevertheless, filtering information was considered a very sensitive issue by members of group 1. As such, the objective for the system is to provide support to the strategic level and to offer filters for those using HEIMDALL to decide on the need and manually adjust the importance of the information or its aggregation.

In addition, participants in group 2 mentioned that HEIMDALL can also be a tool for informing society from two different perspectives. On the one hand, it can transmit information to society during a response phase, and on the other hand, it can be a useful source of information in the aftermath of a crisis to improve future crises mitigations and also to hold accountable those involved.

In this case, a tension can be observed between, on the one hand, the vision of providing as much and as detailed information as possible via the HEIMDALL system and, on the other, the idea to create a system that filters, prioritises and weighs information. This tension has to be addressed in the further design of HEIMDALL in order to address also the problems that come with these ideas, i.e. (in)direct decision support, data protection, misuse of data or also biases and unwanted influence by the system via data prioritisation.

4.1.3 Strengthening standardisation and cooperation

A third topic to highlight is the idea that HEIMDALL can contribute to improving standardisation and cooperation among European disaster management agencies. All groups mentioned that HEIMDALL can be a tool for storing lessons learnt and for training, or for using these lessons learnt as input for evaluating possible options in real disaster situations.

However, members of group 3 presented some concerns regarding HEIMDALL as a tool for integrating all existing systems and procedures as well as improving them. In this sense, the ambivalence of a project that proposes a tool for 28 EU countries with different disaster management systems was obvious to them. "We have not the same system. […] It's similar, but it's not quite the same. So how can you build a system that takes care of that and then you have to use it in 27, 26 European countries in the future?". They are hoping for a system that standardises the work of these different disaster management structures while at the same time asking themselves how to technically achieve this objective.

In particular, the emphasis that participants in group 3 put on the value of HEIMDALL is based on the option of sharing the same picture of the scene, either by cross-organisational, cross-level or cross-country cooperation. Currently, it was explained, only the military cooperates on an international level, while countries have to resort to their own capacity when facing an *internal* crisis due to natural disasters. They saw in this tool an easy way to communicate with other disaster management services outside of their own area and/or country, and also as a system that reduces the time to transfer information between command and control (C&C) and the field, or between different command levels. In other words, as a tool that improves information management (internal and external), cooperation among organisations in crisis situations, and teamwork.

Cooperating in terms of sharing data was a topic touched upon in all the focus group discussions, particularly referring to data on critical infrastructure, which is not available due to different mandates or classified information. HEIMDALL states that communicating, and sharing are key aspects of the platform and will provide tools for these, which are currently being developed. In this regard and in order to improving this cooperation and sharing, the consortium should also discuss potential ways to raise the willingness to share, e.g. by addressing the question of trust between different organisations and providing tools for standardisation.

4.2 HEIMDALL is a multidisciplinary project

Coming from different starting points, working together is not always easy. Therefore, it is not much of a surprise that the development process itself became a topic that was touched upon in the discussions. At some point in time, all participants reflected on the difficulties of working together as a consortium, due to different backgrounds, profiles, languages, expec-

tations, and interests. As they explained, and it has been seen in many multidisciplinary developments, there seems to be a gap between the perspectives of end-users, academics, and developers. These differences become visible not only in levels of abstraction, language or technical details but even more important, in determining the aim for the system itself.

As previously mentioned, the acceptance of a socio-technical system is a matter of time and development, power and its distribution. Consequently, it is expected that internal differences and disagreements about time, professional backgrounds, languages, and expectations will be present during the development of this technology, but also settled through the different releases.

Evidently, this is an issue that has been affecting HEIMDALL and that will remain present during the whole duration of the project. However, it is also important to emphasise that this is an issue that has not been overlooked and has been discussed outside of the safe space of the focus groups, e.g. during project meetings. In order to reduce this gap and increase the understanding among all members, efforts have been made such as ad-hoc meetings and workshops, additional phone conferences, and interviews with end-users. In addition, further discussion addressing this issue will take place during the next project meeting. Therefore, this process of monitoring and discussing issues is an ongoing task.

4.3 Commercialisation

Placing HEIMDALL in the market was another discussed topic.

4.3.1 **Prototype vs. ready to use**

Some participants considered the system as a first step: "we see this project as a development phase to, let´s say, go further so that in a few years we are able to deliver what they [the end-users] want". Therefore, the participants were aware of the difficulties of placing the system on the market. Additionally, they acknowledged that there is the problem that HEIMDALL might be developed but not used.

In contrast, other participants stated their concern regarding promoting the platform as a final product. They considered it as their *responsibility* to help promote the final product. They explained that they can recommend it to their colleagues who are expected to trust in HEIMDALL because they know each other and know that known colleagues have been involved in the development. To this end, however, these participants argued the end-users also have the *responsibility* to explain to the developers what they expect, what they need, and what they want.

Therefore, the diversity of backgrounds, professional commitments, and interests also affects the opportunities for turning HEIMDALL into an economically viable product. The business plan has to balance the different interests of the public and private organisations that are part of the consortium and take into account that some members of the consortium are willing to promote the system because they know the value of trust in the context of end-user organisations.

Based on the work being done on commercialisation in WP7, the opinions just presented highlight the importance of continuing with the efforts being made to develop a business plan that ensures the financial success of the system. and promotes its societal acceptance.

4.3.2 **Fair pricing**

Thus, the business plan is seen as the main instrument to include the diversity of interests present in the consortium. As such, the business plan has to integrate every technology produced and knowledge acquired in such a way that the value is transferred to the corresponding partner when they are offered on the market. However, neither does every partner has the same legal status nor are they located in the same country, which makes the task of preparing a business plan very complex. Whereas some participants argued that they do not have any economic interest but are focused on improving the transmission of information to

end-users having no or little access to data, other participants stated that every sub-product contributes to the security of society and can be a source of revenue for their institutions.

Furthermore, a tool such as HEIMDALL that proposes to improve preparedness of society to face complex crisis situations questions the argument of financial profits in terms of justice. Can the system be considered socially accepted if societies cannot afford to pay for it? According to the comments made during the focus group discussions and the interviews reported in [4], end-users expect HEIMDALL to be a platform that supports exchange and cooperation efforts within the European disaster management community (see also 4.1.3). Against this backdrop, a reasonable suggestion is to consider pricing models that allow a large number of people and organisations to use the HEIMDALL system.

4.4 Decision Support

In terms of the extent to which HEIMDALL should support the work of the first responders opinions also diverged.

4.4.1 **Filtering data: noise reduction vs. influencing decisions**

One topic that emerged throughout the discussions was the diverging opinions regarding filtering data. Although this topic was already mentioned above (4.1.2) it should also be considered with regard to decision support.

In one of the groups participants argued that they see it as their *responsibility* to provide valuable information. In their understanding, during a response phase end-users receive too much information and once they have access to HEIMDALL it might overwhelm them. To counter this and to allow for making good decisions, members of this group proposed a decision support tool for end-users. According to them, this feature would include filter mechanisms that evaluate and suggest the *best* options. Nevertheless, they expressed their awareness in terms of the end-users' opinion, as they mentioned that "end-users are afraid of the system making decisions".

On the other hand, members of another group repeatedly insisted on a system that "has to present information, but it has to present information with no weighing and no preference". These participants presented several arguments questioning this feature. One of them was that many of the decisions are made in the field where connectivity is limited, information is poor, and delays in making decisions are critical. "If HEIMDALL is slow, people will decide on their own."

This was not only touched upon during the focus groups but also during phone conferences and project meetings. The compromise achieved by the consortium addressing this issue so far has been to offer to the users data filters that can be used to select the level of detail or aggregation of the information. This aligns with legal considerations regarding liability, since it promotes an actor (the user) that based on previous training adjusts the system to their informational needs. Consequently, what might be or not taken into account is a result of a conscious decision.

With regard to ethical acceptability, this idea should be accompanied by a training strategy and a warning or approval mechanism (by responsible personnel) that, on the one hand, enables the user to make an informed decision and, on the other, introduces a safety net. Based on the outcome of the interviews already carried out (see [4]) these adjustments should be decided by every organisation and where possible at a local level.

4.4.2 **End-users trust people, not systems**

A second argument provided during the discussions was that even if a decision is made based on the suggestions given by HEIMDALL, this would be a decision made away from the field. According to the participants, teamwork depends on personal relationships, on whether they know each other because "this relationship is between persons, not machines or plat-

forms". As such, a decision made away from the incident will not be reliable, and therefore, not being followed.

Supporting these statements, members of other groups stated that HEIMDALL is a tool that has its greatest value at the strategic level. As explained in section 4.1, it provides and filters information and facilitates the exchange and communication. Decisions, however, are taken at the tactical level. Therefore, HEIMDALL might reduce mistakes, but it cannot prevent them from happening. In their opinion, civil protection personnel rely on their expertise rather than on other decision-making methods.

In this sense, as stated in subsection 4.1.3 and aiming at a socially acceptable system, the emphasis should be on supporting current responsibility structures and working for better communication and cooperation via generating trust in the system and the people working with it.

4.5 Trusting in HEIMDALL

4.5.1 Trust during a crisis

Following the idea that first responders trust in people rather than technology, one of the participants stated that "[the] first time it [HEIMDALL] fails in an incident in the field no one will use it and everyone will go back to other procedures". In other words, if the system technically fails or provides information or proposals for actions that are either interfering or turning against the first responders, the system will be disregarded. In this vein, the readiness of the tool is a key aspect for the acceptance and use of HEIMDALL (see also 4.3.1).

Complementing this perspective, members of one of the groups mentioned that end-users have to know and understand the limits of the system. Their comments were a reaction to the episode of January 2018 when a false alarm on a ballistic missile coming to Hawaii produced panic among the Hawaiian population. In terms of HEIMDALL, society will trust in the system because "it's not in HEIMDALL but in the decision-makers [authorities]; the system is a tool, so it can't stop the decision-maker from making a decision". With regard to transparency, it might improve the trust in the authorities and the system because it displays who (which authority) made a decision rather than making the decision and deciding which information to present to the population.

Working towards the societal acceptance of HEIMDALL, the focus should be on the readiness of the system as fixing or changing it during an emergency is not possible. As this problem was acknowledged and discussed during project meetings, currently all members of the consortium are actively embracing this idea and working together with the end-users to get closer to their requirements by each release. In addition, to gain the end-users' confidence and trust in the system they have been given access and time to use it. However, it has been accepted that adapting the system to each end-user organisation in order tailor it to the expectation is not included in the current project life.

Therefore, as previously explained during the Commercialisation and Decision Support subsections, the system has to provide some added-value that can be offered by the end-users who are part of the consortium to those in their field of work since trust is a personal matter. Expectations and reality have to match in order to transfer the trust they have in personal contacts to a technical system, or like one of the participants put it "that added value is the ability to see beyond what we can see at the moment. This is where trust will come from".

Additionally, in terms of responsibility considering options for future development or the business plan such as, back-up systems, redundant servers, training of end-users and administrative IT experts can also be seen as aspect for improving its ethical acceptability.

4.5.2 Trusting the data that HEIMDALL offers

Following the arguments of the three focus groups discussions, data is another key aspect for the acceptance of HEIMDALL. According to members of one of the groups, more or better

data is a reason for the end-users to trust in HEIMDALL. Trust in the data and information provided via the system is expected because it was generated following known and tested processes and from known sources, including other end-user organisations.

To this idea, participants in group 2 added that end-users would feed the system with their own information, and therefore, end-users will trust in HEIMDALL because they trust their own information. In this sense, tacit knowledge will also be collected in the system and made available via the lessons learnt functionality.

Moreover, HEIMDALL is understood as a tool for training, and following the ideas of some of the participants, exercising with the system will generate confidence in it. As one of them stated it, "it's not only a technological platform, it sums up the knowledge of different actors".

Furthermore, the user interface will be the place where all the data gathered can be seen, compiling information that comes from internal and external sources and reducing the need for searching for other details.

On the other hand, repeating what was previously expressed, other participants considered that trust in the system also depends on presenting the data and the information without preferences so that decisions can be based on facts, i.e. on information that is as little biased as possible.

In order to facilitate a positive attitude towards the system and referencing subsection 4.1.2 and 4.4.1, to indicate the source of the data and/or the parameters involved in the best matching scenarios tool could be an option for improving trust in the data and HEIMDALL, and simultaneously reducing possibilities for misuse or badly influencing decisions.

4.6 Data privacy and security

Finally, when questioned about any privacy or security issues that were worrying them, each group focused on a different aspect on these topics.

4.6.1 **Data privacy**

The members of group 1 centred their answers around privacy and the differences between the public and the end-users. Firstly, they held that HEIMDALL as such does not share data with anyone. Referring to technical measures and accepted tools by the IT security community, the system should be fairly safe against security breaches. "(I)t's only the authorised people [who] are going to be able to have access to the application and that is why you are going to define some roles and assign users to these roles, and the roles are going to have specific access rights, and [the system is going to have] end-user state of the art tools for access control and role management". However, they also raised the question of "what are the private things the users are going to share? That have to be, let´s say, protected". The answer they found was that end-users will only have a user account and not an admin account. When in the field, they may share their location to the command and control centre (C&C) through HEIMDALL but only after having accepted the privacy policy, and therefore, consenting to it. In addition, the app as a communication tool can send photos, audio or other type of information to the C&C and receive a limited amount of information. In sum, they did not see much in terms of privacy of the end-users that could be affected.

On the other hand, regarding the public, after some exchange and better definition of the requirement related to the development of an app for the population, the answer was that the citizens' app is understood as a one-way communication: only to send alerts, not a crowdsourcing app. It will not require a user's location to function and will be used anonymously. They explicitly stated that this functionality it is not expected to challenge 112, the official line to call for an emergency. The crowdsourcing if implemented will be used in order to gather more information about the incident or validate an already acknowledged emergen-

cy and it might be based on VOST[1]. Nevertheless, the consensus among the members was that to develop a crowdsourcing app was beyond the resources of HEIMDALL. In other words, the citizens' privacy was also evaluated as not at risk.

Members of group 2, on the other hand, had a different perspective. They evaluated the question and answered that at a societal level problems might arise. "Currently thinking about drones, about the pictures that could have been taken by drones, what will happen with them?" The question evidently pointed towards the ownership of the data, access levels, and re-use of the data after an emergency. "I see that as a society, the people could be a little bit reluctant if they know that there are machines taking pictures at their places. That could be a problem. I mean from the database perspective I guess that this could be removed". In other words, they identified a potential element that could negatively affect the acceptance of HEIMDALL.

Moreover, these concerns highlighted that there are problems that go beyond technical expertise and decisions, issues that at this point in time the consortium had not thought about and did not have an answer. They mentioned that these data can be used after a crisis to judge the behaviour and decisions of those involved and, therefore, can be legally used for assigning the responsibility in a trial. In the same vein, lessons learnt can be used as a proof in a trial adjudicating responsibilities for mistakes made during an emergency.

Furthermore, participants in group 1 also mentioned their concerns regarding the misuse of the simulators from actors other than the end-users. Although initially worried about the potential impact of the flood simulator depending on the level of detail of its output, exchange among them revealed that insurance companies in the property sector already have better tools. Likewise, health insurance companies could profit from information gathered through the impact and vulnerability assessment tools identifying vulnerable groups such as those with chronic conditions or limited mobility. Also, politicians could use the information provided to better define the use of land and urban planning or assigning extra funds to the end-users.

However, the interviewers interrupted the conversation during this exchange to state that these use cases not originally foreseen might be understood as a *"function creep"*, a concept related to the "subsequent novel uses [that] are devised for existing technical systems, which are added to the original panoply of functions [9]". Then, a functionality or module of HEIMDALL designed for a specific case is transferred to a different context with different norms and regulations, with the logical potential negative consequences of this shift. To this point, the answers were not clearly acknowledging the risk and it was reconfigured as a matter of the business plan and the decision-makers. On the one hand, the problem was identified as how to reconcile all the partners' interests. Members of group 1 were concerned with whether these further uses can be additional sources of revenue, and whether the consortium can define the uses of the tools developed or the partners can identify other purposes for the services. On the other hand, the misuse or novel uses were also addressed as a responsibility of the decision-makers. If the end-users were offering the information that HEIMDALL produces to third-parties, consequences have to be faced by the respective end-user organisation, not the whole consortium. "But in the end, it depends on the decision-maker […] how he uses the data. We provide the data, but it is on him".

Finally, participants in group 3 manifested that from their perspective existing laws and EU regulations together with privacy and security measures currently adopted for developing software provide enough guarantees. Nevertheless, their worry was on the security aspect.

In sum, an ethically and socially acceptable system should provide an answer to the various questions posed during this section: privacy and security standards of the system, social

---

[1] The Virtual Operations Support Teams, a network of volunteers able to support emergency services online in case of a crisis using communication technologies and social media tools to validate the data generated during an emergency.

media validated data integration, ownership of data, and function creep. Current crisis management incidents have produced sufficient evidence on the need for using social media data providing the necessary assurances regarding their validity, veracity, and confidence. More importantly, HEIMDALL should provide a clear definition in terms of ownership of data as well as procedures to ensure accessibility levels. In addition, security measures should be adopted to avoid misuses, especially in case of potential function creep or data breaches. This concept should be further discussed by the consortium to ensure its understanding and risks as well as the execution of the necessary actions to prevent potential misuses and injustices.

4.6.2 Data security

As just stated, participants in group 3 expressed that their main concern is the security of the platform. They mentioned two different but intertwined aspects of the classified information. One case is sensitive information, for example plans for terrorist attacks that are part of the end-users organisation's system repository, which can be accessed by other end-users organisations. In this case, the fear is that access is granted or gained and, therefore, information that should not be shared, it is shared.

On the other hand, their second worry is that of critical infrastructure. According to them, "critical infrastructure isn't something that's even shared in the same country with emergency partners, never mind with anybody else. And often critical infrastructure is not owned by the state". Therefore, critical infrastructure is secret, access might not be granted, or it can be in the hands of private companies and will not be provided. They acknowledged that the systems where this information is as well as the same critical infrastructures can be affected during a crisis and that not accessing them affects negatively the work of the end-users. However, they insisted on security reasons such as cyberattacks to deny the information.

In this vein, in terms of acceptance a better work shall be done to communicate to the end-users the measures taken to avoid such potential security breaches. In addition, to have a clear answer to the questions posed in terms of ownership of data and function creep will also contribute to improve the HEIMDALL's security. As previously stated, the discussion and adoption of necessary security measures will contribute to prevent potential misuses and injustices.

5 Conclusion and Recommendations

This deliverable provided an overview of the work that has been carried out until now in terms of empirically assessing the societal acceptance of HEIMDALL as well as the different perspectives involved in developing an ethically acceptable system.

It presented a summary of the theoretical aspects of societal acceptance and ethical acceptability, which were thoroughly analysed in [5], including definitions of these concepts and four values to be considered during the study of the data gathered in the field: justice, responsibility, trust, and privacy. Additionally, it included a brief explanation of the methods used for empirically gathering data, the focus groups, as well as their subsequent analysis to assess the acceptance of HEIMDALL.

Finally, it presented the main findings of the thee focus groups already conducted as well as their analysis. In this sense, six mayor themes were identified by means of the descriptive-reductive content analysis method: different visions of HEIMDALL; working on the development of the system in a multidisciplinary team; commercialisation of HEIMDALL; decision-support tool; trust in the system; as well as data privacy and security. Although issues on their own, these topics are also intertwined with each other and the assessment continuously referenced these other points in order to clarify their meaning and importance.

In terms of recommendations, and based on the analysis done, there are a number of points to consider. All the participants acknowledged the importance of HEIMDALL in terms of its final objective, helping to save more lives and reduce harm and damages. References to the opportunities that provides for identifying blind sports and offering tools to end-users for working with the system also during the preparedness phase as well as strengthening cooperation and standardisation in the European Union emphasised the added value that the system provides. However, some tensions and difficulties have been recognised during the study of the empirical data that highlight the importance of addressing these issues.

Firstly, ensuring the acceptance of the system by the end-users implies bridging the understanding gap between technical profiles and end-users profiles. Although much work has been done in this sense, this is an ongoing challenge that should not be considered as resolved until the end of the project.

Secondly, commercialising the system requires a business plan that takes into consideration the multiple interests and objectives of the project partners as well as economic and environmental differences among EU countries.

Thirdly, providing valuable data, unloading the cognitive load, filtering information and offering best options are ideas that are in tension. Achieving a balance between presenting the most important data and influencing a decision are necessary conditions for an ethically acceptable system. In this sense, HEIMDALL should support current responsibilities structures and improve the cooperation among first responder organisations.

Connected to the previous point, in the disaster management field trust is a value based on the face-to-face interaction and previous experiences of working together. Developing a system that adds value to this cooperation via better communication tools, sharing of the operational picture, and distribution of data and lessons learnt could be key elements to secure the societal acceptance of HEIMDALL.

Furthermore, a positive opinion of society towards the system is also based on ensuring the quality, veracity and confidence in the data that HEIMDALL offers, thereby preventing badly influenced decisions. Efforts should be made in terms of indicating the sources of data, especially in case of referring to social media, the parameters involved in tools related to decision support such as best matching scenarios, and privacy protection. In this sense, answering the questions related to the ownership and use of the data as well as the actions taken to avoid a potential function creep are vital points for societal acceptance and to hinder the generation/reinforcement of injustices.

Lastly, trust in the system is also a matter of the security measures that HEIMDALL adopts in terms of roles and access levels and related to guarantee that no data breaches and/or potential misuses of the data may happen that, as previously mentioned, create/reinforce injustices.

6 References

[1]   Maja Apelt: "Organisationen des Notfalls und der Rettung - eine Einführung aus orga-
       nisationssoziologischer Perspektive" in Organisationen und Experten des Notfalls: Zum
       Wandel von Technik und Kultur bei Feuerwehr und Rettungsdiensten, Jenki, M., Elle-
       brecht, N. and Kaufmann, S. (Eds.) (2014). Berlin: Lit VS, 69–84.

[2]   Ann Cavoukian, Scott Taylor and Martin E. Abrams: "Privacy by Design: essential for
       organizational accountability and strong business practices" (2010). Identity in the In-
       formation Society 2(3):405–413.

[3]   HEIMDALL Deliverable D3.8: Analysis of Human Factor Involvement in the use of Au-
       tonomous Systems in DRR and Response and Specifications for User Requirements –
       Issue 1.

[4]   HEIMDALL Deliverable D3.9: Analysis of Human Factor Involvement in the use of Au-
       tonomous Systems in DRR and Response and Specifications for User Requirements –
       Issue 2.

[5]   HEIMDALL Deliverable D3.11: Analysis of Societal Acceptance and Ethical Acceptabil-
       ity – Issue 1.

[6]   HEIMDALL Grant Agreement No. 740689.

[7]   International Federation of Red Cross and Red Crescent Societies: World Disasters
       Report 2007: Focus on Discrimination (2007). Satigny/Vernier, Switzerland: ATAR Roto
       Presse.

[8]   Siegfried Lamnek: Gruppendiskussion (2005). Theorie und Praxis. Weinheim: Beltz.

[9]   David Lyon: "The border is everywhere: ID cards, surveillance and the other" in Global
       surveillance and policing, Salter, M. B. and Zureik, E. (Eds.) (2005). Cullompton: Wil-
       lan, 66-82.

[10]   Paul Slovic: "Perceived Risk, Trust, and Democracy" (1993). Risk Analysis 13(6): 675–
       682.

[11]   Stefan Strohschneider: "Technisierungstrategien und der Human Factor", in Zivile Si-
       cherheit: Gesellschaftliche Dimensionen gegenwärtiger Sicherheitspolitiken, Zoche, P.
       (Ed.) (2011). Transcript: Bielefeld, 161–177.

[12]   United Nations Office for Disaster Risk Reduction: Sendai Framework for Disaster Risk
       Reduction   2015-2030   (2015),   available   at:
       https://www.unisdr.org/files/43291_sendaiframeworkfordrren.pdf. [Last accessed in Ju-
       ly 2017].

[13]   Paul Upham, Christian Oltra and Álex Boso: "Towards a cross-paradigmatic framework
       of the social acceptance of energy systems" (2015). Energy Research & Social Sci-
       ence 8:100-112.

[14]   Andreas Wolkenstein: "Akzeptanz und Akzeptabilität im Kontext der Angewandten
       Ethik" in Sicherheitsethik, Ammicht Quinn, R. (Ed.) (2014). Wiesbaden: Springer VS,
       225–239.

Annex A: Focus Groups – questioning route

I. General introduction

What is the idea of doing focus group discussions with the HEIMDALL consortium?

- We want to learn more about your (individual and common) thoughts, attitudes and opinions towards possible social and ethical aspects related to the development and the use of the HEIMDALL system.

- The aim of the discussion is to actively incorporate you and your perspectives into the development of HEIMDALL (in order to improve the product, to avoid foreseeable problems or conflicts). A better understanding of your perspectives will also help us to detect relevant aspects for the evaluation of social acceptance and ethical acceptability in the case of HEIMDALL.

Information about operational aspects

- The idea is to have an open discussion. In order to start the discussion, we prepared some questions. You are invited to raise additional questions or comments that come to your mind.

- We will ask you to express your experiences, feelings, thoughts, opinions and doubts towards some aspects related to the social and ethical implications of HEIMDALL

- Answers and comments do NOT have to be scientific; THERE ARE NO WRONG ANSWERS!

- Your contributions will not be shared with the public or the other consortium members. ("What is expressed in the discussion remains within the group").

- The discussions will be recorded. The audio-files will be processed only by members of EKUT.

- The content of the discussions will be summed up and anonymised in the transcription process and no attribution to individuals will be included; the audio files will be deleted right after the transcription.

  ➢ See informed consent sheet; Please read carefully and sign it.

- The duration of the discussion will be max. 90 minutes (including this introduction).

- We want to kindly ask you to switch off your mobile phones and other electronic devices or put them away.

- In order to have smaller groups and to provide better conditions for the discussion to all of you, we will divide you in three groups. The idea is to have three separate discussions about the same topics.

II.   Questions
"Wake-up"-question

1. *Which situation of the yesterday exercise was the most important or interesting for you, and why?*

Introductory question (to understand the participants' notion of the system and their work)

2. *What is your personal vision of the HEIMDALL platform? / What do you want to get out of HEIMDALL?*

Key questions

3. *In your opinion, what could be the most crucial points with regard to the interaction of humans and the HEIMDALL system?*

4. *Where do you see your responsibility in making HEIMDALL a valuable product for disaster management and society?*

5. *Why should people trust in HEIMDALL? I.e. Hawaii*

   a. *[Why should end-users trust in HEIMDALL?]*
   b. *What could quality of information in the context of HEIMDALL mean for you?*

6. *Are there any privacy or security aspects you worry about and why?*
   - e.g. concerning the app, hacking, tracking…

Optional questions (in case there is time left)

7. What do you think of the current business plan proposal offering different versions of HEIMDALL according to the customer's budget?
   (What are your thoughts towards the business plan, especially that it is planned to create different levels of functionality, which end-users can order depending on their budget?)

8. *Where do you see valuable contributions of the HEIMDALL decision sup-port for disaster management, where not?*
   - What effect could it have (on human responsibility)?
   - How could the system propose actions or options in the best way?

9. With regard to the accessibility and usability of HEIMDALL: Who should be able to access what kind of information?
   - Accessibility in terms of confidentiality and disability
   - Should there be restricted information for certain groups? Why?

Closing question:
10. *Are there any other topics related to ethical or social issues you would like to talk about?*

III.   Summary
11. *From your point of view, what were the most important points of this dis-cussion? Where did you see moments of consensus and/or controversy within the debate?*
    - The moderator/s close/s the discussion.

Annex B: Consent for Participation in Focus Group Discussions

I volunteer to participate in the empirical research of the project HEIMDALL, funded by the European Commission (HORIZON 2020, Grant no. 740689). Task 3.4 is led by Prof. Dr. Regina Ammicht Quinn, International Centre for Ethics in Science and Humanities (IZEW) University of Tübingen (Principal Investigator). I am part of the consortium and therefore informed about the project. I understand that Task 3.4 of HEIMDALL is designed to gather information about human factors, as well as ethical and societal issues in transnational crisis management by means of an integrated platform.

- My participation in this discussion is voluntary. I understand that I will not be paid for my participation. I may withdraw and discontinue participation at any time or refuse participation a priori without penalty or any other consequences.

- I understand that I have the right to decline to answer any question or to leave the discussion at any point in time.

- The focus group discussion will last approximately 70–90 minutes. An audio tape of the discussion, and subsequently a transcript, will be made.

- I understand that I will not be identified by name in any reports using information obtained from this focus group discussion, and that my confidentiality as a participant in this study will remain secure. The processing of my personal data will be subject to standard data protection policies.

- Any obtained information will be used exclusively in the context of the research. In an anonymised fashion, quotes or parts from the focus group discussion can be part of scientific publications.

- Only researchers from Task 3.4 will have access to the audio file. The audio file will be stored in an encrypted container and it will be deleted after the transcription. The anonymised transcript may be shared with the project consortium.

- I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study.

- I have been given a copy of this consent form.

_____   _____
Date   Printed name (participant)

_____   _____
Signature (lead of T3.4)   Signature (participant)

For further information, please contact:
Prof. Dr Regina Ammicht Quinn
regina.ammicht-quinn@uni-tuebingen.de
+49 7071 29-77983

End of document