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PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
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1 INTRODUCTION

1.1 PROJECT SCOPE

The CHORIST project will propose solutions to increase rapidity and effectiveness of interventions following natural hazards and industrial accidents, in order to enhance citizens' safety and communications between rescue actors.

1.2 PURPOSE OF THE DOCUMENT

This document provides the methodology to assess the results of the project in terms of the actual achievements or not of the Developed System and the Target System towards their respective goals. It concludes by a set of recommendations for the future of each of these systems.

1.3 DOCUMENT VERSIONS SHEET

Version	Date	Description, modifications, authors
1.0.1	13/11/08	First release based on SP5.D3 V1.0 - section 5.2.1.1 added - section 5.2.1.2 modified
1.0.2	12/12/08	Minor modification by EENA.
1.0.3	16/02/09	Questionnaires added by BAPO and EENA
1.0	11/03/09	Finalisation

Table 1 : Document versions sheet

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2 REFERENCE DOCUMENTS, DEFINITIONS AND ABBREVIATIONS

2.1 REFERENCE DOCUMENTS

- [1] CHORIST SP1.D4 - Report on user requirements and initial supporting cases
- [2] CHORIST SP1.D8 - System architecture
- [3] CHORIST SP1.D10 - Yearly progress report on UAB activities - year 2
- [4] CHORIST SP0.D18 - Report on impacts analysis - Year 2
- [5] CHORIST SP5.D9 - Report on system assessment and recommendations for further work
- [6] CHORIST SP0.D28 - Report on impacts analysis - year 3
- [7] CHORIST SP5.D3 - Report on demonstration assessment methodology (preliminary version)

2.2 DEFINITIONS

Demonstration	A two-day show of the CHORIST outcomes and benefits to public safety decision-makers, industrials and universities.
Developed System	A first level of operational capability of the Target System developed within the CHORIST project (3 years).
Impact Assessment	The processes of analysing, monitoring and managing the (intended and unintended) social, biophysical and economical consequences (both positive and negative) of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions. its primary purpose is to bring about a more sustainable and equitable biophysical and human environment.
Presentation	The presentation of a part of an SP, of one SP or of several SPs to any partner, external entity... anywhere and when possible. It is made to get feedback from users on the design, and also to start to assess the system.
Target System	The long term vision of CHORIST, without any technical or financial feasibility constraint. This Target System gives the long term vision of what should be achieved to fulfil all the users requirements.
Trial	One or two weeks of tests made with end users to assess the CHORIST system as a whole or the subsystems separately.
UAB	The User Advisory Board is a set of external representatives of the authorities, technologies experts and citizens who provide (1) feedbacks on the development carried out in the CHORIST project, and (2) assessments on the projects actual results.
Vulnerability	Evaluates the protection of the system against external attacks and events.

2.3 ABBREVIATIONS

DAB	Digital Audio Broadcast
DVB	Digital Video Broadcast
GSM	Global System for Mobile communications

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ICT Information and Communications Technologies
NATO North Atlantic Treaty Organisation
SP Sub Project
TSO Tactical Situation Object
UAB Users Advisory Board
WBS Work Breakdown Structure

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3 EXECUTIVE SUMMARY

- System assessment:

At the end of the 3-year timeframe of the CHORIST project starting in June 2006 and ending in May 2009, the CHORIST consortium will provide a system made of three relatively independent prototypes. These prototypes are on the other hand built on top of existing building blocks by industrial and researchers. The building blocks follow end-user requirements know by each partner of the project in their own context, and the evolutions have been made in the frame of CHORIST which is related to the early warning of natural hazards and industrial disasters.

The prototype - a.k.a. the Developed System - is intended to be the first step of a concept, which will require more efforts and time: The Target System. The Demonstrated System consists of the prototypes presented at the end of the project; the Target System consists of a network of systems using the ideas provided in the prototypes and operated by users 24/7 in different countries around the globe.

The final goal of the Target System is to be used by Authorities and Citizens; as any telecommunication tool, it also has to be operated. Thus, end-users representing Authorities, Citizens and Technology Experts have to assess the system, i.e. to give their opinion on the level of fulfilment of the Developed System, but also on the actual worthiness of the innovations for the Target System. The first main questions are: Does it improve your work ? your life ? Is it useful ?

- Impacts assessment:

In order to have a wider look at the system, the impacts of the system, i.e. the social, environmental and economic effects of the changes proposed by the CHORIST project, also have to be assessed by people external to the Consortium.

- The model:

The approach for the assessment in CHORIST proposes a model built on the SYSTEM, ACTORS, SITUATIONS, and ASSESSORS. The assessment is made by ASSESSORS who assess the SYSTEM and its impacts on the rest of the world by observing the SYSTEM used by ACTORS in different SITUATIONS. Figure 1 presents the SYSTEM, ACTORS, SITUATIONS, and ASSESSORS involved in the assessment process

- Strategy:

The assessment of the system and its impacts will be assessed by a set of external representatives of the Authorities, Citizens and Technologies Experts, gathered into the User Advisory Board (UAB). This will be done during presentations of the prototypes at various events (ICT 2008...) and mainly during the trials to be held in Spring 09 in Barcelona.

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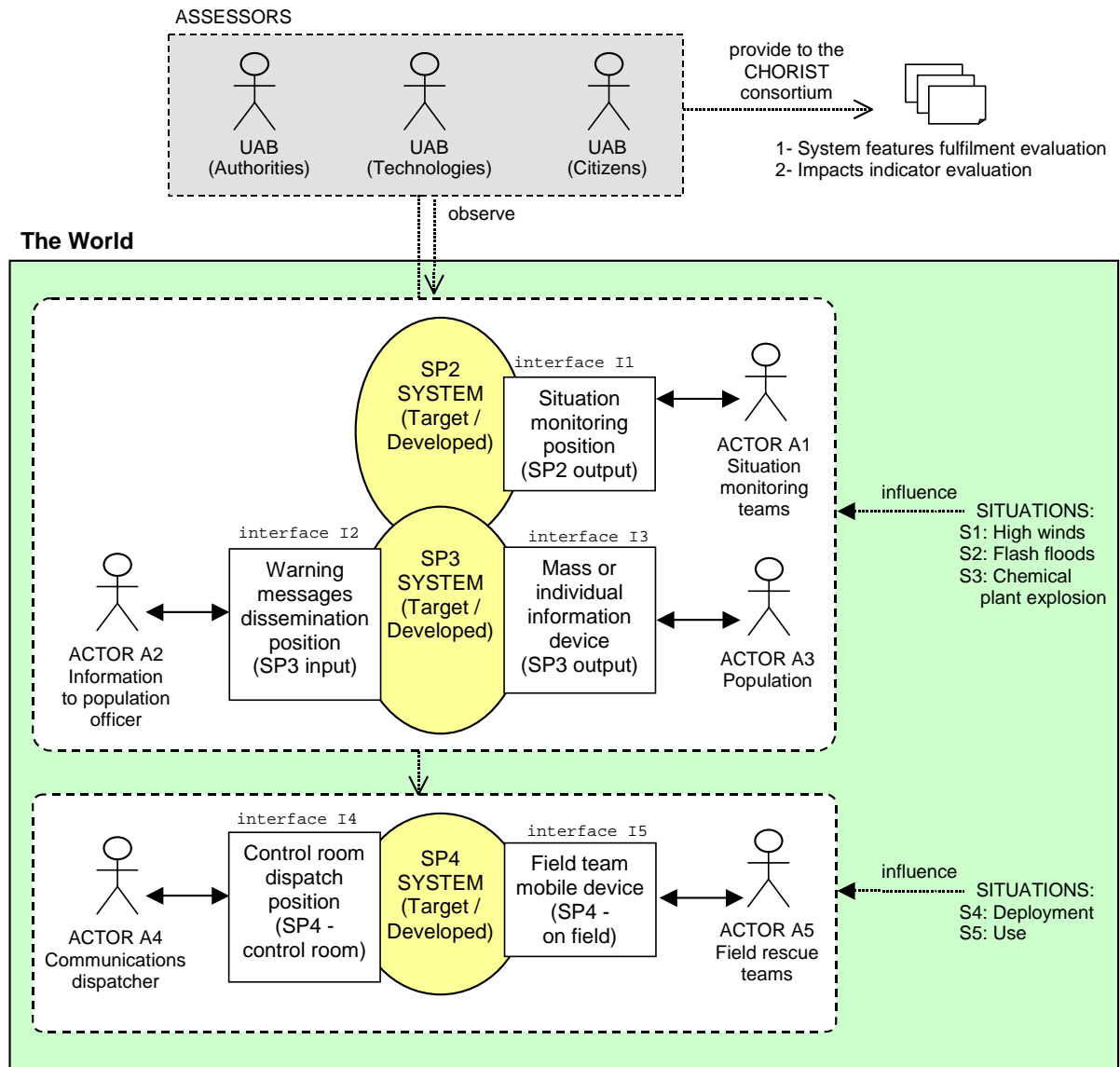


Figure 1 : Assessment process applied to CHORIST

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4 METHODOLOGY

4.1 SCOPE OF DEMONSTRATION ASSESSMENT IN THE PROJECT CONTEXT

From June 2006 till May 2009, the CHORIST Consortium has the task to produce (1) a set of 120 deliverables and reports, and (2) a prototype which will be used during presentations, trials and demonstrations. As part of the work which has to be done in this timeframe, but mainly to get an outside look on the work done by the Consortium, all these elements have to be assessed, i.e. checked if suiting the recipient's wishes.

But first, we have to clarify the scope of the assessment:

- Deliverables and reports are checked by reviewers through 3 annual reviews along the project's life. The content of the deliverables is evaluated according to European Commission guidelines, and the result of this assessment is provided in written Consensus reports. These reports are provided to the Consortium, which has in turn to either continue as before, or to correct the course it is following. The assessment of all the project deliverables and reports follows well defined EC rules, and it is out of scope of this document.
- The prototype consists of the Developed System, as defined in [1]. Hardware and software elements developed or enhanced in the frame of the CHORIST project are embedded into an environment made of laboratory tools, off-the-shelves equipments and simulators. In a general way, the Developed System is a simplified version of the so-called Target System, the system which is intended to be fully operational and deployed over countries in a more or less near future.

Two kinds of assessments are proposed in this context:

- The Developed System is assessed as is, i.e. as a prototype surrounded by simulators.
- The Target System is assessed, as as set of proposed extensions to the Developed System.

The following sections of this document will explain how to perform this prototype assessment. Results of the prototype assessment will be provided in the following deliverables:

- SP5.D9 (Report on system assessment and recommendations for further work)
- SP0.D28 (Report on impacts analysis - year 3)

The following figure shows how assessment is done at project level:

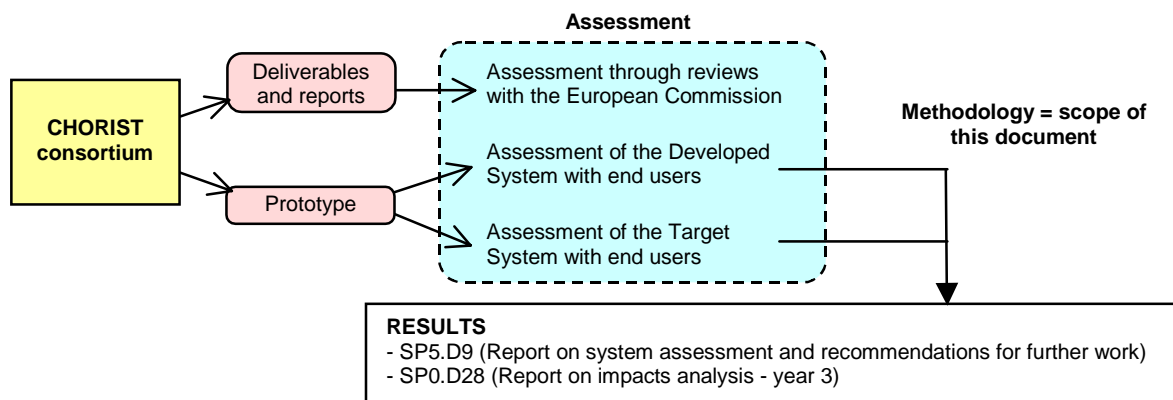


Figure 2 : Assessment of deliverables and prototypes

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4.2 PRINCIPLES OF THE ASSESSMENT

As in any system analysis process, the CHORIST system is defined by its boundaries, artificially differentiating an "inside" from an "outside"; this is just a convention which does not change the rest of the discussion. What is inside the boundaries is the SYSTEM, consisting of the Developed System or the Target System. What is outside the boundaries is the "Context", made of ACTORS and SITUATIONS; the ACTORS interact with the SYSTEM, and the SITUATIONS influence both the ACTORS and the SYSTEM itself. The inside and the outside are artificially grouped in "The World" concept.

The assessment consists of evaluating the SYSTEM (for CHORIST SP5.D9 - Report on system assessment and recommendations for further work) and its impacts on The World (for CHORIST SP0.D28 - Report on impacts analysis - year 3) by observing the SYSTEM used by ACTORS in different SITUATIONS. The people who make the assessment -the ASSESSORS- are out of this "World" picture, i.e. they are not in the SYSTEM and they are not ACTORS; they look at everything, but they do no influence anything. They do not observe only the SYSTEM, but also the ACTORS interacting with the SYSTEM. This is illustrated in Figure 4.

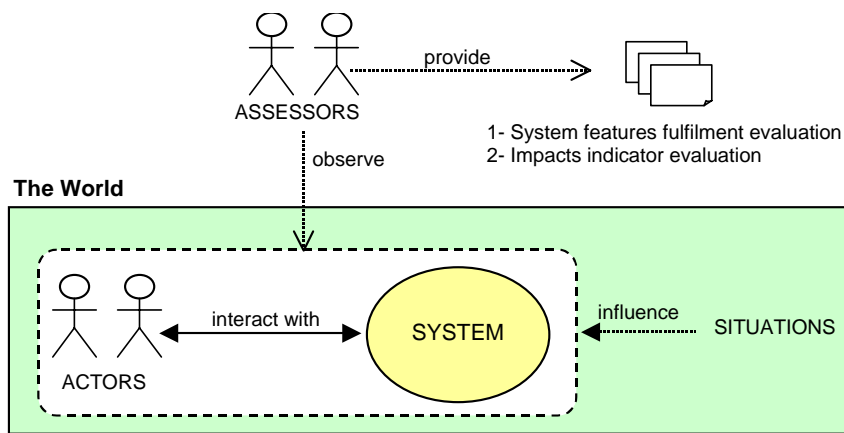


Figure 3 : Environment of the assessment process (ASSESSORS, SYSTEM, ACTORS, SITUATIONS)

- Assessment of the system:

For each ACTOR interacting with the SYSTEM, as set of features provided by the SYSTEM has been defined at the early steps of the project (see [1]). For each of these features, a set of qualitative and quantitative criteria will be defined (see Table 2), and they will be evaluated during the assessment.

ACTORS	FEATURES	CRITERIA	EVALUATION
ACTOR 1	Feature 1	Criteria 1	...
		Criteria 2	...
		Criteria 3	...
		Criteria 4	...
	Feature 2	Criteria 1	...
		Criteria 2	...
	Feature 3	Criteria 1	...
Criteria 2		...	
Criteria 3		...	
ACTOR 2	Feature 1	Criteria 1	...
		Criteria 2	...
		Criteria 3	...
	Feature 2	Criteria 1	...
		Criteria 2	...

Table 2 : System assessment evaluation through criteria

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- Assessment of the impacts:

The social, economic and environmental impacts are identified and then assessed as in Table 3. See [4].

Impacts indicators		Assessment: IS THE IMPACT TRUE ?	<i>(influence of ACTORS and SITUATIONS)</i>
#	Description	Developed System	Target system
1. Social impacts			
1	Impact 1.1		
2	Impact 1.2		
3	Impact 1.3		
4	Impact 1.4		
2. Environmental impacts			
1	Impact 2.1		
2	Impact 2.2		
3. Economic impacts			
1	Impact 3.1		
2	Impact 3.2		

Table 3 : Impacts assessment evaluation through criteria

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5 THE ASSESSMENT IN CHORIST

The following sections propose to exactly define:

- WHAT has to be assessed BY WHOM (see section 5.1)
- HOW to assess it (see section 5.2)
- WHEN to assess it (see section 5.3)

5.1 *WHAT: ASSESSORS, ACTORS, SYSTEM & SITUATIONS*

Note that ASSESSORS and ACTORS are roles, and so, they can be taken on by the same individuals.

5.1.1 ASSESSORS

The assessment will be performed by the following people, who are named ASSESSORS:

- the UAB representatives from the Public Safety/Authorities branch (see [3]), which may include some of the ACTORS using the Developed System:
 - Civil Protection of Catalonia
 - Fire Brigades of Catalonia
- the UAB representatives from the Technology and Applications branch (see [3])
- the UAB representatives from the Citizens and Utilities branch (see [3])

5.1.2 ACTORS

A set of ACTORS are identified in ANNEX I. However, this list is quite large and, in order to simplify the assessment process, and to keep it feasible, the following generic ACTORS are defined for the assessment:

- Authorities:
 - in command centres:
 - Situation monitoring teams - ACTOR A1
 - Officer in charge of informing the population - ACTOR A2
 - Dispatcher dealing with field rescue teams - ACTOR A4
 - field rescue teams - ACTOR A5
- Population - ACTOR A3

5.1.3 SYSTEM

5.1.3.1 *Developed and Target System*

The SYSTEM is either:

- the Developed System
- the Target System

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5.1.3.2 Sub-systems

The CHORIST system is divided into 3 sub-systems which work independently of the other. So, it seems more convenient to test them independently:

- SP2 prototype: Risk assessment report
- SP3 prototype: Communications to the citizens
- SP4 prototype: Emergency communications on the crisis field

5.1.3.3 Interfaces

The integration process (WP51 of the CHORIST WBS), which is terminated by the time the assessment described in this document is activated, consists of checking if the outputs of the system are similar to what is expected when setting a given set of inputs. In other words, the technical tests made during the integration check if the "transfer functions" of the system are correctly implemented: They validate the system requirements, and so, the "functions" of the system.

In the assessment process, the goal is to check if the system fits the user requirements: Thus, the CHORIST system consists of the point of view of the ACTORS on the SYSTEM. In this respect, it is convenient to present the SYSTEM as a set of interfaces:

- A situation monitoring position (INTERFACE I1 on the SP2 prototype) --> seen by the ACTOR A1
- A warning messages dissemination position (INTERFACE I2 on the SP3 prototype) --> seen by the ACTOR A2
- Public individual equipment and mass information devices (INTERFACE I3 on the SP3 prototype) --> seen by the ACTOR A3
 - DAB receiver
 - DVB receiver
 - GSM mobile phone
 - sirens
- A control room dispatch position (INTERFACE I4 on the SP4 prototype) --> seen by the ACTOR A4
- A field team mobile device (INTERFACE I5 on the SP4 prototype) --> seen by the ACTOR A5

5.1.4 SITUATIONS

The following SITUATIONS are defined: They depend on the interfaces of the SYSTEM used by ACTORS :

- For the SP2 and SP3 (Interfaces I1, I2 and I3)
 - The Developed System has been designed to handle the following subset of situations :
 - High winds (S1)
 - Flash flood (S2)
 - Chemical plant explosion (S3)
 - The Target System is able to cope with the situations identified in ANNEX II.
- For the SP4 (Interface I4 and I5)
 - Deployment (S4)
 - Operational use (S5)
 - Field to Field communications

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- Field to Ground communications
- Ground to Field communications

5.1.5 Overall picture of the assessment in CHORIST

The elements provided in section 5.1 lead to the summarising picture in Figure 4.

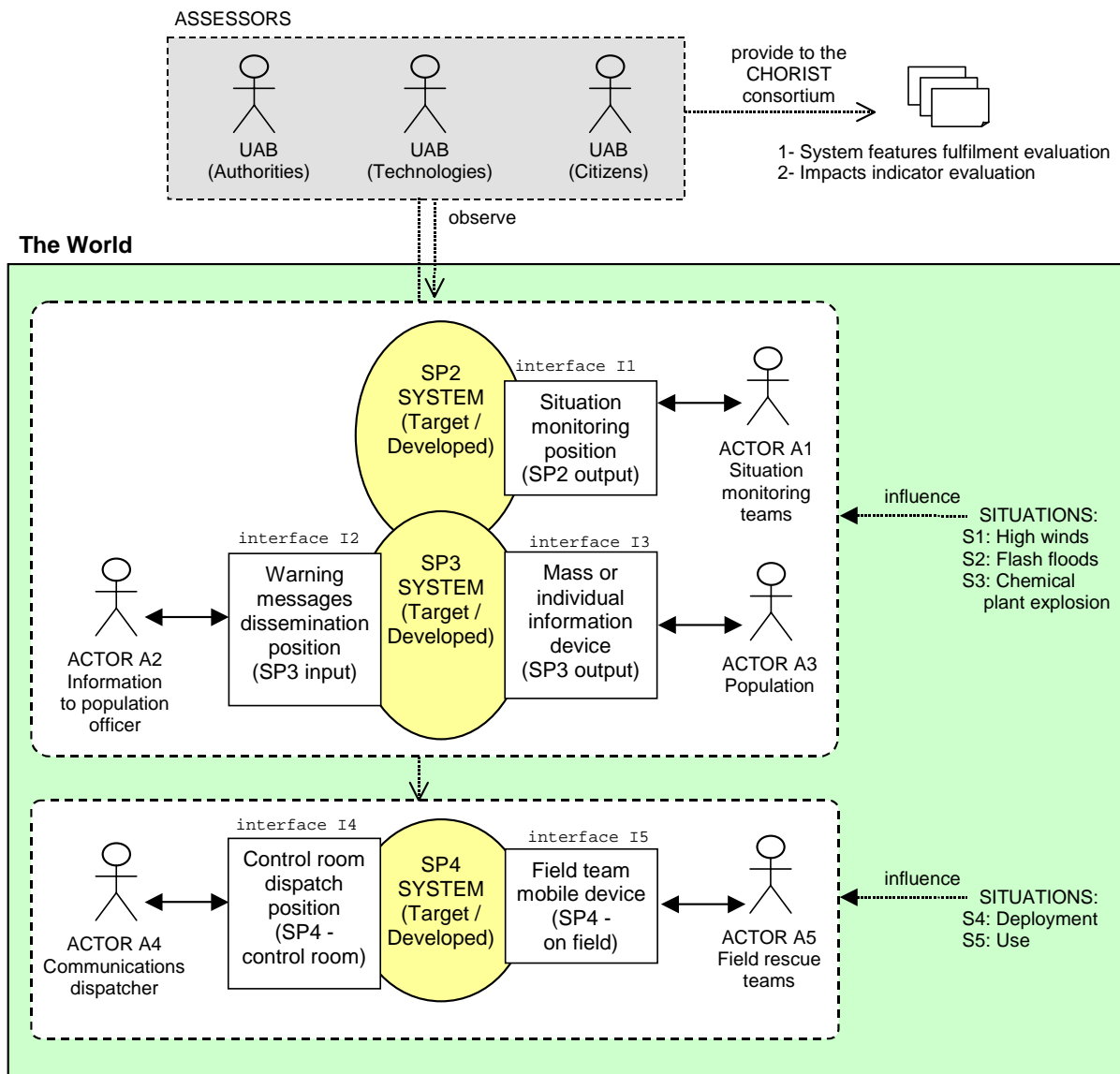


Figure 4 : Assessment process applied to CHORIST

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5.2 HOW: THE EVALUATION

The assessment will be aimed at:

1. The CHORIST Developed system, from the ACTORS point of view. Results will be provided in CHORIST SP5.D9 - Report on system assessment and recommendations for further work.
2. The CHORIST Target system itself, from the ACTORS point of view. Results will be provided in CHORIST SP5.D9 - Report on system assessment and recommendations for further work.
3. The impacts of the CHORIST Target system - i.e. the social, environmental and economic effects of the changes resulting in a Target System installed and operated. Results will be provided in CHORIST SP0.D28 - Report on impacts analysis - year 3.

Note: As already described in the methodology proposed in [4], a new system, tool, project, building, rule... installed or settled creates some "changes" in its environment. These changes have in turn social, environmental and economic effects called "impacts". For CHORIST, the "changes" consist of the "Target System in use", and they will be examined from the ACTORS point of view.

Both the Developed System and the Target System assessments will be done by observing the ACTORS point of view on the following interfaces:

- Assess Interface I1
- Assess Interface I2
- Assess Interface I3
- Assess Interface I4
- Assess Interface I5

The assessment will be done through questionnaires written by the Consortium members, and the evaluation will be held as follows:

- The questionnaire will be filled by the ASSESSORS: In case the ASSESSORS do not speak English, the questionnaires will be translated in the ASSESSORS' language(s) and the answers translated back to English.
- The ASSESSORS will be interviewed by Consortium members and the questionnaires filled accordingly. But this method is fine if the ASSESSORS and the Consortium members speak the same language.

Selection of the means shall be done before the evaluation is actually prepared. It cannot be at the moment when this document is written, as too many questions are still pending.

step	Activities		
	CHORIST Consortium	ASSESSORS	ACTORS
1	Create questionnaires based on SP5.D4		
2		Observe the ACTORS	Use the SYSTEM according to the situations.
3		Fill the questionnaires	
4	Compile questionnaires answers and fill SP5.D9 and SP0.D28		

Table 4 : Time line of the assessment activities

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5.2.1 Criteria for the evaluation of the System

The Developed System has already been tested during the integration: This phase checked if the developed functions work correctly. So, what is needed in the assessment is to test if the features suit the end users needs in terms of YES/NO answer, but also in term of qualitative and quantitative aspects.

5.2.1.1 Search for criteria

In industry, state-of-the-art of requirements and acceptance tests usually address the following elements:

- Functionalities
- Performances
- Ergonomics
- Safety / Security aspects:
 - Reliability
 - Availability
 - Maintainability
 - Safety
 - Confidentiality
 - Vulnerability
 - Security

Discussion:

About functionalities: The criteria used in CHORIST also have to consider that the "requirements" were not provided by well-defined customers (as for an industrial contract); the prototype is a proof of concept to check with users if and how far new tools could improve the way they work. Especially, the added-value of the functionalities developed in CHORIST has to be assessed, rather than the fact that the system answers to what was specified at the early stages of the project.

Functionalities will be assessed on the Target system, because the Developed System is voluntarily limited in terms of functions. This implies that when the Developed System is shown, the Target System planned functionalities are explained.

About Performances: Performances will be assessed on the Developed system, because there is no way to reliably inform the assessors on what would be the actual performances of the Target system.

About Ergonomics: The Ergonomics aspects will be addressed on the Developed system, because this is the only one which can be shown.

About Safety / Security: Reliability, availability, maintainability, safety and confidentiality are considered as criteria which have to be met by industrial companies, and which are under strict rules. This is not the goal of CHORIST to evaluate them.

The assessment will focus on the vulnerability and on the security aspects: The resistance of the system to external attacks and events will be assessed on the Target system, as no such features were implemented on the Developed system.

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Conclusion:

The list of elements provided above becomes the following list of general criteria to be assessed.

Criteria for the Developed System	Criteria for the Target System
- PERFORMANCES - ERGONOMICS	- ADDED VALUE TO EXISTING TOOLS - VULNERABILITY / SECURITY

Table 5 : Criteria

These are general rules which have to be studied for each feature of the system. The following section provided the results of this adaptation.

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5.2.1.2 Selected criteria

The features in Table 6 are inspired from the "User requirements" section of [1].

Actors/ Interfaces	Features	Criteria for the Developed System		Criteria for the Target System	
		PERFORMANCES	ERGONOMICS	ADDED VALUE TO EXISTING TOOLS	VULNERABILITY / SECURITY
A1 / I1	To detect natural disasters and industrial hazards:				X
	To show a single automated view of information from heterogeneous sources:			X	
	From messages created by 112 call centres		X		
	From legacy monitoring agencies		X		
	From sensors networks		X		
	To identify multiple alerts from the same incident	X	X	X	
	To sort alerts by date/time, source, location etc. for the same incident.	X	X	X	
	To manage several incidents at the same time	X	X	X	
	To retrieve past alert information by any combination of: - date/time range of alert - source of alert - geographical location of alert initiator - severity - incident	X	X	X	
	To assess the situation:				X
	To deliver an account of the disaster situation...		X	X	
	at the operator's request	X			
	every 2 hours.	X			
	To release of human-readable reports on incident status for decision-making		X	X	
	To forecast the situation	X	X	X	
	To provide a visual or audible indication to the operator when notifying the operator of an alert.	X	X	X	
Operational features:					
To exit with a single step and a single confirmation		X			

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	To provide an online help that can deliver a tutorial on all the capabilities of the system		X		
	To provide useful hints/suggestions to the operator at time of input.		X		
	To display errors, warnings and information messages		X		
	To provide a print feature		X		
	To be operational 24/7 every day of the year.	X			
	To be ease of use with short training	X			
	To allow multiple concurrent users	X			
	To grant access through user ID and password				X
	To provide user rights on the information delivered				X
	To be able to manage transparently at least 20 users and 15 data sources.	X			
	To provide at least local, regional, and international levels			X	
	To identify differentiate event status as active or closed		X	X	
	To import alerts manually or automatically			X	
	To allow operator to delineate area of risk			X	
	To indicate incident severity with color coding		X	X	
A2 / I2	The creation, update and dissemination of warning messages to the population following orders from the hierarchy				X
	To create messages:			X	
	- with orders written on a paper	X	X		
	- including SP2 subsystem elements	X	X		
	To be able to create both pre-planned and dynamic notification events	X	X	X	
	To be able to create messages clear and concise with structured actions	X	X	X	
	To be able to refer to web sites and regular TV channels where maps/images of the affected area and/or the emergency paths are provided.	X	X	X	
	To be able to send a "end of the emergency" message	X	X	X	
	To support delivery of alert messages in relevant languages and taking into account citizens with special needs, such as hearing and vision impaired	X	X	X	
	To be able to limit the broadcast of the warning messages in geographical areas.	X	X	X	

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	To deliver messages through: - DAB - DVB - sirens - Cell broadcast	X	X	X	
	To check whether the message has arrived and was successfully broadcast	X	X	X	
	Operational features:				
	To be operational 24/7 every day of the year.	X			
	To allow multiple concurrent on the same networks				X
	To be ease of use with short training	X	X		
	To grant access through user ID and password				X
	To support auditing			X	
	To be secured against un-authorized use of the system				X
A3 / I3	Warning messages reach citizens in - Their own dwelling - Their place of work - Public venues - While travelling on foot - While travelling using transportation facilities by supporting multiple methods of message delivery		X	X	
	Warning messages reach 50% of the citizens in the relevant area within 3 minutes and 97% within 5 minutes.	X			
	Warning messages can be delivered to those with special needs, such as hearing and vision impaired		X	X	
	Actor A3 can select to receive messages in multiple languages		X	X	
	The identity of the originator of the warning message is clear to those who receive the message		X	X	
	Warning messages can be distinguished from ordinary messages and are intrusive	X	X	X	
	The reception of the message is as transparent as possible to the citizens, requiring minimum user actions. If possible, this will be a direct message without interaction of the user		X		
	Warning messages are received, even when the networks are congested	X			
	Warning message via mobile phones are received independently from economic constraints (pre-paid SIM cards, roaming, etc.)	X	X		
A4 / I4	Wideband communication tools				X
	To use the tools:				

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	Video	X	X	X	
	File transfer	X		X	
	Web browsing	X		X	
	TSO edition	X		X	
	IT Core functions	X		X	
	Broadband communication tools				X
	To use the tools:				
	Voice	X	X	X	
	Video	X	X	X	
	File transfer	X		X	
	Web browsing	X		X	
	TSO edition	X		X	
	IT Core functions	X		X	
A5 / I5	Wideband communication tools				
	To deploy the networks:		X		
	Type:				
	Vehicles	X		X	
	Pedestrians	X		X	
	Location:				X
	Urban environment	X			
	Underground	X			
	Connection to the main communication network	X		X	X
	To set up the parameters:				X
	Users management	X			
	Groups management	X			
	To use the tools:				X
	Video	X	X	X	
	File transfer	X		X	
	Web browsing	X		X	
	TSO edition	X		X	
	IT Core functions	X		X	
	Broadband communication tools				
	Type:				
	Vehicles	X			
	Pedestrians	X			
	Location:				X
	Urban environment	X			
	Underground	X			

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	Connection to the main communication network	X		X	
	To set up the parameters:				X
	Users management	X			
	Groups management	X			
	To use the tools:				X
	Voice	X	X	X	
	Video	X	X	X	
	File transfer	X		X	
	Web browsing	X		X	
	TSO edition	X		X	
	IT Core functions	X		X	

Table 6 : Criteria for the evaluation of the Developed System and the Target System

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5.2.2 Criteria for the evaluation of the impacts

The impacts have been defined in [4]. The lists of the impacts (see Table 7) will be evaluated by the ASSESSORS and the results will be provided in CHORIST SP0.D28 - Report on impacts analysis - year 3.

Impacts indicators		Assessment: IS THE IMPACT TRUE ?	(influence of ACTORS and SITUATIONS)
#	Description	Developed System	Target system
1. Social impacts			
1.1. Way of life			
1.1.1. Authorities work			
1	Enhancement of the commandment of on-field rescue teams by authorities	X	X
2	Increased appropriate operational response taken by authorities	X	X
3	Increased efficiency of authorities when dealing with multi-hazard events	X	X
4	Increased efficiency of authorities when dealing with regional/national/international events		X
5	Increased speed of response by on-field rescue teams	X	X
6	Increased reactivity of on-field rescue teams operations to escalation	X	X
7	Increased efficiency of the operation on-field rescue teams	X	X
8	Increased safety of the operation on-field rescue teams		X
9	Enhancement of the cooperation between on-field rescue teams from different agencies, and from different countries		X
10	Cost to train public safety people to use new tools	X	X
11	Ostracism of public safety people not keen on new technologies and new habits		X
12	Increased risk of mission failure in case of a technical failure	X	X
13	More autonomy of authorities to alert populations	X	X
14	Increased efficiency of 112 call centres		X
15	Increased support of features evolutions		X
16	Increased preparation of authorities (by training)		X
17	Increased stress or pressure level for the authorities representatives (i.e. they are the step that slows the process down, as the technical information chain is more efficient, the human processing time takes a more important part in the whole risk management processing time)		X
1.1.2. People life			
18	Increased protection of the populations by authorities		X
19	Increased part of the population informed after an event		X
20	Increased efficiency of populations' response		X
21	Decreased time when people hesitate to follow authorities instructions		X
22	Increased proportion of the population understanding of alert messages and emergency language	X	X
1.2. Culture			
23	More attention and comprehension on natural events and on risky industry. (If the system result in more warnings to citizen (for example for preventive actions due to minor biological pollution or bad weather condition) the population attention to their environment may change)		X
1.3. Community			
24	Increased coherence of populations' response		X
25	Increased responsibility of populations		X
1.4. Political system			
26	Increased awareness of the necessity of EU standardized alert messages		X
27	Increased awareness of the necessity of training for the population		X
1.5. Health and well-being			

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28	Reduced lost lives		X
29	Reduced diseases and injuries to heal		X
1.6. Personal and property rights			
30	Increased protection of populations goods		X
1.7. Fears and aspirations			
31	Reduced fear of on-field rescue teams during their work in hazardous areas		X
32	Reduced fear of population to be caught by surprise by a disaster		X
33	Increased confidence of population in the civil protection services		X
34	Increased confidence of populations in industrial plants (if the CHORIST system is associated to a good preparedness)		X
35	Increased feeling of rejection of populations not keen on using new technologies (the message "you can be saved by new technologies" may be understood as "you will not be saved if you are not addicted to new technologies")		X
36	Increased anxiety of population (if they are made aware of more problems than they used to be)		X
2. Environmental impacts			
37	Limitation of the polluted areas		X
38	Limitation of the risks of pollution while transporting energy/chemical resources		X
39	If more sensors and communication means are deployed for CHORIST, this may have impact on the environment (visible devices in the nature, civil work, electromagnetic pollution...)		X
3. Economic impacts			
40	Decreased costs to heal population during the recovery phase		X
41	Decreased costs to rebuild/repair industrial equipment, infrastructure...during the recovery phase		X
42	Important first investments of governments to provide the minimum reliable CHORIST system (the minimum is already a lot : multi sensors and agencies connection, multi-regional coverage...).		X

Table 7 : Criteria for the evaluation of the impacts of the Target System

5.3 WHEN TO ASSESS IT

The assessment will take place at the following moments:

- Presentations, at least:
 - ICT 2008 in Lyon, France - 25-27 Nov. 08
 - UAB meeting in Elancourt, France – 22-23 Jan. 09
- Trials: March 09 in Barcelona and Bellaterra, Spain
- Demonstration: March 09 in Barcelona, Spain

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ANNEX I : ACTORS

Several types of ACTORS interacting with the CHORIST system are identified in the tables below.

For the Developed System

<p><u>ACTORS:</u></p> <ul style="list-style-type: none"> • authorities (responsible for managing disasters), from the Barcelona Civil Protection. <ul style="list-style-type: none"> ○ in command centres <ul style="list-style-type: none"> ▪ Situation monitoring teams ▪ Officer in charge of informing the population • authorities (responsible for managing disasters), from the Bellaterra Fire Brigades. <ul style="list-style-type: none"> ○ in command centres <ul style="list-style-type: none"> ▪ Dispatcher dealing with field rescue teams ○ field rescue teams • general public. Several factors apply: <ul style="list-style-type: none"> ○ Representatives.

**Table 8 : ACTORS using the system
(Developed System)**

For the Target System

<p><u>ACTORS:</u></p> <ul style="list-style-type: none"> • authorities (responsible for managing disasters) <ul style="list-style-type: none"> ○ in command centres <ul style="list-style-type: none"> ▪ Situation monitoring teams ▪ Officer in charge of informing the population ▪ Dispatcher dealing with field rescue teams ○ field rescue teams • general public. Several factors apply: <ul style="list-style-type: none"> ○ type: residents, workers, tourists and homeless. ○ subject to impairment (mental, physical, visual, hearing) ○ age: young, medium-age and old ○ location where the event occurs (or where the warned people are): <ul style="list-style-type: none"> ▪ from the individual point of view: <ul style="list-style-type: none"> • fixed (e.g. at home, on job spot, at school, in a shop or a mall, in a hospital) • moving (e.g. in a car, walking in the countryside, in public transportation (train, bus, subway...), on the sea) ▪ population density (large metropolitan areas, low density areas, ...)
--

**Table 9 : ACTORS using the system
(Target System)**

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ANNEX II : SITUATIONS

Several SITUATIONS influencing the operations of the CHORIST system are identified in the table below.

For the Developed System

- type of situation:
 - natural hazard:
 - related to the atmosphere:
 - storm surges, tornados
 - floods
 - technological hazard:
 - Industrial accidents:
 - chemical plants
- multi-hazard situations

Table 10 : SITUATIONS influencing the system' operations (Developed System)

For the Target System

- type of situation:
 - natural hazard:
 - related to the ground:
 - avalanche
 - earthquake
 - forest fire
 - volcanic activity
 - landslide
 - tsunami
 - related to the atmosphere:
 - drought
 - extreme temperatures
 - storm surges, tornados
 - winter storm
 - floods
 - asteroid impact
 - technological hazard:
 - transportation accidents:
 - road accident (bus and car)
 - rail accident
 - airplane accident
 - Energy/chemical resources transport, storage and handling:
 - oil
 - gas
 - chemical products
 - nuclear

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<ul style="list-style-type: none"> <ul style="list-style-type: none"> ▪ Industrial accidents: <ul style="list-style-type: none"> • biological labs • chemical plants • nuclear power plants • dam or dike failure ○ other hazards: <ul style="list-style-type: none"> ▪ urban fire • multi-hazard situations (or not) • predictability: <ul style="list-style-type: none"> ○ unpredictable, ○ short time before the actual event, ○ long time before the actual event • geographical area: <ul style="list-style-type: none"> ○ extent (e.g. city, region, countries) ○ political constraints (e.g. multi-country or not, with or without agreements between countries...) ○ topological constraints (e.g. sea, plain, mountain, city) • time: <ul style="list-style-type: none"> ○ limited to: early warning and alert (no preparedness phase, no after event recovery phase) ○ duration ○ frequency ○ evolution of the situation and its parameters along with time: <ul style="list-style-type: none"> ▪ type evolution: e.g. one hazard, followed by another one ▪ geographical area evolution

**Table 11 : SITUATIONS influencing the system' operations
(Target System)**

Note: Diseases (epidemics), political unrest (war, terrorism...) and economic events (recession) are not in the scope of CHORIST and are not considered in this impacts study.

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ANNEX III : QUESTIONNAIRES

SP2 system: Processing alerting events and providing reliable alerts to authorities.

Assessment:

1. System functioning
 - a. Did the system technically work at the test/ demo?
 - b. Did it function at the promised level related to operational needs?
 - i. Timeliness
 - ii. Transmission speed
2. Relevance
 - a. Is the concept relevant for your geographic area?
 - b. Is the concept relevant for your professional area of work?
 - c. Does it provide added value to the operational activities?
 - d. If the question above is "yes", how does it provide added value?
 - e. Is the format of the information such that it needs translation, or is it readily useable in your system?
 - f. Is the format of the information such that it is directly usable for enabling management decisions to be taken?
 - g. Does the information provided lend itself to automatic gathering and transmission, or do you need a human involvement at sensor/ transmission level?
 - h. If it is relevant, at what stage do you consider it most important?
 - i. Reducing the risk of incidents occurring
 - ii. Reducing the consequences of incidents
 - iii. Handling incidents
 - iv. Recovery following incidents
 - v. All of the above
3. Integration in existing systems at the authority levels
 - a. Are modifications needed other than software adjustments?
 - b. What are the impacts in terms of personnel?
 - i. Capacity
 - ii. Training
4. Financial implications
 - a. What are the financial implications, other than the costs of the system itself?
5. Organisational implications
 - a. Do the organisational structures needed to receive this information and handle it exist?
 - b. Do relevant organisations need to be modified to implement the system?
6. Further development/ missing functionalities
 - a. Are any functionalities missing in the system?
 - b. What should be the further developments of the system?
7. Impact
 - a. Would the system enable authorities to take more appropriate action in handling disasters than current systems allow?
 - b. Would the system serve to reduce the consequences of natural disasters in your geographical area?

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SP3: Dispatching information messages to citizens.

Assessment:

1. System functioning
 - a. Did the system technically work at the test/ demo
 - b. Did it function at the promised level related to operational needs
 - i. Timeliness
 - ii. Appropriate coverage
2. Relevance
 - a. Is the concept relevant for your geographic area?
 - b. Is the concept relevant for your professional area of work?
 - c. Does it provide added value to the operational activities
 - d. If the answer to the question above is "yes", how does it provide added value?
 - e. Is the format of the information such that it will be easily created in your system?
 - f. If it is relevant, at what stage do you consider it most important
 - i. Reducing the risk of incidents occurring
 - ii. Reducing the consequences of incidents
 - iii. Handling incidents
 - iv. Recovery following incidents
 - v. All of the above
3. Integration in existing systems at the authority levels
 - a. Are modifications needed other than software adjustments?
 - b. What are the impacts in terms of personnel
 - i. Capacity
 - ii. Training
4. Financial implications
 - a. What are the financial implications, other than the costs of the system itself?
5. Organisational implications on the part of the authorities.
 - a. Do the organisational structures to create and distribute the messages already exist?
 - b. Do relevant organisations need to be modified to implement the system?
6. Organisational implications on the part of the population.
 - a. Are the structures to inform the population about the system and what is expected from them when it is activated in place?
 - b. Would the messages conveyed by the system as presented be easily identified and accepted as authentic by the population?
7. Further development/ missing functionalities
 - a. Are any functionalities missing in the system?
 - b. What should be the further developments of the system?
8. Impact
 - a. Would the system enable authorities to take more appropriate action in handling disasters than current systems allow?
 - b. Would the system serve to reduce the consequences of natural disasters in your geographical area?
9. To assess the DAB message
 - a. Do you identify the special announcement of a warning message in the current radio programme ?
 - b. Do you understand the event which has occurred ?
 - c. Do you understand what you should do after receiving the warning message?

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10. To assess the DVB message

- a. Will you hear/recognize the special sound of the warning message?
- b. Do you think that the message is clear enough and comprehensible?
- c. Would it be useful to see images of the disaster area on the message window?
- d. Do you identify the sender of the message? Worth taking care of ?
- e. Would you like to be able to interact with the message (move, cancel, enlarge, record, etc.)
- f. Do you understand what you should do after receiving the warning message?

11. To assess the mobile phone message

- a. Would you prefer to have a special tone announcing the warning message?
- b. Would you prefer that the content of the message appear directly on the screen?
- c. Do you think that the message is clear enough and comprehensible?
- d. Do you identify the sender of the message? Worth taking care of?
- e. Do you evaluate positively the fact that the warning message can be received even if the networks are congested?
- f. Do you understand what you should do after receiving the warning message?
- g. Would you consider a violation of your privacy to receive an alert message on your mobile phone?

12. To assess the sirens

- a. Do you understand the event which has occurred?
- b. Do you understand what you should do after receiving the warning message?

13. In the event of an emergency abroad

- a. Would you like to receive warning messages when you are travelling abroad?
- b. Would you like to be informed on the possibility of receiving warning messages when entering a foreign country?
- c. How do you evaluate the fact that -in some countries- the warning message could be delivered in your language?
- d. How do you evaluate the fact that -in some countries- the warning message could be delivered in the local language or in English, and not yours?
- e. DVB and mobile phone: Would you prefer to pre-set the language of the message, or to have the message written in different languages?

14. About the system

- a. Do you think that receiving a warning message through different medias at the same time would reassure you in the reliability of the alert?
- b. Once the alert is received, would you expect more information?

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SP4: Providing rapidly deployable communication means for in-the-field response teams.

Assessment:

1. System functioning
 - a. Did the system technically work at the test/ demo
 - b. Did it function at the promised level related to operational needs
 - i. Timeliness
 - ii. Transmission speed
 - iii. Appropriate coverage
2. Relevance
 - a. Is the concept relevant for your geographic area?
 - b. Is the concept relevant for your professional area of work?
 - c. Does it provide added value to the operational activities?
 - d. If the question above is "yes", how does it provide added value?
 - e. If it is relevant, at what stage do you consider it most important?
 - i. Reducing the risk of incidents occurring
 - ii. Reducing the consequences of incidents
 - iii. Handling incidents
 - iv. Recovery following incidents
 - v. All of the above
3. Integration in existing systems at the authority levels?
 - a. Are modifications needed other than software adjustments?
 - b. What are the impacts in terms of personnel?
 - i. Capacity
 - ii. Training
4. Financial implications
 - a. What are the financial implications, other than the costs of the system itself?
 - b. If the answer to the above
5. Organisational implications?
 - a. Are the organisational structures needed to implement the system in place?
 - b. If the answer to the question above is "no", which structures need to be established?
 - c. Do relevant organisations need to be modified to implement the system?
6. Further development/ missing functionalities
 - a. Are any functionalities missing in the system?
 - b. What should be the further developments of the system?
7. Impact
 - a. Would the system enable authorities to take more appropriate action in handling disasters than current systems allow?
 - b. Would the system serve to reduce the consequences of natural disasters in your geographical area?