Driving Innovation in Crisis Management for ***E***uropean ***R***esilience

D13.2 – Milestone Report 1: Subproject Experiment 2 Design

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List of Acronyms

Abbreviation / acronym	Description
ACRIMAS	Aftermath crisis management system-of-systems demonstration (road-mapping study preceding DRIVER)
CM	Crisis management
COTS	Commercial off the shelf
CoU	Community of users (DG HOME)
CT	Coordination team (DRIVER)
DM	Disaster management
DoW	Description of Work
DP	Demonstration programme (European security research)
EC	European commission
ECHO	Humanitarian aid and civil protection department (directorate general; EC)
EDEN	End-user driven demo for CBRNE (chemical, biological, radiological, nuclear, explosive); other DP
ERCC	Emergency response coordination centre
ESRAB	European security research advisory board
Expe	Experiment
FD	Final Demonstration (DRIVER)
HOME	Migration and home affairs department (Directorate General; EC)
ICT	Information and communication technologies
IFRC	International Federation of Red Cross and Red Crescent Societies
IPR	Intellectual Property Rights
ISCRAM	Information systems for crisis response and management
ISO	International organization for standardization
IT	Information technologies
JE	Joint experiment
M&S	Modelling and simulation
MS	Member state(s)
MS*x*	*x*th Milestone of DRIVER
PCP	Pre-commercial procurement

Abbreviation / acronym	Description
PMC	Project management committee (DRIVER)
POES	Portfolio of emerging solutions (DRIVER)
PPI	Public procurement of innovative solutions
RC	Red cross (movement)
R&D	Research and development
SE2	Subproject experiment 2 (DRIVER)
SOTA	State of the art
SP	Subproject (main subdivision of DRIVER)
TIEMS	The international emergency management society
TRL	Technology readiness level
UNISDR	United Nations International Strategy for Disaster Reduction
WP	Work package (subdivision of SP in DRIVER)

Project Description

DRIVER evaluates emerging solutions in three key areas: civil society resilience, responder coordination as well as training and learning.

These solutions are evaluated using the DRIVER Test-bed. Besides cost-effectiveness, DRIVER also considers societal impact and related regulatory frameworks and procedures. Evaluation results will be summarised in a roadmap for innovation in crisis management and societal resilience.

Finally, looking forward beyond the lifetime of the project, the benefits of DRIVER will materialize in enhanced crisis management practices, efficiency and through the DRIVER-promoted connection of existing networks.

DRIVER Step #1: Evaluation Framework

- Developing Test-bed infrastructure and methodology to test and evaluate novel solutions, during the project and beyond. It provides guidelines on how to plan and perform experiments, as well as a framework for evaluation.
- Analysing regulatory frameworks and procedures relevant for the implementation of DRIVER-tested solutions including standardisation.
- Developing methodology for fostering societal values and avoiding negative side-effects to society as a whole from crisis management and societal resilience solutions.

DRIVER Step #2: Compiling and evaluating solutions

- Strengthening crisis communication and facilitating community engagement and self-organisation.
- Evaluating emerging solutions for professional responders with a focus on improving the coordination of the response effort.
- Benefiting professionals across borders by sharing learning solutions, Lessons learnt and competencies.

DRIVER Step #3: Large scale experiments and demonstration

- Execution of large-scale experiments to integrate and evaluate crisis management solutions.
- Demonstrating improvements in enhanced crisis management practices and resilience through the DRIVER experiments.

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Executive Summary

This document is DRIVER's first milestone report. The first DRIVER milestone (MS1) was the design of the Subproject Experiments 2 (SE2). At the milestone it had to be evaluated whether the solutions, the research questions, and Test-bed assets were sufficiently mature to start SE2.The consortium found this to be the case, based on the results of DRIVER's subprojects up to the milestone. Therefore this report presents these results extensively. This is particularly true for SP3, 4, and 5 as the owners of solutions to be tested as well as of the SE2 constituent experiments, and of SP2 being in charge of developing the DRIVER Test-bed.

At the time of MS1, a draft plan for SE2 was also submitted. At the time of submitting the present revised version of this report, it can stated that the plan so far has been implemented with some but relatively modest delays. It is noteworthy that two pairs of experiments from different SPs were twinned in implementation in a way not foreseen in the original plans (Annex 2).

In the work toward MS1 serious problems in DRIVER became evident. Lack of shared understanding within the consortium indicated the need for an update of the DRIVER Concept. The presented update is in line with the (original) DoW but explicates the important background of security systems-of-systems thinking as first developed in ESRAB, one of the expert forums that framed the European security research programme. The term Portfolio of tools had been found to create some confusion and was therefore replaced – while retaining the core content of it from the DoW– by Portfolio of emerging solutions, or Set of solutions. In addition to this solutions dimension DRIVER has two more dimensions. One is methodology and infrastructure – in charge of developing a distributed European Test-bed able to support crisis management capability development also after the end of the DRIVER project. Third comes the community dimension, and linked to this engagement and communication was identified as another area in need of corrective action.

For the benefit of both shared understanding internally and more effective engagement and communication externally, shared DRIVER terminology was identified as a third area in need of corrective action. A common DRIVER terminology has been developed and is presented in Annex 3 of this report. To ensure the enforcement of the terminology and in order to keep it up to date, it will be updated and released to the consortium on an annual basis as part of the DRIVER Project Handbook (D11.1), being a living document.

1 Introduction

1.1 Scope and aim

This document is DRIVER's first milestone report. The content of the first DRIVER milestone is the design of the Subproject Experiments 2 (SE2). This consists of individual experiments or series of linked experiments – experimentation campaigns[1] – performed by the three solution oriented subprojects: SP3 – civil society resilience, SP4 – responder coordination, and SP5 – training and learning. The emerging DRIVER Test-bed – SP2 – is to provide methodology and infrastructure support. The objective of SE2 is to mature solutions and Test-bed assets for the ensuing Joint Experimentation campaigns (JE1 and JE2).

The present version of this deliverable is the second resubmission, almost two years after the original version. This means that at the time of drafting the resubmission most of SE2 has been carried out and the rest was planned in detail when the project was suspended after the ad hoc review in spring 2016. But rather than producing, with the benefit of hindsight, a 'perfect' plan, this document takes as its point of departure the state of knowledge at – or in some cases, for reasons to be explained, a few months after – the time of the first milestone. In the main text 'anachronistic' content referring to the state of knowledge when composing this revised version will appear as footnotes. The timing for the Annexes is commented in Section 1.3.

In connection with the MS1 work several problems became evident in the project. These and the corrective actions in response are summarised in Section 1.2. Two of these actions are reflected by full-length texts in this report: an update of the DRIVER Concept (Section 2) and a common DRIVER terminology (Annex 3, see also next section on that).

The main part of this report (Section 3) is an overview of the subproject results during the first 10 months of the project.

These results form the basis for the milestone decision to be taken by Project Management Committee (PMC) at MS1: whether or not to accept the design for SE2 in terms of definition of tool candidates, Test-bed assets, and scenarios to be used for SE2. The decision including the preliminary plan for SE2 is summarised in Section 4.

The formal input to the present deliverable is D13.1, according to the DoW. The written materials to MS1 have been provided by the SP leaders, as an output of the respective coordination work packages (i.e., WP21, WP31, WP41, and WP51).

[1] This terminology is elaborated in Section 3.2.3 and Annex 3.

1.2 Corrective actions in connection with MS1

Several needs for corrective action were identified during the period when MS1 was in preparation. These needs were identified at external and internal engagements, including the first Advisory Board meeting (January 2015).

Work on clarification and update of the **DRIVER Concept** was then already ongoing in the PMC with the Ispra meeting (early February 2015) and the MS1 report as targets. This work is reported b Section 2 of the present deliverable.

A related issue was the **common terminology**. Due to the heterogeneity of the DRIVER consortium consisting of researchers, industry and end-users several terms were differently interpreted and defined. Therefore, a common DRIVER terminology has been developed which is presented in Annex 3 of this report.

To ensure the enforcement of the terminology and as definitions of terms might change over time as new knowledge and understandings accumulate, it will be checked for any updates required and released to the consortium on an annual basis as part of the DRIVER Project Handbook (D11.1), being a living document. It is foreseen to coordinate with other projects on terminology. A final version of the terminology will be presented at the end of the DRIVER project.

The review of the project's **Engagement and communication strategy** resulted in the identification of several needs and opportunities to make the strategy evolve with regard to effectively engaging with the external world on the basis of the updated DRIVER Concept (see Section 2). Required changes in engagement and communication with the external world naturally resulted from the project so far being rather inwardly focused in order to achieve internal organisation and shared understanding of the project concept. Also the target audiences and key messages needed to be defined. The understanding of the objectives and goals for post-DRIVER sustainability were identified as particularly salient in both these regards.[2]

1.3 Document structure

In addition to this introduction the present deliverable consists of the following main components:

- Section 2 - **The DRIVER Concept:** A**n update**. This intends to explain DRIVER's S&T objectives and how they are linked to the SP structure.
- Section 3 - **Subproject results**. The main result of DRIVER's first ten months[3], providing the material base for the MS1 decision to start SE2 or otherwise.

[2] In the original D13.2 the full DRIVER engagement and communication strategy was included as a section. This has now been removed as being obsolete in view of the substantial actions taken in this regard as part of the restructuring following the review of DRIVER after the first year.

[3] As will be commented one SP has been tracked somewhat longer to capture the point in time when the SE2 list of experiments became stable.

- Section 4 – **Subproject experimentation 2 – SE2**. This section briefly summarises the MS1 decision and the preliminary SE2 plan at that time. Subsequent developments are summarised in a footnote (also cf. Annex 1).
- Annex 1 - **Overview of SE2 planning at MS1**. This is a graphical overview retained from the original D13.2.
- Annex 2 – **Detailed situation of SE2** scheduling/implementation **at the time of suspension**. This is a set of detailed tables from the original D13.2 updated with information on execution and planning of trial events.
- Annex 3 - **DRIVER terminology** including information on its creation and a procedure for updating as part of the Project Handbook (D11.1).
- Annex 4: **Experimental methodology: a six-step approach**. The concrete methodological guideline for SE2 (cf. Section 3.2.3).

2 The DRIVER Concept: An update

This update is in line with the DoW but intends to better explain to DRIVER participants and stakeholders the important background of security systems-of-systems thinking as first developed in ESRAB, one of the expert forums that framed the European security research programme. The term Portfolio of tools has been found to create some confusion and is therefore replaced – while retaining the essential DoW meaning – by Portfolio of emerging solutions or Set of solutions.

2.1 DRIVER's vision

DRIVER has three dimensions: Crisis Management ***Solutions****,* ***Test-bed****, and* ***Community****. These shall all help* ***catalysing a strengthened European innovation ecosystem for crisis management*** *and they do this by each contributing towards one key function of this ecosystem: community –* ***articulating needs as requirements****; solutions –* ***developing solution ideas****; and methodology and infrastructure –* ***testing and evaluating proposed solutions against requirements****.*

Below first a background of DRIVER's position in the FP7 Security context is given in Section 2.2. Then each of the three dimensions is given a discussion in Section 2.3-5. Section 2.3 on the solutions dimension contains subsections devoted to the selection of focus areas as embodied in the specific themes of SP3-5 respectively, and to the mentioned terminological shift from Portfolio of tools to Portfolio of emerging solutions.

In due course the project will define how the key components can be institutionalised and made economically and societally sustainable. This in-depth discussion has started already as it may impact the understanding of objectives and priorities of the project as it progresses.

2.2 Background

DRIVER is the phase 2 project of FP7 Security's demonstration programme (DP) in Crisis Management (CM). This and the four other DPs in different security areas are a main programme instrument innovation first proposed by advisory body ESRAB in 2006 [1]:

The third research path, system-of-systems demonstration, recognises that for large security solutions to enter into service, numerous independent but interrelated systems must be integrated and then demonstrated to prove operational effectiveness. In areas of significant European interest, it is recommended that demonstration programmes be established to act as federative frames to coalesce the required research. These European flagships would aim to

ensure the coherent development of the required system building blocks, architectures and standards.[4]

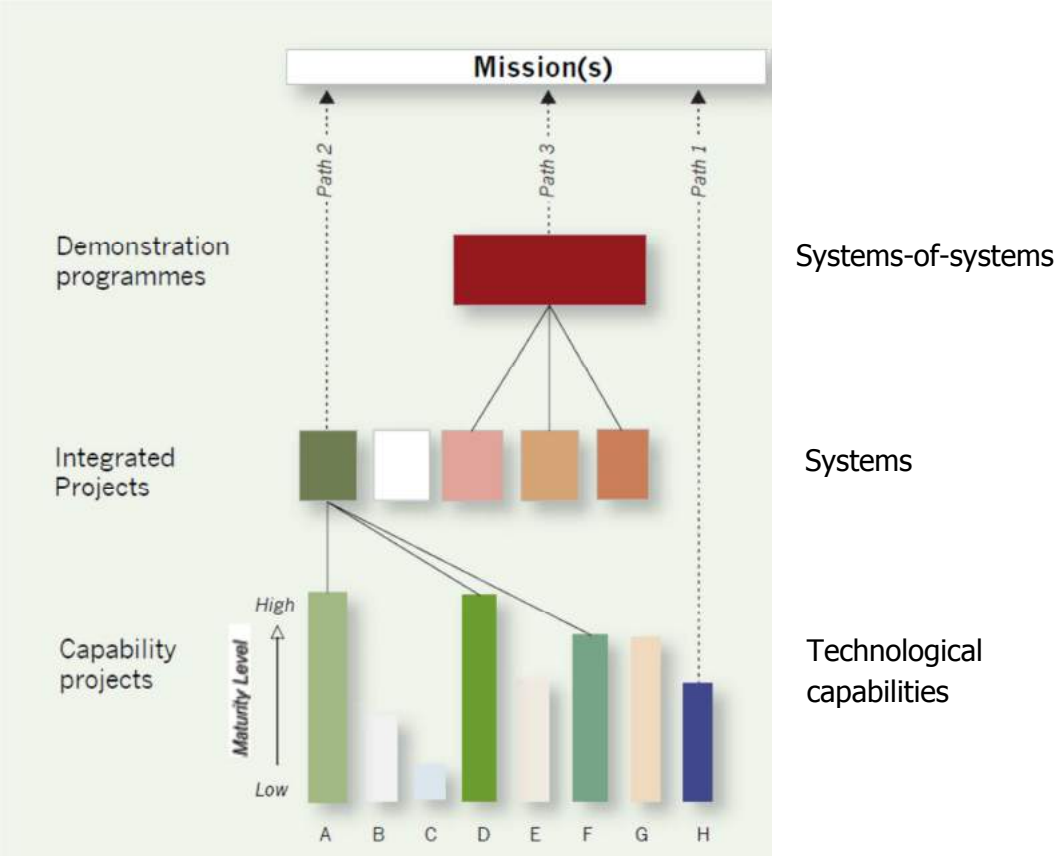

Figure 1: Three paths for security research according to ESRAB, (system levels added [1], p.20)

This idea is well conveyed by the illustration. Whereas lower level systems may be highly integrated, the solutions deployed to address major security tasks will typically have to be more loose federations of such integrated systems – in other words systems-of-systems. This is particularly true for CM where major emergencies have to be tackled everywhere across Europe – and beyond, and with all sectors of society potentially involved. Hence each individual crisis can be said to require its unique system-of-systems solution: if it can be brought to bear fast and functions smoothly, human suffering and material losses can be minimised. Facilitating this is DRIVER's main challenge.

Further, the project is not restricted to response but considers all emergency phases. Therefore questions like trade-offs and synergies between resilience building and response are also within the scope. In doing this we take subsystem and system level solutions (building blocks in ESRAB's terminology) that are existing – legacy – and emerging – e.g., from research projects – and combine them to learn more about system-of-systems level effects. This will then guide decision-making on procurement, development and research, as well as architecture and standards.

[4] [1], p. 7.

2.3 DRIVER's Solutions dimension

The main result in DRIVER's Solutions dimension will be a 'Portfolio of emerging solutions', selected based on the added value of the novel functions supported, and accompanied by information on maturity level, requirements and suitable instruments for reaching fieldable products, as well as recommendations regarding context factors (e.g., legislation or institutional structures).

While DRIVER on the whole is a faithful implementation of the original ESRAB DP concept, there are also several ways in which DRIVER claims to improve on the concept. First and perhaps trivially, Figure 1 may convey the picture of European security research as a closed system, but of course DRIVER builds on much other input than from its sister projects in the European framework programmes.

When it comes to "required system building blocks, architectures and standards" DRIVER operates with the concept 'Solutions dimension'. Here it is important to understand ownership and maturity, the latter referring to how far, e.g., a product idea is from being fielded. When it comes to standardisation, ownership of issues rests with the standardisation bodies; what DRIVER can do here is but the development of good proposals. An updated architecture for CM is a foreseen product of DRIVER and closely related to the work on novel system building blocks; in what follows we will refer to the novel *functions* that these building blocks deliver and also refer to the architecture as functional. The term 'building block' may sound technical, but in DRIVER also such things as doctrines, training courses, and information programmes should be included under the heading.

While an already fielded building block may support a novel (or at least hitherto not sufficiently noticed) function, the typical case is that novel functions are only supported by prototype building blocks, e.g., coming from previous European projects as indicated in Figure 1. In fact DRIVER has access to a wide range of such building blocks via its partners. Still we foresee a need for involving even more functions in our work, with an upcoming Open call one key mechanism for such involvement.[5] It may also happen that DRIVER itself develops novel building blocks. But the normal case is for DRIVER to focus on the systems-of-systems level, relying on systems already developed by others.

The most valuable additional functions not requiring extensive research as identified by the totality of DRIVER activities will be collected in the **Portfolio of emerging solutions**, where a 'solution' is something (e.g., a tool, a method or a system) that implements a function. This portfolio will be limited by the fact that DRIVER only addresses parts of the CM domain. As already discussed, this selection is made on rational grounds and it can be assumed that, e.g., coming developments in the provision of energy to responder activities will not fundamentally overturn DRIVER's results. Further, when interfaces between systems are well-understood, as in the mentioned example, DRIVER results and knowledge from areas not treated in DRIVER experiments will typically be easily combined using

[5] As it turns out the Open Call mechanism will not be employed as part of future DRIVER activities. The project, however, intends to involve end-users/practitioners and solution providers external to the consortium through an alternative mechanism for future activities (dedicated Work Package 103 proposed as part of amended DoW), allowing the selection of several participants and solutions to be involved based on transparent criteria in order to ensure that the technological state of the art and relevant available knowledge will be taken into account.

expert judgement, thereby extending conclusions also to these areas not covered in-depth in the project.

Among innovation experts it is well-understood that successful innovation requires that many ideas be tested – and in most cases found less suitable – for a few ideas really to be carried through to real innovation, i.e., in our case implementation in real CM systems. We therefore expect DRIVER to contribute insights that some proposed functions do not seem such valuable additions to CM capabilities as claimed.

While DRIVER will focus on solutions not requiring extensive additional research, typically they will not be available for immediate deployment but require additional development and piloting activities. To help ensure coherent development, DRIVER will assess maturity not only in the traditional technology readiness level (TRL) terms but also according to the time and resources needed, as well as the suitable policy instruments, for reaching a fieldable product; examples of instruments can be Pre-Commercial Procurement (PCP) and Public Procurement of Innovation (PPI).

2.3.1 DRIVER's focus areas

Based on the gap analysis in the phase I project ACRIMAS, DRIVER thematically focuses on civil society resilience, strengthened responders, and evolved learning. Further DRIVER focuses on complex and intense interaction between these areas; this decision comes from the analysis that DRIVER as a big project has a unique possibility to address such problems.

Even a project of DRIVER's size cannot afford giving equal attention to all aspects of CM. Here the fact that DRIVER is phase 2 comes in handy: It was preceded by no less than three parallel phase 1 road-mapping studies. Of these ACRIMAS provided a gap analysis, which has been highly informative for the design of DRIVER in terms of what substantive CM problem areas to include. The upshot of this gap analysis is that DRIVER is focused on civil society resilience (SP3), strengthened responders (SP4), and evolved learning (SP5).

This decision was not made based on importance alone. Another consideration is that DRIVER should focus on systems where interactions at least in some scenarios are intense and complex. By way of example, the interaction between modern resilient volunteers and professional response is a highly complex and dynamic area and hence a natural focus of DRIVER. In contrast provision of energy to responder activities or search and rescue activities are important and dynamic development areas, but their interfaces with other systems are relatively simple and already well understood, therefore they do not have to be actively tested in the DRIVER project. As said above, as a project including, e.g., both civil society resilience and strengthening responders, DRIVER has a unique opportunity to explore the linkages between these areas.

2.3.2 From Portfolio of tools to Portfolio of emerging solutions

The terminology 'portfolio of emerging solutions' used above replaces 'portfolio of tools' used in the DoW. This is not a deviation in technical terms: 'Tools' was given a very inclusive definition in the

DoW. However, it turned out that while unproblematic to other constituencies, for people with an ICT background the concept 'tool' had too special connotations, largely pointing to commercial-off-the-shelf (COTS) products.

Furthermore we found it informative to add the adjective 'emerging': the DRIVER portfolio will encompass solutions not requiring extensive additional research, i.e., beyond TRL 6-7. While this can in some cases mean an already finished product – which for some reason has not yet been broadly implemented – more normally the solutions identified will still require substantial additional development work.

Depending on the context, we can use also the term "set of solutions" instead of "portfolio of emerging solutions" with a similar meaning, as indicated in the DRIVER Terminology included in Annex 3.

2.4 DRIVER's Methodology and infrastructure dimension

DRIVER develops the ESRAB DP concept by

- *performing experimentation campaigns that allow the risk-taking necessary to create genuinely new knowledge at system-of-system level*
- *striving to post-project sustainability of the Methodology and infrastructure dimension in the form of a distributed Test-bed for CM capability development.*

As for methodological content, the ESRAB statement that for DPs "the integration and demonstration aspect" should represent "the majority of the work"[6] has not been followed to the letter in DRIVER. Instead, our position is that the same approach should apply at system-of-systems level as in component and system development. That is, the final configuration should not be chosen directly and then demonstrated. Rather long campaigns of explorative experimentation should be performed prior to the final definition, ascertaining solid knowledge foundations of the Portfolio of emerging solutions for the Final Demonstration. An experiment will typically include physical experiments, computer simulations and/or elicitation of people's knowledge, needs and concerns – e.g., in the form of expert group meetings and table top gaming.

Whereas the amendments in the Solutions dimension can be seen as natural elaborations on the DP concept, DRIVER's claim to originality is greater in the methodology and infrastructure dimension. In addition to performing extensive system-of-systems level experimentation before going to demonstration, we also argue that the investment into infrastructure and methodology to achieve the requested results in the Solutions dimension should not be thrown away at the end of the project; certainly the need for CM innovation will not go away. Therefore DRIVER strives to contribute towards a distributed European Test-bed for CM capability development, sustainable also after the project.

[6] ESRAB op. cit. p. 20.

2.5 DRIVER's Community dimension

The main goal of DRIVER's Community dimension is to engage and connect to stakeholder networks, and to foster a more shared understanding of CM.

The third dimension of DRIVER is community building. Being a CM demonstration project in European security research this is an obvious obligation of DRIVER. In this dimension DRIVER aims to enable the European crisis management community – including its stakeholders from regional to EU level – to carry out a structured debate that supports requirements driven capability development. Although individual steps to be executed to build such an enabled community have not been outlined in detail in the DoW, the project's position on the necessity of this dimension has not changed. DRIVER's goal is (i) to develop sustainable structures to inform, enable and engage regional first responder networks, (ii) to better connect existing networks at different levels, and (iii) to foster a better understanding of requirements formulation and research and procurement activities needed to transfer these requirements into actual crisis management capabilities across all stakeholders.

3 Subproject results

3.1 Introduction

This section summarises progress until MS1 in the subprojects (SPs) of DRIVER. It focuses on progress towards – naturally in this MS1 report – SE2 and the S&T objectives. As formulated in relation to the dimensions of the DRIVER concept (Section 2): the portfolio of emerging CM solutions (Solutions dimension), the distributed Test-bed (Methodology and infrastructure dimension), and the contribution to community building in European CM (Community dimension).

Hence SP1 Management is not reported and also not routine activities in other SPs.[7]

SP2 is of most relevance for the Test-bed dimension. SP3-4-5 are in charge of the Solutions dimension, and of particular interest for the present deliverable since they are the owners of SE2, the specific subject of this milestone. SP7-9 have main roles for the Community dimension.

A first comment concerns Subproject experimentation 1 (SE1). SE1 has primarily functioned as concept development for SE2, defining solutions and problem situations (research questions, scenarios) based on the state of the art (SOTA) exercises performed in the different SPs.

In SP2, SP3 and SP5 SE2-related work contributing to this MS1 is structured according to work packages (WPs). Therefore the sections on these SPs are organised in WP terms. In SP4 larger experiments have been designed, which are cross-cutting with regard to WPs, there the structure follows these experiments.

3.2 SP2 Test-bed

The conducted state of the art analysis has identified a number of examples, both conceptual and organisational, that will provide effective guidance to developing the Test-bed. The analysis leads to a more precise formulation of the objective for the DRIVER Test-bed. It has also provided material that will be used to design suitable organisation models for a long term, sustainable Test-bed.

In order to improve the coordination between experimental and Test-bed activities, SP2 prioritised early and close contacts with SP3-4-5, e.g., by participating in some of their larger working meetings. As a result and contribution to the SE2 design and planning, there is now a deeper understanding throughout the project of the experimentation needs, available supporting resources and the processes needed to make them match. These contacts were also an effective way for SP2 to get early knowledge of the evolving experimentation plans within SP3-4-5.

[7] SP6 started M11 and is reported in Milestone Report 2.

3.2.1 Platforms (WP25, 26)

An important outcome is the inventory of DRIVER platform resources that may be used for hosting experiments. In addition to the earlier organisations that were known from the start, it is now clear that seven crisis management organisations will be connected to the Polish DRIVER platform, ranging from national to city level.

As reported in Section 4.2 a higher than expected number of SE2 experiments are scheduled to take place in DRIVER platforms.

3.2.2 ICT infrastructure and tools (WP22, 24, 27)

Work in the tools-oriented work packages is well under way, with the first set of deliverables describing modelling and simulation (M&S) and other software support tools in review at MS1. One of the important parts in the whole DRIVER Test-bed infrastructure is the IT architecture, which is developed in close collaboration with the SP4 technical architecture.

Modelling & simulation (M&S) has a critical role in DRIVER. The initial plans for concrete use of M&S in connection with experiments had an unstated focus on simulating the crisis event as such, generating descriptions of how it unfolds in time and space, and feeding this to participants in the experiment. As the deeper analysis of the DRIVER approach shows, M&S has an even larger, more critical role to play in other stages of experimentation, e.g., planning the experimentation campaigns or extending an experiment to explore a large number of variants. Another role could be to bridge together two experiments, filling in missing data. The most important contribution of M&S to the DRIVER approach may be to the assessment phase: since it will never be possible to experiment on a comprehensive system-of-systems, models are needed to describe how contributions from various systems come together.

SP2 will analyse how we can best explore this extended role of M&S. Practical M&S work should still be directly connected to the DRIVER experiments, but this new insight may require more internal work in SP2, e.g., to adapt models to better suit assessment. Another issue that will be very important in the long run for CM capability development is validation of models. As part of this, we will also increase our search for existing simulation tools and models, looking for resources not owned by project partners that may be available.

3.2.3 Experimentation campaign methodology (WP23, 24)

Similarly experimentation campaign methodology deliverables were submitted at MS1. In addition to the outcome of all planned activities, two insights that will affect the coming work have been reached. There is need for a clear terminology on experiments and experimentation campaigns, which is provided by Annex 2. A summary of their key characteristics are:

- In the project, **experimentation** involves the testing of novel solutions under controlled conditions. The term experiment is used for all types of experimentation activities in DRIVER.

- An **experimentation campaign** contains a series of linked experiments. The progression of moving to higher level of complexity is an important part of a campaign. What is more, the design of an experiment in a campaign is dependent from the results of the previous ones. The detailed approach recommended for DRIVER is provided in Annex 4.

3.3 SP3 Civil society resilience

In SP3, all WPs worked on the selection, reflection and adaptation of appropriate solutions for the experimentation campaigns that have been designed within each work package. Moreover, SP3 as a whole created a common framework that links these selected activities and provides connections to the overall DRIVER storyline. In these first 10 month, also several working relations to solutions and experiments in SP4 and SP5 have been established that allow looking forward towards joint experimentation activities in the future.

This preparatory work in SP3 has led to a modification of the title: the addition of the word 'society'. This is generally reflective of an intense work on conceptualisation, which in turn reflects that the inclusion of a significant element of resilience in an also response-oriented project like DRIVER is a significant development in its own right.

3.3.1 Towards a civil society resilience framework (WP31)

The conceptualisation within SP3 can be summarised as follows: DRIVER as a whole sets a clear focus on crisis management, thus does not consider environmental aspects or economic development or other resilience dimensions in its core activities. In addition, the clear scope of DRIVER is on Europe. That means it is a resilience approach for developed countries, which we assume to have a basic level of infrastructure, governance and education compared to developing countries. Moreover, DRIVER takes a focus dedicated and tailored to Europe, since resilience culture and discussion differs from experiences in the US or Australia.

Already in the proposal phase, the definition of resilience as phrased by the International Federation of Red Cross and Red Crescent Societies (IFRC) provided a common reference for resilience interpretation by the involved SP3 partners: here resilience is understood as "the ability of individuals, communities, organisations, or countries exposed to disasters […] to: a) anticipate b) reduce the impact of, c) cope with d) and recover from the effects of adversity without compromising their long-term prospects." [2] Subsequently DRIVER has come to prefer the UNISDR definition of resilience as the "ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions." [3]

This look at abilities refers to a set of capacities by persons and organisations. We assume that resilience has two complementary dimensions, being a status of a system and also as a process to become more able to anticipate, reduce, cope and recover. However, both dimensions are hard to measure and observe, since they are influenced by many factors that cannot be completely

controlled. Thus, it is always relevant to clearly state the assumed context conditions for solutions and experiments, and to be careful with generalisations.

During the SP3 discussions, it became clear that there is need to specify potential differences in the wording with respect to civil resilience, civil society resilience and societal resilience. Both, civil and **civil society resilience** refers in the crisis management context to the resilience of actors outside the professional response such as individuals, communities or cities. The term more used in academic discourses is civil society resilience, while civil resilience is hardly used outside of DRIVER. Thus we will be using the term civil society resilience to describe the activities of SP3. In contrast the term **societal resilience** constitutes an overarching concept that refers to the value-dimension of society as a whole. In that distinction, SP9 takes the societal resilience perspective and considers the value-dimension of the civil society solutions developed by SP3.

SP3 thus has its focus on the civil actors of society that are not crisis management experts, but can contribute to crisis management somehow. In this sense, the local government is understood as one important player especially with its non-crisis-management activities and as a managing organisation for citizens' engagement. This interpretation of civil society includes also the activities of crisis management experts that aim to address or activate non-crisis-management entities.

SP3 is experimentation driven and thus needs to **concentrate on some core challenges**. The system to be investigated in SP3 can be structured towards three levels of the society's organisation: individual, community and local governance. In addition SP3 is paying special attention to crisis communication and the mobilization of citizens as volunteers. With these emphases, core crisis management improvement areas are tackled. At the same time we are aware that this covers only part of the overall civil society resilience arena, since for example the role of educational systems, companies or infrastructure providers is not addressed (see Figure 2).

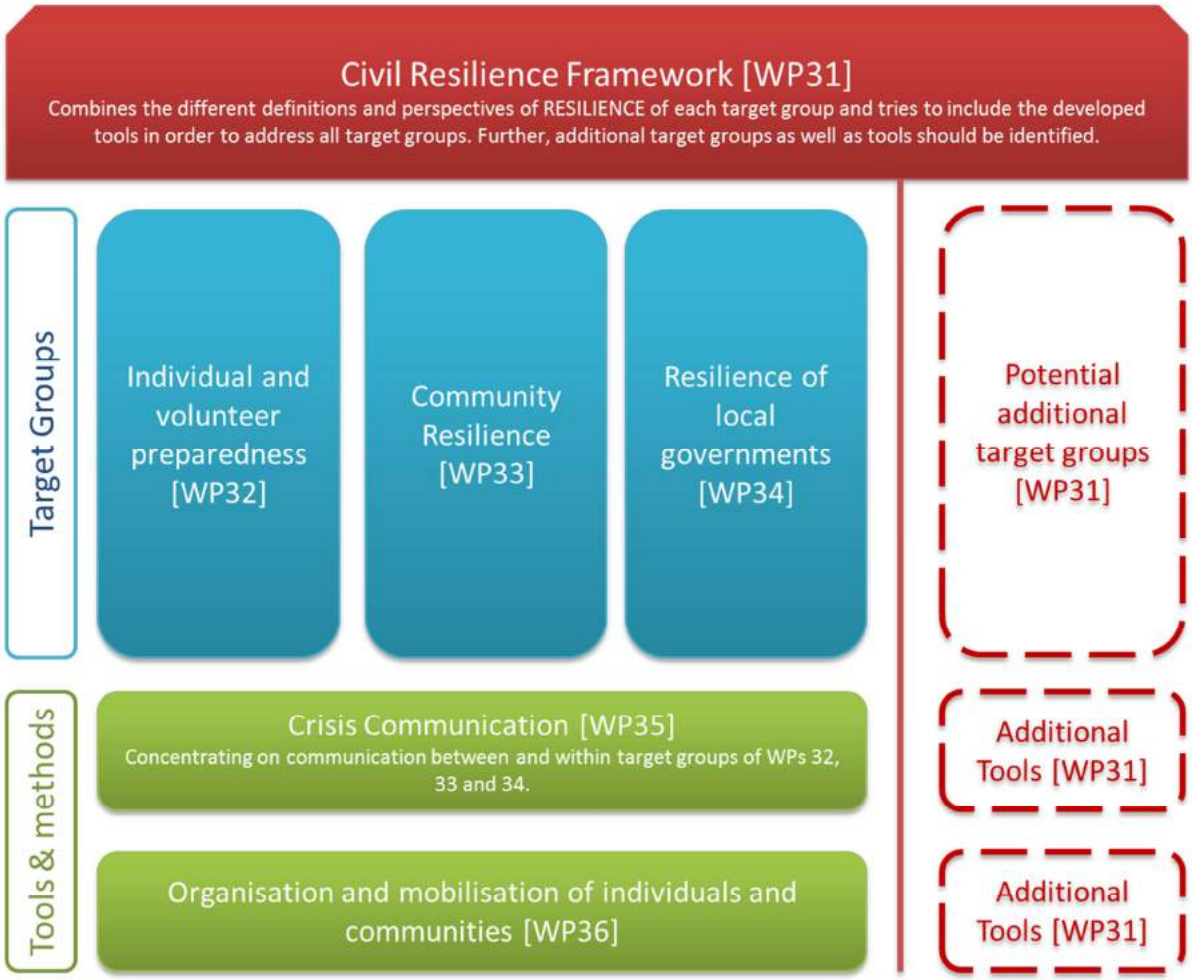

Figure 2: Civil society resilience solutions in DRIVER SP3

The intention of this restriction of the SP3 activities to a **local level** is to stay closer to the level of major involvement of citizens. Also during regional, national or even international crisis situations, there is a major part of response happening and organised at a local level, especially when looking at the civil society activities. Further, the local view does not exclude the consideration of people that are connected on a national or even international level. And it is well known that state, national and EU parliaments set rules and its administrations provide support (at least in the ideal cases) for activities on the local level.

SP3 starts from functional consideration and is based on existing concepts and approaches. The general intention is to provide solutions applicable in Europe. However, it is clear that there are huge cultural and legal differences throughout the EU member states which do not allow to assume that one solution can be applied everywhere. Experimentation and expert discussions are expected to reflect, test and evaluate them in several specific contexts throughout Europe.

3.3.2 Best practices, methods and tools as well as experimentation planning for enhancing civil society resilience

Operationalising civil society resilience is a key objective of the DRIVER SP3 activities within the framework that is elaborated and applied by WP31 after critical reflection of existing approaches. Thus all the following work packages had a closer look at several existing solutions (concepts, methods and tools) and selected the ones that will be tested in the subproject experimentation campaigns, with the aim to enhance various aspects of resilience. In order to identify such good practice tools, concepts or methods WP32-WP36 conducted a state of the art analysis (SOTA) identifying and further refining the available solutions. This allowed and enabled the more specific design of the experiments, which is documented in uniformly structured work plans in the progress reporting of SP3 (D31.11 in month 6, and updated in D31.12 in month 12).

3.3.2.1 Improving individual resilience and preparing volunteers (WP32)

WP32 addresses the resilience of individuals as well as affiliated volunteers before, during and after disaster. Disasters do not only cause material damage and loss of life. They also leave invisible scars that may be difficult to heal such as human suffering, psychological hardship and social disruption. The provision of timely and appropriate psychosocial support can not only mitigate the human suffering in the short- to medium term but also facilitate recovery and rebuild individual and community resilience in the longer term. Psychosocial support is therefore a way to increase resilience of individuals and volunteers involved in disasters. WP32 tests a total of three training kits aimed at improving psychosocial resilience of individuals and affiliated volunteers. The main aim of this WP is optimizing these solutions and adapting them to specific local, regional and national frame conditions. Therefore the training kits will be tested in different localities.

The research question is to test the effectiveness of the cascading model as a useful method for transferring psychosocial knowledge to volunteers in crisis management organisations. We hypothesize that the cascading model is an effective method to facilitate learning among volunteers and enable the volunteers to implement their knowledge in their role as crisis responders.

The underlying scenario is that In the event of an emergency, the Red Cross and Red Crescent National Societies will be able to implement a cascade model when using the Psychosocial Support Toolkits, thereby reaching more beneficiaries. For that purpose, well known existing toolkits have been selected, since not these toolkits but the transfer approaches are in the focus of WP32.

The first experiment with the toolkit for Community-based Psychosocial Support will be implemented in a Training of Trainers (ToT) methodology composed of three tiers of trainings (i.e., cascading model) to be conducted with participants from Magen David Adom (MDA).

The second experiment uses a toolkit for sports & physical activity based psychosocial support, which is implemented in a Training of Trainers (ToT) methodology composed of two tiers of trainings (i.e., cascading model) with participants from the British Red Cross' branch in Northern Scotland.

A third experiment will test a Caring for Volunteers Support Toolkit with volunteer managers and supervisors from Magen David Adom (MDA) during a two-day training conducted by a specialist from

the Red Cross Psychosocial Centre. The expected outcome is to gain an insight into the benefits of the training and how it would impact the organisation.

3.3.2.2 Assessing and enhancing communities' resilience (WP33)

WP33 aims to assess and enhance the communities' resilience against disasters by consolidating existing assessment, developing recommendations for the community cooperation and defining criteria for strengthening the community. SP3 understands communities as social units, going beyond the individual resilience and referring to networks and cooperation within the population besides governmental agencies. Community refers to social units, which often have but do not necessarily have spatial (geographical) relations. Measurement tools, participatory methods for triggering actions and guidelines for professionals are applied and evaluated in this WP. Until this milestones, several concepts, methods and tools have been analysed and selected, around which now the experiments in this WP are designed.

In a scenario such as flooding, it is assumed that citizens from highly resilient areas are well prepared and able to survive the flooding for a week without professional support. Self-reliance of citizens could be predicted on the basis of our community resilience model. A first experiment therefore has been designed to test a questionnaire of Paton (based on his Community Engagement Theory) that measures community resilience at three levels: individual (e.g., situation assessment), community (e.g., social support) and societal (e.g., trust). The approach has been selected after comparing several available solutions based on its reliable design and the open issue of its transferability to the European context. This questionnaire will be administered in The Hague so as to predict citizen preparedness and to measure community resilience on the basis of validated indicators. This does not require specific infrastructure, but is done in cooperation with the partners of The Hague DRIVER platform.

A second experiment has been designed to test a community engagement tool in 8 rural and urban communities of Scotland. The tool was based on an existing tool (CART) after a selection process of some available approaches based on its flexibility to different situations. In the experiment it will be measured whether awareness and behavioural intention are influenced by a workshop in which the tool was applied. Research questions are to test whether the tool is applicable in a European context and in rural and urban communities and to what extent it would affect awareness and behaviour. This will be done outside a DRIVER platform.

A third experiment has been designed to use a dashboard on the basis of relevant indicators for community resilience. The underlying assumption is that it might be useful for a professional to know the key persons in community networks to be able to (quickly) mobilize a (coordinated) group to for example place sandbags in case of a flooding, or to have an idea of demographic variables (age, cultural diversity) to be better prepared for the type of community. Perhaps cooperation with citizens is most pronounced in the recovery phase as there is presumably more room for citizen engagement. In several focus groups we will discuss the relevance of knowing a community's level of resilience and implications for professional procedures. The goal of the experiment is to gain insight into the implications of increased community resilience for professional action. Since not the specific content, but the approach of the dashboard are in focus, an existing dashboard by the researchers

has been adapted for this purpose without a major selection process. For easy access to stakeholders, the experiment will be done in cooperation with the DRIVER platform of The Hague.

3.3.2.3 Assessing and enhancing local governments' resilience (WP34)

WP34 broadens the perspective on the actors of local societal civil resilience by including local governments in the research and framework development. Therefore the work package addresses actions, decisions and processes of institutions and authorities in order to support local resilience. This specifically includes self-assessment methodologies and participation as well as communication processes involving the target groups of WPs 32, 33 and 36. This WP took a close look on many available approaches and combined selected elements of existing approaches to a comprehensive method for assessing and improving the resilience within a city's territory.

The experiments are designed to allow testing and improving a DRIVER local government resilience assessment method for crisis management, evaluating the functionality and applicability of the method. This solution has been developed after carefully comparing available solutions and adapting useful elements to the targeted audience and purpose.

A first set of experiments is designed to test the usability of the DRIVER assessment methodology (operational evaluation), with the research questions: Can the targeted end-users and assessment participants perform the method as intended? Are the selected indicators adequate? Are the provided technological support tools adequate? Moreover, the impact of the assessment tool is addressed: are the end-users and participants of the assessment method empowered to improve the local resilience? Do they have a better/ common understanding of existing gaps and problems?

The first round of experiments is designed with the involvement of stakeholders related to several of the DRIVER platforms and to check selected elements of the overall approach. In a second round, the full methodology will be applied in an extended process within one particular city in the South of France, attached to the DRIVER platform of Pole Risk.

3.3.2.4 Improving communication before, during and after disasters (WP35)

WP35 addresses communication activities before, during and after crisis situations. Therefore the WP provides an overview regarding current research, strategies and practices and their effectiveness, to develop a stakeholder map of crisis communication and to propose methods to raise the awareness of specific target groups. All such solutions are currently further specified, and the related experimentation activities are designed.

The role of the WP within the overall civil resilience framework of SP3 can be designated as a connecting piece. Crisis communication is relevant within and between all target groups of the WPs 32, 33 and 34 and further plays a crucial role when organising and mobilizing individuals and communities as aimed in WP36. Further, by experimenting with best practices the work package aims to provide tools to support effective measures to warn the public and raise awareness.

Regarded the designed experiments, the assumed scenario for the first experiment is a widespread flooding impacting on many countries at the same time. Initial flooding is followed quickly by a flood-related public health scare. Warning messages relating to the scenario have to be distributed. In such a case, designing messages which are impactful for different stakeholder groups is an important challenge. The first experiment will therefore adapt a tool of Message Mapping widely used to prepare for public health emergencies. Focus groups will be used to identify distinct information needs of groups, effective channels of communication and the effectiveness of short warning messages. The research question is to validate the effectiveness of a method for identifying the distinct informational needs and effective warnings for different stakeholder groups and, thereby, provide a practical methodology for use by organisations charged with communicating with the public at all stages of the disaster management cycle.

Based on a thorough evaluation of best practices and communication cases across Europe as well as existing communication materials, a short and flexible training course has been developed to transfer the key principles and best practices of communication for civil society resilience to high level crisis communication practitioners. The research question of the second experiment is to validate the usefulness and effectiveness of such a short training course. The design of this experiment addresses the gap between theory and useable practice for the practitioners of communication for civil society resilience.

The third experimentation activity in WP35 has been designed to test a DRIVER crisis communication assessment tool for reflecting the functionality and applicability of communication strategies. This aims to understand needs and problems in the existing crisis communication guidelines and scorecards. Here a special focus is on scenario independent clarification of the available communication means and approaches. All the experiments are independent from platform infrastructures, but could take place in relation to the DRIVER platforms as well.

3.3.2.5 Managing and integrating non-DM volunteers (WP36)

WP36 aims to integrate, manage and organise people that have not been trained for disaster management (DM). In this context it addresses different types of such non-DM volunteers and their specific needs, aiming at the development of a consolidated concept. Following this, the experimentations with the named methods and tools are designed in a way that they will focus on Lessons learnt, usability aspects and adaption strategies towards a common solution. Within the overall SP3 framework, WP36 is strongly connected to all other WPs. Not only does it address the two target groups of the WPs 32 and 33, rather it needs to include the communication solutions developed by WP35. Additionally, the output of this WP can be used in the solutions of the WPs 33 and 34, since they seek to assess resilience in cooperation with different actors.

Based on a reflection of existing concepts for spontaneous volunteer management, the first experiment is designed to allow testing a variety of concepts. Such concepts cover the integration of volunteer communities outside crisis management as well as individual spontaneous volunteers into crisis management activities. The intention of all such concepts is to minimise efforts to incorporate such helpers. The research question is to compare preparedness and response phase based organisation concepts (such as Team Österreich and Vapepa) with response phase only based

organisation concepts (such as Volunteer Reception Centre) – the relevant solutions have been identified based on a systematic comparison. The scenario for the designed experiment will be detailed according to the THW DRIVER platform conditions in a way that the participants may have to fulfil tasks such as physical work (e.g., sandbagging), coordinative task (team-building) or special skill task (e.g., translation). The conditions of the DRIVER platform are crucial here, e.g., regarding the scenario to be assumed, or the number of possible participants, evaluators and observers that can be hosted.

The second experimentation series has been designed around an existing and improved solution for tasking of the population via a smart phone app. The scenario in a first experiment is located in Vienna and assumes that exhausted refugees arrive in different cities in Austria without proper clothing for cold temperatures and volunteers are needed to first obtain an overview of the situation in different regions and second to offer their help by providing warm clothing, food and their workforce for distributing these items to refugees. For the second experiment in The Hague, we assume a flooding scenario of the coastal area.

The overall research question underlying the design of this second experimentation series in WP36 is to test in how far the crowd-tasking concept can be used to engage people with no prior history of volunteerism. More specifically the aim is to evaluate what role crowd-tasking can play in volunteer management with respect to the types of tasks and the crisis management lifecycle and to evaluate the usability and workflow of the CrowdTasker application.

The selected solution has been developed by the involved partners in a previous project and thus can now be easily adapted to the intended experiments. The experiments are constructed such that they provide a simulated reality for both, coordinators and volunteers. In this sense, they need support of appropriate simulation infrastructures. They will take place both at a DRIVER platform (The Hague) and outside a platform at the premises and with the support of another DRIVER end-user (Vienna).

3.4 SP4 Strengthened responders

This section is structured in one part (3.4.1) reflecting the situation slightly after MS1 (M12 as opposed to M10) and another (3.4.2) summarising the state of planning at M17 (September 2015), providing a more complete picture with respect to the SP4 results contributing to the SE2 design and planning.

3.4.1 Status of SP4 at M12

A state of the art is being completed which will update the description of operational gaps from ACRIMAS, to be addressed by DRIVER. This state of the art will be complemented by a prospective (2025) vision of response tools, taking into account the major technological and societal trends relevant to the responders' community.

An initial inventory of the tools provided by SP4 partners has been performed, collecting the technical characteristics (technology, ability to interoperate) and functional coverage of the tools proposed by DRIVER partners as candidates for the SE2 experiments. This action has been

coordinated at SP4 level in order to take into account the fact that many tools have a functional coverage that covers several tasks.

This process led to a one week meeting at Pole Risques during the last week of November 2014, which enabled all SP4 partners and other DRIVER guests, including many end-user partners, to attend structured demonstrations of each SP4 tool and participate in end-users presentation and concluding SE2 design workshops.

The main objectives of this process were to better understand the available tools in the consortium and help designing the Subproject Experiment 2 (SE2).

As a result it was produced:

- a mapping of these 30 tools on the work packages WP43 Situation assessment, WP44 Tasking and resource management and WP45 Secured interoperability tasks, each of these task addressing an operational gap (as identified by ACRIMAS).
- some initial design of SE2 experiments
- a detailed evaluation of the functional coverage, technological characteristics, maturity and relevance of the each tool on its major functional domain.

The results are summarised in Figure 3: Summary of results from SP4 meeting.

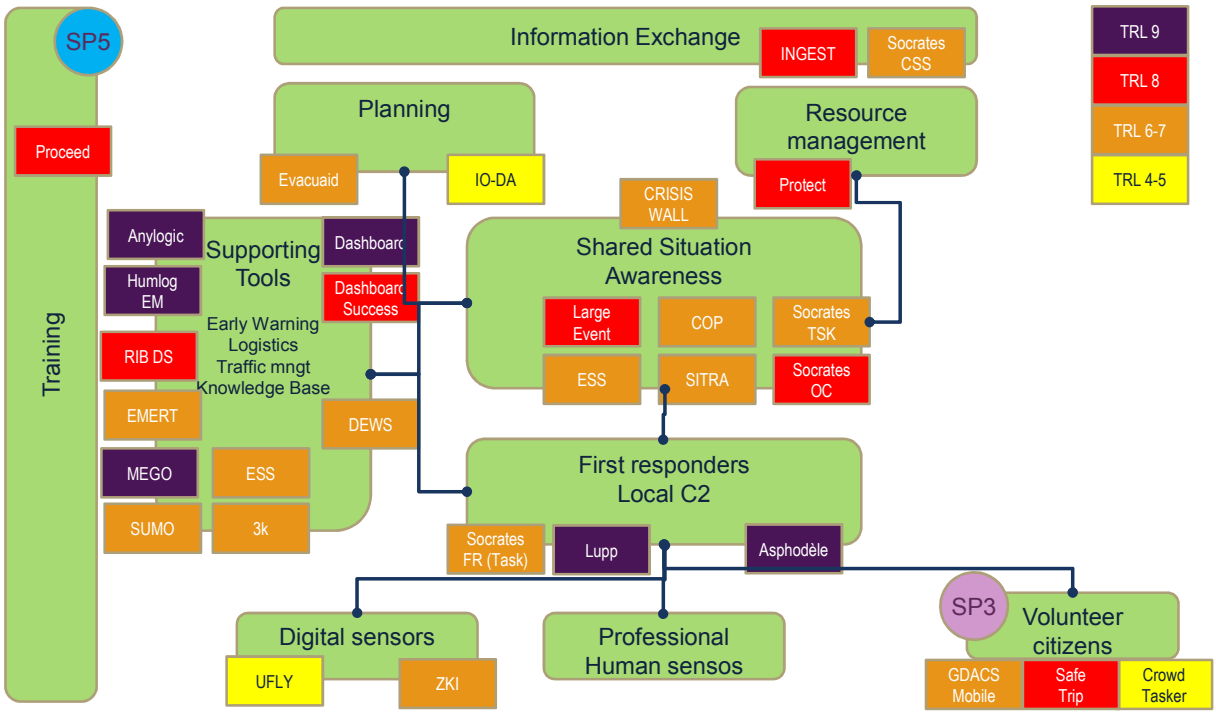

Figure 3: Summary of results from SP4 meeting

Some structuring ideas have emerged from the wrap-up workshop: like the assignment of an experiment committee (composed of supporting SPs) for each experiment, the necessity for experiments to put the focus on the type of solution rather than on a specific tool of such or such

provider or the opportunity to include interoperability as one dimension of other experiments rather than having specific experiments.

The event at Pole Risques was also the occasion to welcome presentations from DRIVER platform owners and from major local end-users (Marseille Fire-Brigade and South of France Civil Security Staff).

It has been also a major occasion for SP4 partners to meet as well as to exchange with other SPs partners. In this respect it has been also a fruitful teambuilding experience for the SE2 campaign.

The global executive summary of this process of inventory is described in the document D41.1.1 – Initial Inventory of Tools SP4 level experimentation report.

At M12, SP4 SE2 will consist of five large experiments to be held between late spring or summer 2015 and summer 2016 (working titles and platform allocation; see Figure 4):

- **EXPE41: operational data lift (lead TCS, platform: Pole/EPLFM)**: optimizing the information workflow between local and higher levels of command
- **EXPE42: interaction with citizens and volunteers (lead FRQ, platform CTH)**: optimizing the process throughout all phases of CM
- **EXPE43: from planning to tasking (resource allocation) (lead GMV, platform: MSB, ITTI)**: optimizing the resource allocation throughout the crisis cycle, with a cross border coordination facet
- **EXPE44: enhanced logistics (lead ATOS, platform THW)):** optimizing the role of logistics in preparedness and response
- **EXPE45: situation assessment & crisis dynamics (lead JRC, platform: JRC):** optimizing situation assessment and crisis dynamics

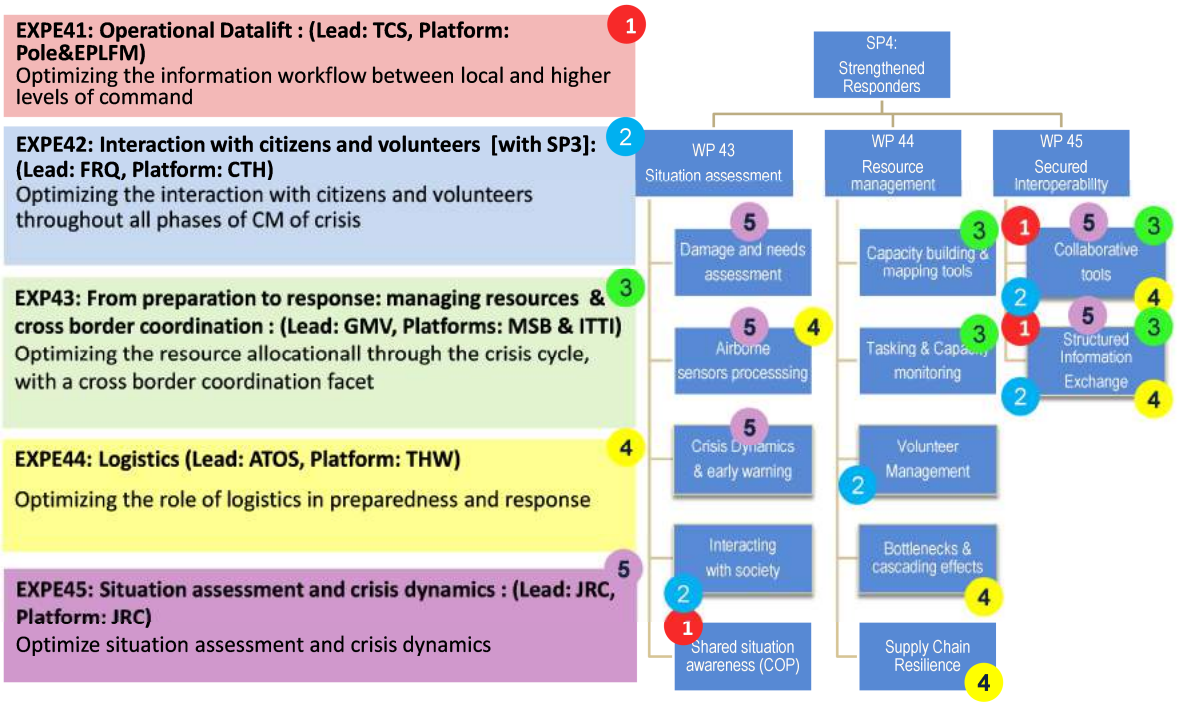

Figure 4: The SP4 experiments of SE2 (and task involvement)

The hosting platforms for experimentations have been decided at Ispra meeting (February 2-6, 2015).

Experiment leaders have the responsibility with WP and task leaders to define the experiment use cases. This use case will be designed in close cooperation with the involved end-users, and primarily with the platform owner that will host the experiment. They will be supported by an experiment committee consisting of representatives of the supporting SPs (SP2 for hosting, methodological and supporting tools, SP7 for event organization, SP8 for aspects of capabilities, organisations, policies and legislation, and SP9 for ethical and societal aspects).

Further, in particular the interaction with citizens and volunteers experiment involves collaboration with SP3 – a joint element– already at the SE2 stage.

In parallel, the High level design of SP4 Architecture whose aim is to enable SP4 tools to interoperate in the experiment use-cases, has been initialised in close collaboration with the SP2 work on technical architecture.

At this point in time (M12) Task T43.2 and T43.5 were not assigned to specific experiments.

3.4.2 Status of SP4 experiment design – an emergent view M12-M17

During the second quarter of 2015, the following changes were brought to the experiment list of SP4: The work of T41.2 on Airborne sensor processing was called EXPE40. EXPE45 was split in two distinct experiments EXPE45 and EXPE46. Later on (third quarter of SP15) EXPE44 was also split in two, which became EXPE44 lead DLR and a Study on Logistics consisting on workshops lead by CITET.

In order to enhance the continuity with the current status, the following detailed reporting of the high level design includes this complete list.

Thus this section describes the status of the design of the SP4 experiments as seen in end of February 2015 (M10) for EXPE41, 42, 43, 44, 45, and 2nd quarter of 2015 for 40, 46 (M14) and 3rd quarter of 2015 for the Logistics Study (M17).

This design will evolve during the following months taking into account the hosting platform operational interest and expertise and the tool providers suggestions.

For all tasks, the research question associated to the experiments is the following:

- Do the solutions we experiment “work”?
- What operational benefit do they bring?
- What would be their impact?

3.4.2.1 EXPE 40: Airborne Sensor Processing

The objective of EXPE40 is to test and integrate selected components for airborne sensor processing, as well as data collection and analysis (information extraction). The aircraft will be an optionally piloted aircraft which simulates a UAV.

The criteria of success which have been defined are the following: successful integration of the airborne sensor suite, successful planning and operation of an optionally piloted flight with use of DLR's ground control station. The information flow between the involved tools will also be checked.

EXPE40 will execute a flight experiment and collect and process and analyse airborne sensor data.

The scenario will be a flooding in Braunschweig that affects the traffic infrastructure

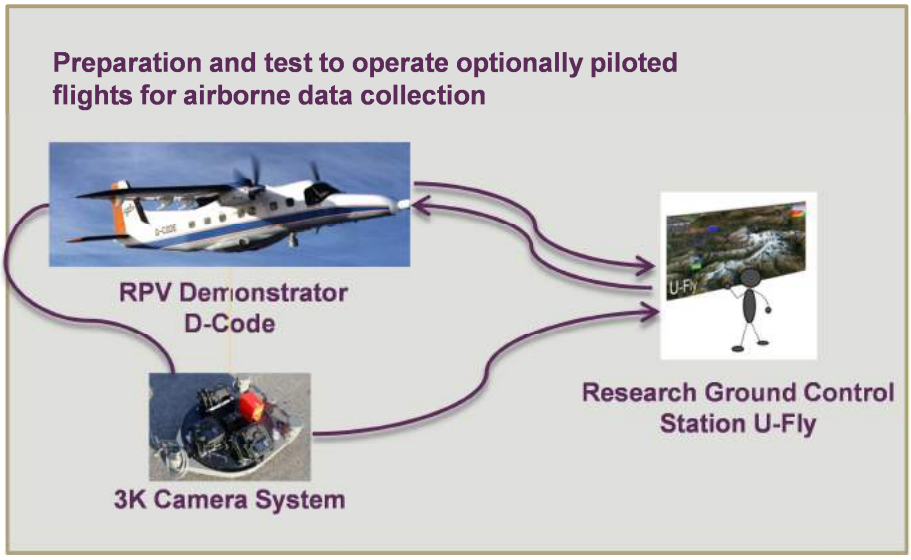

Figure 5: EXPE 40 main contributing systems

3.4.2.2 EXPE 41: Operational data lift

The idea of EXPE41 emerged from the presentation of an EMIZ (Etat Major Interministériel de Zone) commanding officer during the Inventory of tool meeting in Aix who described a very specific gap his organization was facing and that was related to the "Shared situation awareness".

The hosting platform of EXPE41 is Valabre.

The expected benefit brought by this solution is to improve the elaboration of Common Operational Pictures in higher levels of command (main focus: regional level).

The success criteria which have been defined are a higher quality of information, lesser effort, and a better dissemination.

EXPE41 will compare the current process (legacy system) with process coming from DRIVER tools.

The Scenario will be a forest fire with cascading effects and the players will be officers from the Fire Brigade and Police.

The following tool providers will be involved: Thales, Frequentis, MSB, JRC, GMV, POLE, Valabre.

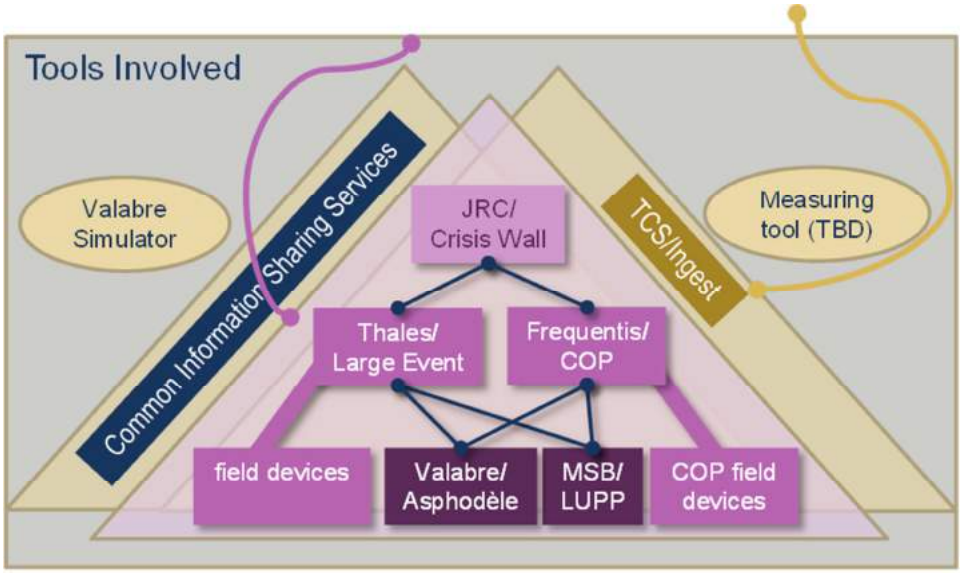

Figure 6: EXPE41 operational tools involved

3.4.2.3 EXPE 42: Interaction with citizens and volunteers

The objective of EXPE42 is to assess some solutions for the tasking and managing of volunteers during the response phase, as well as for the information and warning of citizens about the crisis situation.

The Criteria of success which have been defined are the leveraging of the power of volunteers and the linking of information in the public with the actual situation awareness.

EXPE42 will use mobile apps for crowd tasking and addressing citizens in a defined area, based on the common operational picture.

The scenario will be the communication of responders with volunteers during a flood / tsunami / pandemic situation (to be decided).

Figure 7: EXPE 42 main operational tools

3.4.2.4 EXPE 43: From planning to tasking

The objective of EXPE42 is to test and assess the operational benefit of tasking and resource management solutions during the preparedness and response phases, including cross-border cooperation.

The criteria of success which have been defined are a better sharing of information, improved command and control, coordination and cooperation processes.

EXPE42 will compare current process with process with tools.

The scenario is still to be defined at this point.

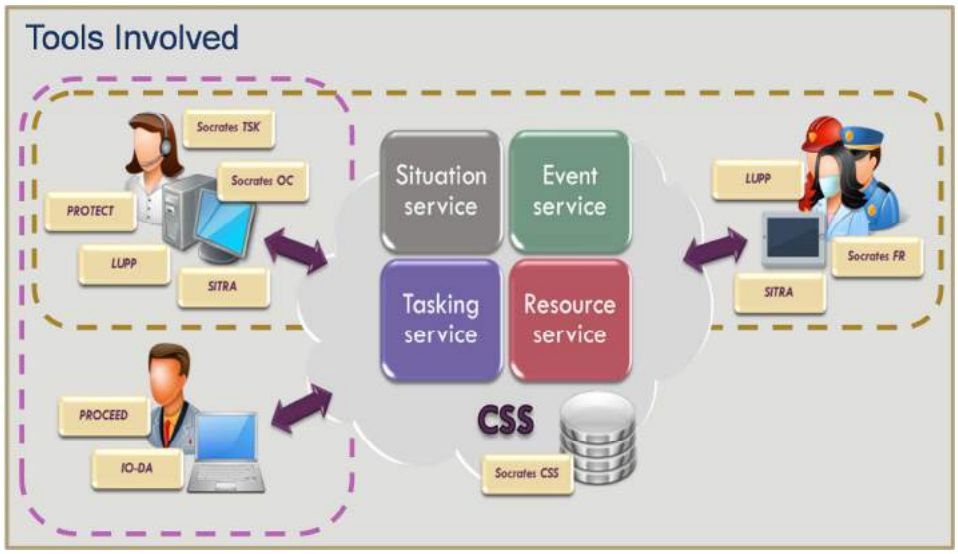

Figure 8: Main tools involved in EXPE43

3.4.2.5 EXPE 44: Enhanced logistics

The objective of EXPE44 is to test and assess the operational benefit of logistics solutions which enable the managing of resources during preparedness and operational supply chain (increasing the efficiency of the transportation) in crisis situation.

The success criteria which have been defined are the validation and test of logistics protocol and tools, and the improved sharing of information between public and private entities.

EXPE44 will compare the current process with the proposed tools and strategic preparation.

The scenario is to be defined with the chosen hosting partner.

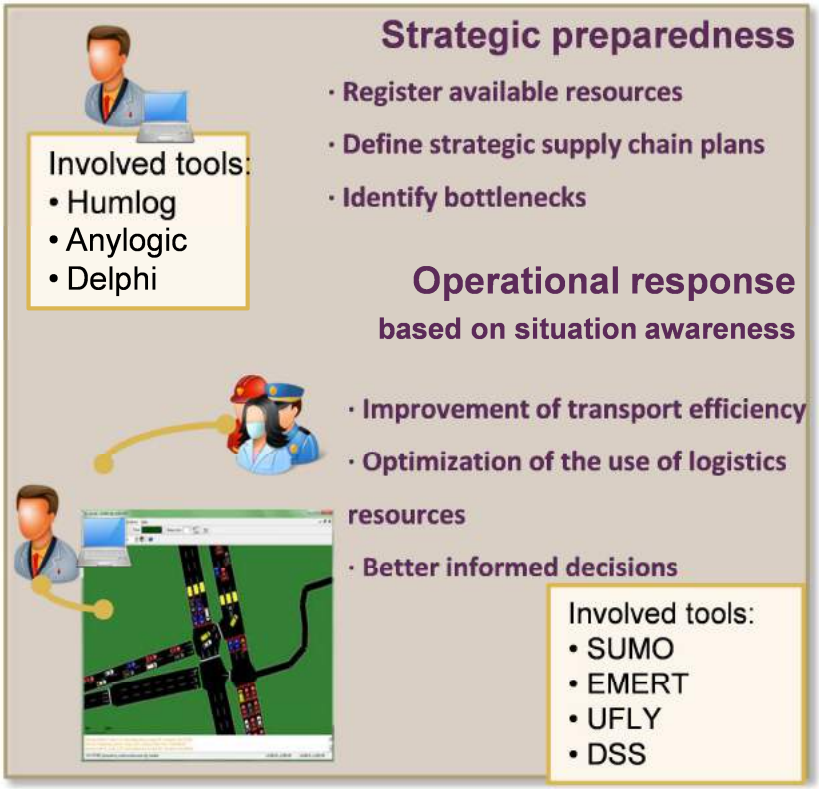

Figure 9: Tools involved in EXPE44

3.4.2.6 EXPE 45: Situation assessment & crisis dynamics (TBC by JRC)

EXPE45 aims at assessing the use of tools during the analysis of events leading to a potential crisis. This will involve the exploiting of existing legacy systems; therefore, the JRC platform European Crisis Management Laboratory (ECML) will be used, since it is already acting as a backend of the Emergency Response Coordination Centre (ERCC).

The experiment will evaluate each single tool and the assigned tasks, but also the outcomes that result from the integrated use of tools. For each tool main tasks that the tool is supposed to deal with, will be identified, and a success rate will be assigned. As far as the integrated use of tools is concern, the Experiment is split into three different levels of analysis. The common aim is to produce a valuable outcome (e.g., reports, graphical interfaces, alert messages) and to take informed decisions on the basis of the report produced.

The scenario will be based on various events, Tsunami, storm, tropical cyclone, and will use the JRC database and data models.

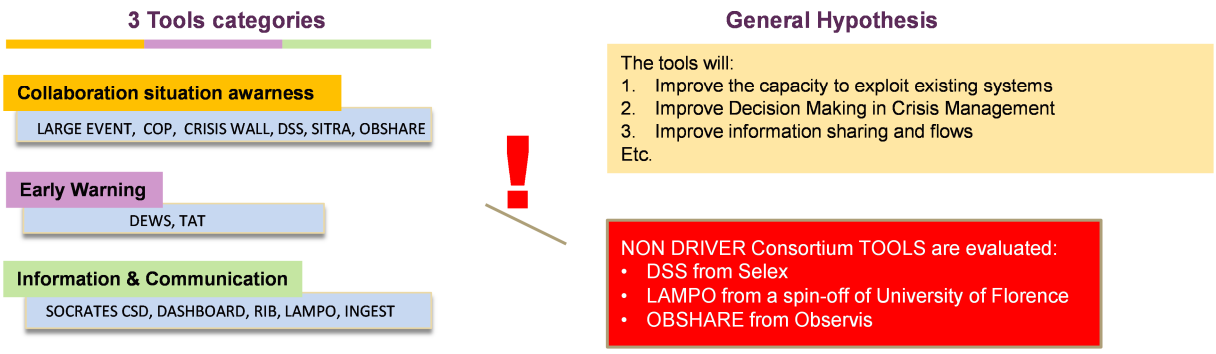

Figure 10: Operational tools involved in EXPE45

The design of the experiment will involve the tool provider, in order to create an "ad hoc" test including the evaluation criteria (common criterion: technological maturity level).

3.4.2.7 EXPE 46: Damage and needs assessment techniques using Nepal earthquake 2015 (TBC by JRC)

The experiments will be conducted within a defined scenario where 3 or 4 different methods/techniques for needs assessments will be used:

- remote sensing (e.g., damage assessment)
- social/standard media monitoring
- In field assessment

The event chosen as a scenario is the earthquake in Nepal: a large amount of data is available related to this event. It includes assessments from satellite and aerial imageries requested to the Copernicus service as well as on the results of field data gathering activities. This set of information will be used to compare the quantity, the quality and the completeness of information the tools could provide in similar situations, as well as the capacity of their integration to provide the crisis managers with enough information to perform the needed activities.

Comparing two objective mean to investigate the situation with media monitoring is interesting to compare the quality level that can be achieved in a small amount of time from a presumably unliterated and possibly biased source of information and if it is possible to rely upon that a prompter action.

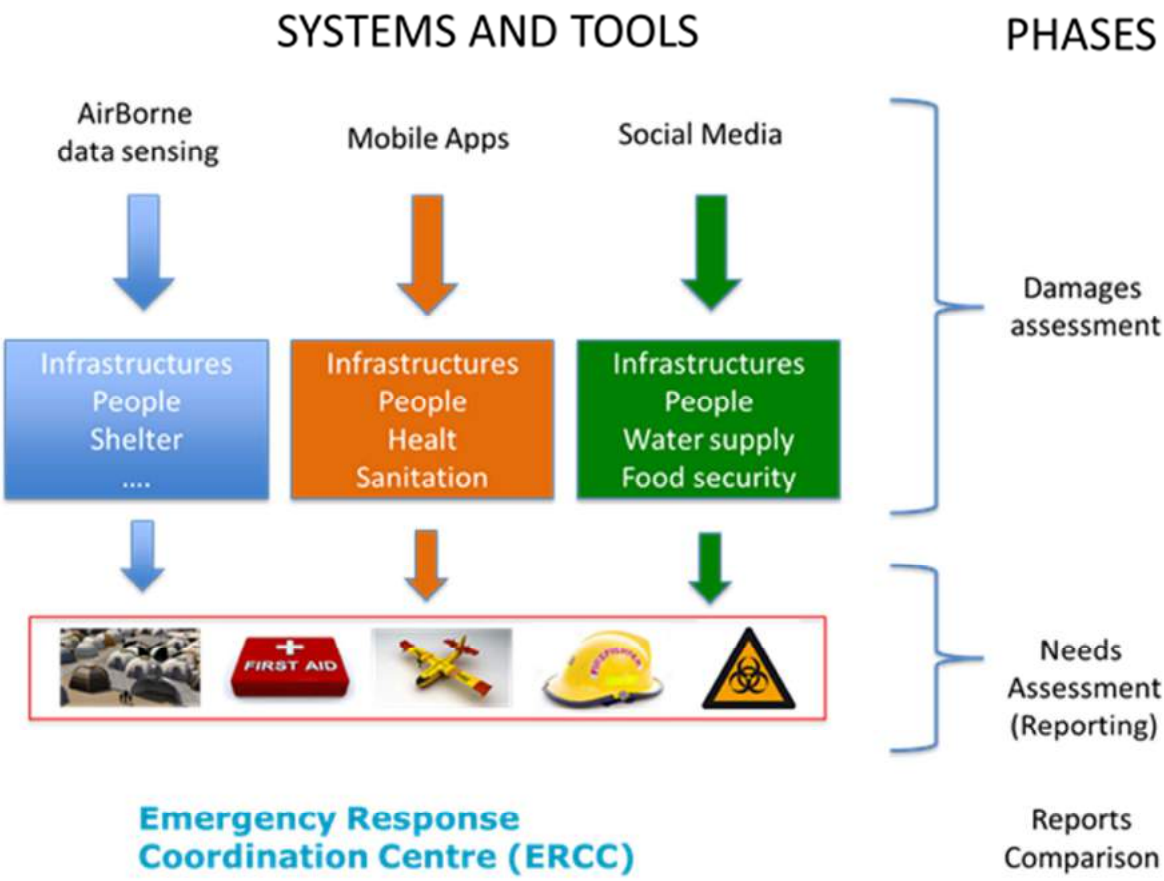

Figure 11: Principles of EXPE46

3.4.2.8 Study on Logistics

The objective of the task is to elaborate a recommended list of actions for logistics stakeholders and public entities that manages resources during preparedness and operates the supply chain during the response phase in the crisis situation.

This will be achieved through workshops involving end-users involved in the collaboration between the public and private logistic/transport entities in crisis situations.

The methodology is represented in the following figure.

Figure 12: Work methodology of D44.41

Methodology

The activities implemented in this task T440.3 were the design of the work methodology, expressed in the following figure:

Figure 13: Work methodology of D44.41

3.5 SP5 Training and learning

A crisis doesn't stop at the border (any border). This sentence is often written or said as a reason for first responder organisations to work together and to learn from each other.

Subproject 5 on Training and Learning, is about developing methods and tools to support and enhance learning activities of crisis management professionals (e.g., operational, tactical, regional and international).

It is our belief that learning and training are a great help in creating a shared understanding of crisis management throughout Europe. A shared understanding is not necessarily equal to similar working procedures and materials in all organisations, sectors and countries.

The following section provides an overview of the contribution of SP5 results to the SE2 design and planning. An elaborated SE2 planning at the time of the suspension of the DRIVER project is presented in Annex 5.

3.5.1 Content of the experimentation campaigns

During the SE1 period the focus was on identifying usable trainings and tools for the rest of the project. During this process, it became apparent that the project requires a suitable assessment methodology for the second campaign of experiments, joint experiments and Final Demonstration for the purpose of testing training solutions for high-level decision-makers across Europe and first responders who work with the general public. This can be either in terms of cooperation with bystanders or giving members of the general public psychological first aid. To be able to test these solutions and provide participants with the opportunity to learn, we need good insight into the current solutions and an assessment tool that can:

- help give training participants insight into what can be learned in a particular training, and
- support the DRIVER team and the participants in the systematic collection of feedback.

The focus of the SE2 campaign of experiments is to test selected trainings and tools in a cross-cultural and cross-sectoral way by holding sessions in different countries, with different populations of stakeholders. DRIVER partners from the field and research on crisis management will be invited to the tests of the solutions of the SP5 work packages. The following objectives have been identified as part of the SE2design.

Objective WP52 SE2: Test the efficiency and usability of the harmonised competence framework for the identified users. We will address different sets and combinations of modules of the developed competence framework. The focus here will be on assessing various dimensions. Importantly, we will look at how the framework is perceived by the users: is it valid, is it easy to use, how well does it apply to the participants' situation, is it fit-for-purpose? etc. In addition, we will request feedback on the framework on various dimensions: how pleasant and intuitive is the user interface, do the competencies match with those desired in CM professionals, how can it be implemented in the participants' organisations? etc. Finally, we will determine specific possibilities for improvement in terms of content, form and use. The ultimate goal is to develop a competence framework that helps CM organisations select candidates most suited to the work they will be doing, and provide a basis for further training and educating those professionals in the skills in which they can or need to grow.

Objective WP53 SE2: Test the efficiency and usability of tools chosen in Task T53.2 for identifying, analysing, adapting and generalising lessons. Lessons learnt is not just about keeping a logbook of what went wrong and how you would do things differently next time. Instead, it is about identifying things that went both wrong and right, defining what to keep and what to change in your operations. Moreover, Lessons learnt are about identifying ways to continually feedback these lessons into organisations and procedures in order to make CM the best it can be. In the next round of experiments, it will be important to receive feedback on the LL framework in order to make it as useful, applicable and valuable as possible. Perhaps even more important in the next round of experiments is, however, to raise awareness of the value of Lessons learnt and to make people aware of how they and their organisations can benefit from a more comprehensive Lessons learnt policy.

Objective WP54 SE2: Have feedback on the tool and training in two different training sessions in different settings (countries and functions) from the target audience. High level decision makers often reach their positions due to a wide variety of competencies that they have developed over years of experience. However, it is not possible for one person to be good at all things. In the case of decision making during a crisis situation, there is no room for underperformance. For this reason, it is essential to train high level decision makers in the decision making process, in the form that applies specifically to them, that is in a group situation, under (time) pressure, with human lives at stake. As with the rest of the SP5 solutions, the technical aspects of the training are important, but maybe more important is to raise awareness that with the special responsibility of a high level decision maker in a crisis situation comes a specific type of decision making, which is likely to be different from that to which they are accustomed in their everyday work. The experiments in WP54 focus on both the technical aspects of decision making, specifically as they relate to high level decision makers – as opposed to a more generic decision making process – and raising awareness that a high level role requires special and specific decision making skills.

Objective WP55 SE2: Check the usability of the developed trainings in different countries focused on the (perceived) effectiveness and change in attitude (with professionals). The general public may in some cases be a hindrance, but they are also a huge untapped resource during crisis situations. WP55 focusses on how to tap into this resource and apply it to CM in a beneficial and controlled way. In the other stream within WP55, we look at healing minds, as opposed to bodies. People involved in crisis can be scared and scarred mentally, but cannot be healed by conventional medical interventions. Specific psychological interventions are needed to help victims and bystanders deal with the crisis event and start on their way to processing what has happened to them. Experiments in WP55 will develop and refine the two trainings (working with the general public and psychological first aid) on the one hand, and actually implement the trainings on the other. The actual implementation has as goals: get feedback on and further refine the trainings and prepare the participants for better performance in both the joint experiments, Final Demonstration – and in real life CM.

3.6 SP7 Impact & sustainability

SP7 achievements have mainly been the establishment and operations of communications and event management routines. The particularity of these activities is related to the challenge of the size and the conceptual complexity of the DRIVER project, which imply a need for more sophisticated processes than most other FP7 projects. The main activities include amongst others:

- The development of a general dissemination strategy and roadmap and a comprehensive target stakeholder analysis.
- The set-up of the public project website and social media (notably LinkedIn).
- The preparation of public dissemination material (newsletter, flyer, project abstract, poster etc.).
- The set-up of a base of venues for DRIVER events.
- SP7 developed a first database based tool to collect registrations to the DRIVER Community. This database tool was rolled out and more than one hundred contacts were collected. This database will evolve into a comprehensive DRIVER Community management tool which is currently in development.

These tools will now be regularly revisited in view of progressively gearing them up as the project moves into a phase where the DRIVER consortium gives increasing importance to external engagement. As the DRIVER Concept evolves the dissemination strategy and roadmap will evolve with it.

In addition to this, first contacts were established with other CM research projects discussing future cooperation. These first contacts illustrated the importance of developing a clearly structured offer to third parties to participate in / interact with DRIVER.

The DRIVER Advisory Board was set up and the first DRIVER Advisory Board meeting was held on 29th and 30th January 2015. The discussion was rich and fruitful and the modalities of collaboration between the DRIVER Advisory Board and the project organized. The DRIVER Advisory Board members recommended that the results that were going to be available in the long-term after the project end should be more clearly developed, that the project should start to communicate more broadly and interconnect with existing networks and that the DRIVER Concept needed to be communicated more simply.

A vision paper on DRIVER sustainability was prepared jointly with SP8. This vision paper further developed the original concept of DRIVER Test-bed sustainability into a larger concept of a sustainable system including the distributed DRIVER Test-bed, the DRIVER Solutions and the DRIVER Community. This sustainability concept needs to be more deeply integrated with the DRIVER Concept as explained earlier in this MS1 report.

A Community of Users (CoU) event was co-organised with EDEN. The DRIVER project was presented to a large audience of disaster management stakeholders and in particular policy makers. Lessons learnt will be used to prepare the next CoU event.

3.7 SP8 Supporting information & analysis

The main role of SP8 is to enable operationalisation of crisis management solutions by analysing the non-technological environment of solutions or functions, which includes CM institutions, processes, capabilities as well as CM policy and CM related legislation. The CM innovation process fostered by DRIVER will further be supported by SP8 in proposing new standards for CM, and by providing necessary economic analysis needed to exploit the DRIVER CM solutions and to develop a business model for the sustainability of the Test-bed. First results on the way to reach these objectives are the following:

The work packages CM Institutions & capabilities and Governance have in close cooperation elaborated high-level information on CM procedural, organisational and institutional structures, as well as policy and legal aspects in EU Member states, selected neighbouring states and international organisations (EU, UN).

The studies cover issues on Organisation (e.g., chain of command, cross-border operational cooperation), Procedures (e.g., Standing operating procedures, national crisis management plans), and Capabilities (e.g., human resources, materiel resources). They further cover Policy (e.g., risk assessments, analytical support and R&D, financing, policy review cycle, approaches to resilience, information sharing and data protection) and Legislation (e.g., CM concept, general crisis/emergency/disaster management law, emergency rule, department/agency-level and specific regional and local legal arrangements, regulations on the involvement of volunteers and specialised NGOs, as well as for international engagements of first responders). They also provide data on CM organisations' procurement processes to support the exploitation of DRIVER solutions and the DRIVER Test-bed in SP7.

Besides general information, also first specific information needs that representatives of the receiving SPs (SP2-3-4-5) were already able to describe in the beginning the project, have been considered in the analysis. The next (update) phase will focus stronger on pertinent issues regarding DRIVER CM solutions. This is planned to lead to recommendations with regard to the implementation of DRIVER CM solutions under different conditions in terms of procedural, organisational and institutional structures, policy or legal requirements.

Further, a DRIVER internal document providing an overview of existing standards and standardisation activities in the field of CM on national, European and international level has been elaborated. It provides a basis for future standardisation activities in DRIVER and will be used to identify missing standardization activities and to give input to already on-going standardization activities.

With regard to the objective within SP8 to build the economic model and plans supporting the sustainability of the DRIVER Test-bed, a "vision paper" has been developed together with SP7, which will serve as a communication tool to engage stakeholders (most importantly the platform providers) incl. their management of the added value of DRIVER and the creation of a European Test-bed (cf. Section 3.7).

For the legal advice provided by SP8 with regard to experimentation, as well as with regard to the DRIVER tools, a "scoping paper" outlining the scope of topics addressed in this task has been drafted

(to be finalised). Legal advice is provided in terms of generic information, as well as upon ad hoc requests.

3.8 SP9 Independent monitoring

A main result of SP9 so far has been the development of a concept/framework for societal impact assessments to mitigate negative effects of the DRIVER CM tools and measures. An overarching aim of SP9 is mitigation of negative impacts to society thus to ensure that the DRIVER measures and tools produce as little unforeseen negative impacts on society as possible, through assessments of insecurities and secondary risks and societal costs. Based on CM measures and tools indicated in the DoW, it has already been possible to provide the first rounds of societal impact assessments. It can be noted that there are indeed overlaps between insecurities, secondary risks and societal costs, which in a way all relate fundamentally to insecurity.

Another main goal is to implement societal values into CM. We have identified opportunities to foster societal values, and a set of EU/RC/UN policies have already been screened to give insight in resilience-fostering CM activities. The iterations of this area and mitigation of negative impacts to society will be more operational and investigate how to make societal impact assessments easier integrated in the development of tools. This will include altering the categorization of tools and the criteria system, based on a better understanding of the concrete tools and measures, particularly gained by visiting the experimentation sites.

The content and results of the societal values area interlink with the work on training and education. Despite the early development status of this work, a number of preliminary findings have helped set the course for the ambitious research approach. These include the need to develop a common language through which actors can both engage, and, also have confidence that their contributions are valued by the project. Other objectives are to develop new and innovative paths to increase the circulation of knowledge, to bridge the gap between SP9 and other SP's, underlining that SP9 is more than an ethical "watchdog" within the project and to demonstrate the value the training and education work and embed it across the consortium. These objectives, it must be remembered, sit within a context that also includes logistical difficulties around accessibility to partners, facilitating the full participation of non-native English speakers. In response, the concept of societal governance has been developed.

The work on coordination and conceptualisation of independent monitoring and the Ethical and societal advisory board have identified and provided guidelines and templates regarding key ethical issues for the work and experiments conducted in DRIVER, i.e., relating to informed consent and research ethics approval applications. The first meeting of the DRIVER Ethical advisory board provided insights which will be helpful to coordinate and plan the rest of the project. An insight already made is that the task of monitoring ethical approvals and data protection obligations has demanded a lot of effort, and a novel approach will be suggested early 2015.

4 Subproject experimentation 2 – SE2

In this section, the MS1 definition – "SE2 design" – and the decision situation this issue posed to the DRIVER PMC is reported in Section 4.1. The main content of SE2 is provided in Section 3, but in addition Section 4.2 and Annex 1 summarise how the detailed preliminary experiment plans looked for SP3-4-5, and how this came together with SP2's platforms. Annex 2 follows SE2 up till suspension.

4.1 MS1 – SE2 design

The definition of MS1 according to the DoW reads: "SP Experiment 2 (SE2) design." The comments column says: "Means of verification: Peer review. This concerns SE2, definition of tool candidates, Test-bed assets, and scenarios to be used in SE2. Based on the Open Call 1 for needed assets not in the consortium."

The material as for tool candidates and scenarios – in some cases better described in terms of research questions – is outlined in the descriptions in Section 3 of SP3, 4 and 5. They also discuss the Test-bed assets, as does the SP2 section. Tool candidates and Test-bed assets were also considered in connection with the Open Call 1 foreseen in the DoW.

In general SP4 has the most demanding experiments in terms of both physical platforms and IT infrastructure. Platform hosting was in most cases a necessity here, while in both SP3 and SP5 the physical infrastructure demands were typically limited. However, platform partners could also here offer important services, e.g., in recruiting workshop participants from different countries and organisational backgrounds.

The 'peer review' decision whether or not to find the SE2 design adequate was considered at four face-to-face PMC meetings: Brussels 2014-11-17/18, Ispra 2015-02-02 and 06 (in connection with the G there), and Bonn 2015-02-24/25. In the process it was a key issue whether the experiment design needed additional solutions or Test-bed assets. It was decided that this was not the case and that no Open Call was needed for SE2. The project, however, intends to involve end-users/practitioners and solution providers external to the consortium through an alternative mechanism for future activities (dedicated Work Package 103 proposed as part of amended DoW), allowing the selection of several participants and solutions to be involved based on transparent criteria in order to ensure that the technological state of the art and relevant available knowledge will be taken into account.

Final PMC approval of the MS1 deliverable was then handled *per capsulam*.

4.2 Overview of SE2 planning at MS1

The SE2 plans list 3 experimentation activities in SP3-4-5.[8] They are of varying size and complexity, from one-day preparatory and assessment activities like workshops and focus group exercises, to large system-of-systems experiments. Fifteen are scheduled to begin during 2015 and 9 are planned to also finish before the end of that year. Only three activities take place in the first half of 2015, so the second half of 2015 will see a large number of parallel activities. Broken down for each of the thematic subprojects, SP3 has the largest number of experiments (16), most of them, however, quite limited in scope and complexity. SP4 plans include 6 activities, counting also the transversal experiment campaign that is scheduled partly to overlap with and prepare solutions for the Joint Experiments. The SP4 experiments are all quite large, focused on different high-level decision making function and involve solutions from several DRIVER partners. For SP5, only two experiments are currently planned to start in 2015, the remainder (7) taking place in the second half of the SE2 period.

These experimentation activities have evolved gradually, in number, scope, type and timing, and this process of successive refinement will continue. This is entirely in line with the DRIVER approach of experimentation, where the objective is to design balanced experiments, and outcomes of early activities influence plans for coming experiments. A consequence is that the SE2 plan delivered with this deliverable is not final, but subject to continuous refinement – and if necessary more thorough revision.

According to available information, 15 out of 32, of the planned experiments are scheduled to place on the DRIVER platforms. This is above the expectations made during the project proposal phase. This great interest to use the platforms right from the start is highly beneficial for the evolution of the DRIVER Test-bed. To some degree, it validates the project design, where common resources for supporting experiments are centralized in SP2, while the responsibility for thematic content and execution of the experiments lies in SP3-4-5-6. Still, the great demand for SP2 support needs careful coordination

During 2015, the SP2 support is mainly through the hosting of experiments and methodological support. The latter will be focused on evaluation of experiments and early campaign assessment, since this is the part of SP2 that is most mature and in need of validation in actual experiments. Additional support, e.g., modelling and simulation, automated data collection and tools for analysis are still in development and will be phased in progressively.

A number of project risks are associated with this high degree of activity, mostly related to availability of personnel and supporting resources. The Experimentation coordination group was conceived to handle these risks, assure an efficient use of resources and successful execution of all experimentation activities. The group, chaired by the Technical coordinator and having SP2-3-4-5-6 leaders as its core members, convenes monthly by conference calls.[9]

[8] There was a miscalculation in the original D13.2 such that one more experiment was erroneously attributed to SP3.

[9] See Annex 2 for information on scheduling and implementation of SE2 up till the time of suspension. The substantive results of the performed SE2 experiments are discussed in the MS2 report, D6.1.

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Annex 1: Overview of SE2 planning at MS1

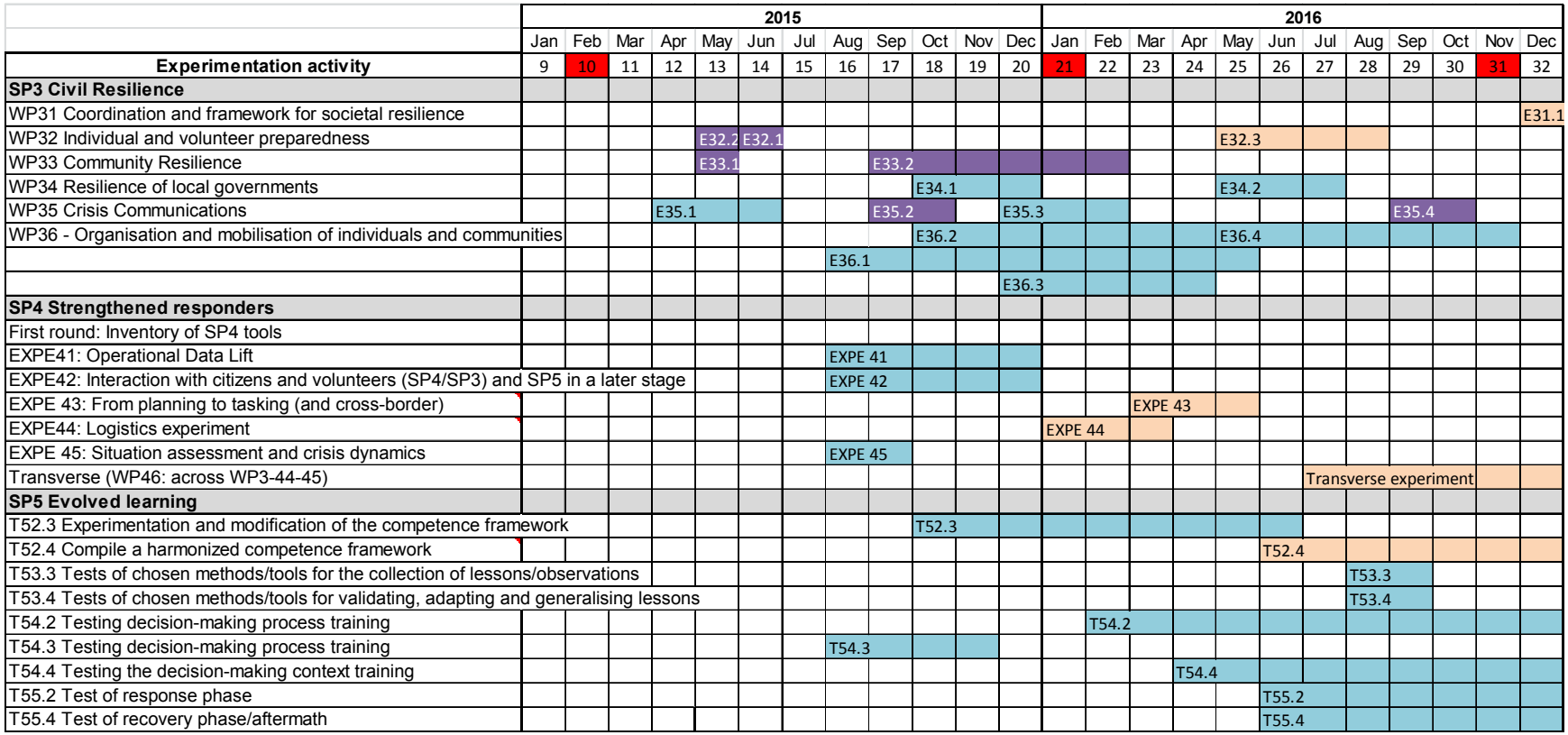

Figure 14: Overview of SE2 period experimentation activities as of MS1

Annex 2: Detailed situation of SE2 scheduling/implementation at the time of suspension

SP	ID	Name	Time (February 2015)	Time (March 2016)	Place or Platform
SP3	**E31.1**	Joint experimentation	M32–M41	M32–M41	
SP3	**E32.1**	Testing of Community-based Psychosocial Support toolkit	Jun 2015	**Tier 1: 2015-06-08 to 2015-06-13,** **Tier 2: 2015-09-02/03,** **Tier 3: Oct-Jan 2016**	Copenhagen, Denmark Tel Aviv, Israel Various locations Israel
SP3	**E32.2**	Testing of sports and physical activity based toolkit for psychosocial support	May 2015	**Tier 2: 2015-05-09/10** **Tier 3: May–Oct 2015**	Inverness, Northern Scotland
SP3	**E32.3**	Testing of a toolkit for preparedness of volunteers	May–Aug 2016	**2016-03-02/03**	Tel Aviv, Israel
SP3	**E33.1**	Measuring community resilience	May 2015	**2015-08-21; 2015-12-16; 2015-12-20**	Inverness (UK)
SP3	**E33.2**	Engaging Communities	Sep 2015–Feb 2016	**Aug–Dec 2015 (multiple dates)**	Scotland (Inverness etc.), UK
SP3	**E33.3**	Resilience and social networks	No date	**2015-08-21; 2015-12-16; 2015-12-20**	Inverness (UK)
SP3	**E34.1**	DRIVER Method 0.1 Experiment	Oct–Dec 2015	**2016-01-25,** Lund (Sweden) **2016-04-18 to 2016-04-22**, Cannes	DRIVER Platform cities & tool using cities (E34.1a THG, E34.1b Pôle,E34.1c ITTI)
SP3	**E34.2**	DRIVER Method 0.9 Experiment	May–Jul 2016	M28–M30; Aug–Oct 2016	Nice (POLE)
SP3	**E35.1**	Stakeholder Message Mapping	Apr–Jun 2015	**June 2015,** **Oct 2015,** (Multiple dates) Nov 2016	Ireland, Germany (Multiple places)

SP3	**E35.2**	Crisis Communications Training for Media and Public Policy Stakeholders	Sep–Oct 2015	**2015-11-30, 2015-12-14**	Dublin (IE)
SP3	**E35.3**	Testing of Assessment Tool for Alerting Technologies	Dec 2015–Feb 2016	**May 2016**	Stuttgart (Germany)
SP3	**E35.4**	Raising Preparedness of Target Group in Civil Society - Testing of Public Relations Campaign	Sep–Oct 2016	Jan–Feb 2017	Galway (Ireland)
SP3	**E36.1**	Test concepts for integration of volunteer communities outside CM & individual spontaneous volunteers into the response	Aug 2015–May 2016	**E36.1a: 2015-12-09** **E36.1b: 2016-01-11** E36.1c: 2016-07-01 to 2016-07-03	E36.1a Germany, Berlin E36.1b Israel, MDA E36.1c Germany, Hoya, THW
SP3	**E36.2**	Experimenting with mobile application for crowd tasking of individuals (cf. E42)	Oct 2015–Apr 2016 (E36.2 and E36.3)	**E36.2a: 2016-01-11** **E36.2b: 2016-02-11/12** **E36.2c: 2016-04-19/20**	E36.2a Israel, Tel Aviv, MDA E36.2b Vienna E36.2c The Hague
SP3	**E36.3**	Integration experiment - DISCONTINUED	May–Nov 2016 (E36.4)	Integration experiment discontinued – part of JE	

Table 1: SE2 plans for SP3 Civil society resilience, time of suspension (boldface: completed)

SP	ID	Name	Time (February 2015)	Time (March 2016)	Place or Platform
SP4	**E40**	Airborne Sensors	New	**2015-09-09 to 2015-09-11**	DLR Braunschweig, Germany
SP4	**E41**	Operational Data Lift	Aug–Dec 2015	**2016-03-01 to 2016-03-03**	POLE (EPFLM), Aix-en-Provence (France)
SP4	**E42**	Interaction with citizens and volunteers (SP4/SP3 – E36.2) and SP5 in a later stage	Aug–Dec 2015	**2016-01-10 to 2016-01-14** **2016-02-11/12** **2016-04-19/20**	**Tel Aviv,** **Vienna,** **THG, The Hague**
SP4	**E43**	From planning to tasking (and cross-border)	Mar–May 2016	**2016-04-25 to 2016-04-29**	MSB+ITTI
SP4	**E44**	Logistics experiment	Jan–Apr 2016	**2016-03-07 to 2016-03-09 (Rehearsal)** 2016-06-06 to 2016-06-10 (Execution)	DLR Braunschweig Neuhausen (Germany)
SP4	**E45**	Situation assessment and crisis dynamics	New	(Ongoing activities up to June 2016)	JRC
SP4	**E46**	Damage and needs assessment	Aug–Sep 2015	**last week of Feb (workshop)**, May 2016 (Damage and needs assessment)	JRC

Table 2: SE2 plans for SP4 Strengthened responders, time of suspension (boldface: completed)

SP	ID	Name	Time (February 2015)	Time (March 2016)	Place or Platform
SP5	**E52.3**	Experimentation and modification of the competence framework	Oct 2015–Jun 2016	**2015-11-25 (Vienna)** **2015-12-08 (Berlin)** **2015-01-14 (Neuhausen)** **2016-02-29 to 2016-03-01 (Stuttgart)**	(Hosted) THW, MSB (non-hosted) ARC

SP5	**E52.4**	Web-based competence check for crisis management professionals	Jun 2016–Apr 2017	M28–M32 August–December 2016	Non-hosted – online available in different countries
SP5	**E53.3**	Tests of chosen methods/tools for the collection of lessons/observations (NB: conducted in collaboration with EXPE43)	Aug–Sep 2016	**2016-04-25 to 2016-04-29**	ITTI
SP5	**E53.4**	Tests of chosen methods/tools for validating, adapting and generalising lessons	Aug–Sep 2016	M30 October 2016	Lisbon, Portugal (non-hosted)
SP5	**E54.2**	Testing decision-making process training	Feb–Dec 2016	**2015-06-15 to 2016-06-18** **2015-12-16 to -2015-12-18**	Morton in Marsh (UK), Madrid (Spain)
SP5	**E54.3**	Testing the decision-making context training	Aug–Nov 2015	**2016-04-05 to 2016-04-08**	ITTI (The Hague)
SP5	**E54.4**	Testing the decision-making context training	Apr 2016–Feb 2017	M25–M27 May–July 2016	The Hague
SP5	**E55.2**	Test of response phase	Jun 2016–Apr 2017	**2016-05-11/12**	Stockholm (Sweden)
SP5	**E55.3**	Pilot experiment of recovery phase	Not in plan	**2016-05-18/19**	MSB, Revinge
SP5	**E55.4**	Task experiment of recovery phase	Jun 2016–Apr 2017	M26–M35; June 2016–March 2017	City of the Hague (TBC)

Table 3: SE2 plans for SP5 Training and Learning, time of suspension (boldface: completed)

Comments on scheduling/implementation:

- At the time of suspension, with some mergers and split-ups of the original roster of experiments and some items redefined to be part of the JE campaigns, the number of SE2 experiments is 32 – 15 in SP3, 7 in SP4 and 10 in SP5. While there has been some delay on average in execution, the vast majority of the experiments due to be ready by spring 2016 had also reached completion by then.
- 15 experiments involved hosting, the same number as at MS1 according to Section 4.2. However, in four cases with some parts hosted and other non-hosted.
- It is noteworthy that two pairs of experiment have been twinned in a way not foreseen in the original plans: EXPE36.2 and EXPE 42, and EXPE 43 and E53.3.
- The substantive results of the performed SE2 experiments are discussed in the MS2 report, D6.1.

Annex 3: DRIVER terminology[10]

Introduction

This document presents the current draft DRIVER terminology. It intends to be a terminology for crisis management and resilience building R&D across the many different disciplines required at system-of-systems level research and as represented in the DRIVER project. Thus, it should be noted that generic concepts are (at least sometimes) defined in a DRIVER/system-of-system level research specific context: e.g., civil society and community building have a much broader usage than in this context. It consequently focusses on research terminology, but also includes terms from operational crisis management; in this case consistency with ISO22300 [4] or UNISDR terminology [3], respectively, has been assured. The terminology has been defined at project-level and thus, does not aim at being comprehensive with regard to all terms being used at lower, i.e., SP or WP level of the DRIVER project. It rather aims at gathering terms and definitions that are used in different parts of the project and might be interpreted differently by different scientific disciplines.

All DRIVER partners contributed to the terminology by providing terms with potential for confusion or misunderstandings. In order to enable consistent use across all DRIVER activities, authors are tasked to cross-check with the terminology when drafting deliverables. Also deliverable reviewers are tasked to double-check consistency of deliverables with the current version of the terminology, where necessary and reasonable. It is imperative to have consistency in terminology throughout the different project domains; consistency, however, must be aligned with the content.

To ensure the enforcement of the terminology and as definitions of terms might change over time as new knowledge and understandings accumulate, it will be checked for any updates required and released to the consortium on an annual basis as part of the *DRIVER Project Handbook* (D11.1), being a living document. It is foreseen to coordinate with other projects on terminology. A final version of the terminology will be presented at the end of the DRIVER project.

[10] Note that this terminology was developed to enable harmonisation of terms among DRIVER consortium partners. It is in all cases well possible that different definitions exist.

DRIVER terminology, version 2[11]

DRIVER Crisis management research terminology	Definition	Comment
Affiliated volunteer	These volunteers are attached to a recognised voluntary agency that have trained them for disaster response and has a mechanism in place to address their use in an emergency [5].[12]	These volunteers of first responders are part of the dedicated response and addressed by SP4 and partly also by SP5.
Assessment	The process of estimating the quality of an explored object, i.e., crisis management solution, based on the outcome of experimentation activities and other sources (e.g., operational experience). In an experimentation context the assessment process interprets the results of the experiments in a wide operational context, focusing on potential effects and impacts. Compared to evaluation, which results in knowledge about the outcome of a particular experiment, assessment synthesises the evaluation results in a wider context with the purpose of drawing more general conclusions, considering a broad set of aspects, typically aiming at informing decisions.	
Beneficiary	An entity that benefits from crisis management solutions.	This term is intended to replace the term "end-user" for better differentiation within crisis management and resilience building R&D projects. See also definition of "end-user", "investor" and "operator".

[11] Update of version 1 for the resubmission of D13.2 First Milestone Report.
[12] Developing and Managing Volunteers – Independent Study (2006). Retrieved November 24, 2014, from www.training.fema.gov/emiweb/downloads/IS244.doc

DRIVER Crisis management research terminology	Definition	Comment
		Example: a solution for "high level decision making" is operated by a trainer of a given entity. But the decision maker being trained is the beneficiary.
Best Practice	This encompasses the preferred actions in a specific type of situation to efficiently and effectively achieve a certain objective. Best Practice may be formalised in internal policy documents such as handbooks and standard operation procedures and could be based on one or several Lesson Identified/Lessons learnt approved by decision-makers.[13]	
Civil society	Part of the population that is linked by common interests, but not part of the professional response and not professionally trained in crisis management.	Defined in the DRIVER/system-of-system level research context. Main focus of SP3.
Communication between first responders	The process of communication[14], information sharing and diffusion between professional responders.	Located in SP4. See also "crisis communication"
Competence	Competence is described as covering combinations of skills and knowledge.	
Competence framework	A set of components that provide the foundations and conceptual arrangements for designing, implementing, monitoring, reviewing and continually improving competence management activities in a	

[13] Adapted from i.a. Nato (2011) THE NATO LESSONS LEARNED HANDBOOK, JALLC [7] and European Union Military Committee (2012) EU Military Lessons Learned (LL) Concept, Brussels [8].
[14] As opposed to communication with the general public.

DRIVER Crisis management research terminology	Definition	Comment
	systematic way.	
Competence Management	Competence management means to relate competences to activities in certain tasks and situations and to differentiate by competence levels as well as to enable measurements on target and actual performance and according means for development whereas the organization context has to be reflected.[15]	
Community building	Enabling the different networks of European crisis management - including its stakeholders from regional to EU level - to carry out a structured debate that support requirements driven capability development.	This requires: Sustainable structures to inform, enable and engage regional first responder networks, Better connected existing networks at different levels Fostering of a better understanding of requirements formulation and research & procurement activities needed to transfer these requirements into actual crisis management capabilities across all stakeholders.
Community dimension	The main goal of DRIVER's Community dimension is to engage and connect to stakeholder networks, and to foster a more shared understanding of crisis management.	See also "Community building".

[15] Stracke, C. (2009): DIN PAS 1093. Human Resource Development with special consideration of Learning, Education and Training – Competence Modelling in Human Resource Development, Beuth Verlag, Berlin, p. 6. [9]

DRIVER Crisis management research terminology	Definition	Comment
Content Management System (CMS)	CMS is an application (more likely web-based), that provides capabilities for multiple users with different permission levels to manage (all or a section of) content, data or information of a website project, or internet/ intranet application. Managing content refers to creating, editing, archiving, publishing; collaborating on, reporting, distributing website content, data and information.[16]	
Crisis	Situation with high level of uncertainty that disrupts the core activities and/or credibility of an organisation and requires urgent action.[17] A crisis entails undesirable circumstances that perceived being characterised by substantial uncertainty, time pressure and threat to core values (variable, but for example health, safety, and in more severe circumstances death, etc.). A crisis can come out of any type of emergency and disaster and affords a substantial amount of discourse between crisis managers and community members as well as stakeholders.[18]	See also “disaster” and "emergency”
Crisis communication	The process of communicating information regarding crisis and disasters, to various target groups.	See also “Communication between first responders”
Crisis management	Overall approach preventing crises that might occur, and managing	See also “Emergency management”

[16] Kohan, B. (2010) What is a Content Management System? Retrieved on March 2014 from http://www.comentum.com/what-is-cms-content-management-system.html [10]
[17] ISO 22300.
[18] E.g. Hermann, C. F. (1963). Some consequences of crisis which limit the viability of organisations. Administrative science quarterly: ASQ; dedicated to advancing the understanding of administration through empirical investigation and theoretical analysis, 8(1), 61–82. [11]

DRIVER Crisis management research terminology	Definition	Comment
	challenges arising from a crisis. Often used in parallel with emergency or disaster management.	
Crisis management culture	A shared understanding of many or all aspects of the crisis management process among members of a defined group.	
Crisis management function	Function that aims at achieving effects, e.g., coordination, direction of effort, shared awareness etc. in a crisis management system-of-systems	The term 'function' focuses on what is to be achieved, not how or by whom. Several systems, tools, building blocks etc. may individually or in concert deliver a given function and conversely they may support several different functions.
Crisis management professionals	Crisis management professionals are considered people that received specialised educational training with the goal to deal with a major event that threatens to harm the general public.	
Crisis management professional volunteers	Crisis management professional volunteers are licensed or have a specialised skill. Professional volunteers include medical service providers such as physicians, nurses, emergency medical technicians, mental health professionals, lawyers, building contractors and inspectors, computer technicians, clergy, accountants, etc. These people may volunteer individually or as a group at a crisis scene.[19]	

[19] Developing and Managing Volunteers – Independent Study (2006). Retrieved November 24, 2014, from www.training.fema.gov/emiweb/downloads/IS244.doc

DRIVER Crisis management research terminology	Definition	Comment
Crisis management system-of-systems[20]	A large system built up by several interdependent smaller systems. They can be federated (loosely coupled) or highly integrated.	The contrasting concept is a highly integrated system.
Data, personal	Personal data can refer to practically all forms of information that a researcher might hold. Personal data is information relating to a living individual who can be identified (a) from those data; or (b) from those data and any other information which is in the possession of, or likely to come into the possession of, anyone who may have access to it.	
Data, sensitive	Sensitive personal data is data consisting of the following information: race or ethnic origin; political opinions; religious or other beliefs; trade union membership; health; sexuality; or alleged or actual criminality[21].	
Data Protection Approval	Procedure of applying to the national or local Data Protection Authority to report about the collection, storage and/or analysis of personal data for a specific task. Whether reporting the activity is enough or actual approval is granted depends on the respective data protection authority. The task leader is generally the legal owner of this procedure.	
Demonstration	The action or process of showing the existence or truth of something by giving proof or evidence.	A demonstration can also be an experiment, while an experiment not necessarily is a

[20] As defined by ACRIMAS www.acrimas.eu.
[21] University of Oxford (2012) "Data Protection and Research" Legal Services Briefing Note, p.4 [12]

DRIVER Crisis management research terminology	Definition	Comment
		demonstration.
Disaster	Situation where widespread human, material, economic or environmental losses have occurred which exceeded the ability of the affected organisation, community or society to respond and recover using its own resources.[22] Also, a disaster is a "serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources".[23]	See also "crisis" & "emergency"
Disaster risk reduction	The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.[24]	
DRIVER gaps	Operational crisis management gaps, based on other crisis management projects, that have been validated or updated by the DRIVER project.	

[22] ISO 22300
[23] UNISDR. (2009). UNISDR Terminology on disaster risk reduction. Retrieved from http://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf
[24] UNISDR. (2009). UNISDR Terminology on disaster risk reduction. Retrieved from http://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf

DRIVER Crisis management research terminology	Definition	Comment
Emergency	A crisis or emergency is a threatening condition that requires urgent action. Effective emergency action can avoid the escalation of an event into a disaster.[25]	See also "Crisis" and "Disaster".
Emergency management[26]	The organization and management of resources and responsibilities for addressing all aspects of emergencies, in particular preparedness, response and initial recovery steps.	Emergency management involves plans and institutional arrangements to engage and guide the efforts of government, non-government, voluntary and private agencies in comprehensive and coordinated ways to respond to the entire spectrum of emergency needs. The expression "disaster management" is sometimes used instead of emergency management.
Emergency management, The Four Phases of[27]	• Prevention[28] – Preventing future emergencies or minimizing their effects. This includes all activities that prevent an emergency, reduce the chance of an emergency happening, or reduce the damaging effects of unavoidable. • Preparedness – Preparing to handle an emergency includes plans	See also the UNISDR definitions of the phases under "Mitigation", "Prevention", "Preparedness", "Response" & "Recovery".

[25] UNISDR. (2009). UNISDR Terminology on disaster risk reduction. Retrieved from http://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf
[26] Definition and comment: UNISDR. (2009). UNISDR Terminology on disaster risk reduction. Retrieved from http://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf
[27] Definition by Laakso, K., & Palomäki, J. (2013). The importance of a common understanding in emergency management. Technological Forecasting and Social Change, 80(9), 1703–1713. doi:10.1016/j.techfore.2012.12.012. The four phases can also be attributed to crisis or disaster management. [13]
[28] Follows the definition by Laakso, K., & Palomäki, J. (2013). For the interchangeably use of the terms "Mitigation" and "Prevention" see the definitions by UNISDR.

DRIVER Crisis management research terminology	Definition	Comment
	made to save lives and to help response and rescue operations. Evacuation plans and stocking food and water are both examples of preparedness. • Response – Responding to an emergency includes actions taken to save lives and prevent further damage in an emergency. Response is putting the preparedness plans into action. • Recovery – Recovering after an emergency includes actions taken to return to a normal or an even safer situation following an emergency. Recovery includes getting financial assistance to help pay for the repairs.[29]	
End-users	Previously used for describing the "users" of the solutions/results developed in crisis management and resilience building R&D projects. For a better differentiation this term is replaced by investors/operators/beneficiaries. See comment.	Groups of people that can include: • Investors • Operators • Beneficiaries of crisis management solutions. Refer to the corresponding definitions in this document.
EU crisis management innovation eco-system	The EU system of research & procurement mechanisms including procedures for stakeholder exchange that is supposed to foster requirement-matching crisis management capabilities and a competitive industry.	DRIVER seeks to improve different components of this Innovation Eco-System by developing its three dimensions. See also "Methodology & infrastructure dimension",

[29] Laakso, K., & Palomäki, J. (2013). The importance of a common understanding in emergency management. Technological Forecasting and Social Change, 80(9), 1703–1713. doi:10.1016/j.techfore.2012.12.012

DRIVER Crisis management research terminology	Definition	Comment
		"Solution dimension" & "Community dimension".
EU crisis management system-of-systems	The highly diversified assembly of EU-level crisis management integrating organisations and components with different cultures, policies and assets, and various stakeholders and procurement schemes.	See also "Crisis management system-of-systems".
European network of crisis management laboratories (ENCML)	Vision of a future network of laboratories with capabilities for experimentation in order to *improve training* and support distributed experiments of crisis management technologies relevant to emergency response centres. Related to Test-bed sustainability.	Objective of WP27.
Evaluation	1) (in common usage) The process of determining the performance and/or impacts of a candidate application, usually in comparison to a reference case (existing situation or alternative applications), and usually including an experimental process based on real-life or other trials, often involving users.[30] In the DRIVER context, it means a limited analysis on an emerging solution from the outcome of a single experimentation activity (related to assessment)".	

[30] Oxford Dictionaries

DRIVER Crisis management research terminology	Definition	Comment
	2) (within the field of training and learning, in SP5) To decide whether training/learning objectives were achieved (learning issues), and whether accomplishment of those objectives result in enhanced performance on the job (transfer issues).[31]	
Exercise	An activity carried out for a specific purpose or a task set to practice or to test a skill.[32]	
Experiment	A scientific procedure undertaken to 1) make a discovery, 2) test a hypothesis, or 3) demonstrate a known fact. Experimentation in DRIVER involves the testing of novel "solutions" (a mix of existing and new technological, conceptual or organizational solutions) under controlled conditions, to assess their effectiveness and possible impact. The term experiment is used for all types of experimentation activities in DRIVER.	A demonstration can also be an experiment, while an experiment not necessarily is a demonstration. A detailed scientific background and definition can be found in D23.1x
Experiment design	The process of planning an experiment. It includes the definition of hypothesis and/or research questions; the selection of an appropriate experimental type, set-up, and methodology; selection of expertise and people needed; and the selection of a platform or combination of platforms (and the interplay needed).	See Annex 3 for a full description of the experiment design process
Experiment host	See "Platform owner"	

[31] Kraiger, K., Ford, J. K., & Salas, E. (1993). Application of cognitive, skill-based, and affective theories of learning outcomes to new methods of training evaluation. Journal of Applied Psychology, 78(2), 311–328. [14]
[32] Oxford Dictionaries Web (2014). Retrieved at 23 December 2014 from http://www.oxforddictionaries.com/definition/english/exercise

DRIVER Crisis management research terminology	Definition	Comment
Experiment leader	The person responsible for a particular experiment (including final demo).	The experiment leader is in charge for • Planning the experiment supported by SP2 in design; • Preparing the experiment • Installs, integrates and tests new systems; • Training participating personnel; • Performing the experiment including data collection; • Performing the evaluation supported by SP2; • Dismantling the experiment setup. The experiment owner is not necessarily the SP or WP leader.
Experimentation activity	See Experiment	
Experimentation campaign	A set of experiments orchestrated around a specific set of issues (Albert and Hayes 2002 [6])[33]. Experimentation campaigns are created to provide as many multifaceted insights as possible into a number of related issues or innovations	Good campaigns are: • Orchestrated: Careful timing and matching of solutions-experiments-scenarios-platforms • Adaptive: Subsequent steps

[33] Alberts, D. S., Hayes, D., S., (2002), *Code of Best Practice Experimentation,* CCRP Publication Series

DRIVER Crisis management research terminology	Definition	Comment
		determined based on earlier results.
High-level decision-makers	See Strategic decision-makers.	
In silico experimentation	Experiments conducted in a modelling and simulation (cyber) environment.	See *Physical experimentation*
Innovation	Implementation of a novel solution into the operational Crisis management process.	Different from invention of a novel solution; very few inventions become innovations!
Investor	An entity that invests into crisis management solutions, e.g., through procurement.	This term is intended to replace the term "end-user" for better differentiation within crisis management and resilience building R&D projects. See also definition of "end-user", "beneficiary" and "operator".
Joint experiment (JE)	Integrated experiments at DRIVER combining solutions from the following dimensions: civil society resilience, strengthened responders and training and learning (SP3, SP4, SP5).	
Large-scale crisis management	Overall cross-border approach to preventing and managing crises	
Legacy systems	(Crisis management) system currently in operational use.	
Lesson Identified	One or several Observation(s) that has/have been analysed and validated, i.e., the character, scope and importance of the observation has been determined together with suggestions for future actions	

DRIVER Crisis management research terminology	Definition	Comment
	regarding doctrine, organisation, training, materiel, leadership, personnel and/or facilities.[34]	
Lesson Learned	A Lessons Identified that has been endorsed by appropriate people and implemented with verifiable results.[35]	
Maturity assessment of solutions	Analysis of time and resources needed, as well as the suitable policy instruments (e.g., PCPs or PPIs), for reaching a solution possible to insert into operational use ('fieldable solution').	
Measurement	Consists of assigning numbers or labels to the units of analysis that accurately represent their position on the variables under study.[36]	
Measurement instrument	A mechanism utilised to directly or indirectly measure, indicate, and/or monitor the value of an observed and/or controlled quantity. Such an instrument may also record these variations.[37]	
Methodology & infrastructure dimension	Development of an infrastructure for CM capability development – the DRIVER Test-bed.	Achieved in constant interaction with the supported experimentation activities.
Mitigation	The lessening or limitation of the adverse impacts of hazards and	See also "Prevention" and "Emergency

[34] Adapted from i.a. Nato (2011) THE NATO LESSONS LEARNED HANDBOOK, JALLC and European Union Military Committee (2012) EU Military Lessons Learned (LL) Concept, Brussels.
[35] Adapted from i.a. Nato (2011) THE NATO LESSONS LEARNED HANDBOOK, JALLC and European Union Military Committee (2012) EU Military Lessons Learned (LL) Concept, Brussels.
[36] Katrina A. Korb (2012) Conducting Educational Research - Steps in Conducting a Research Study. Retrieved at 23 December 2014 from http://korbedpsych.com/R09DevelopInstruments.html [15]
[37] Dictionary Of Engineering (2014) Retrieved at 23 December 2014 from http://www.dictionaryofengineering.com/definition/measurement-instrument.html [16]

DRIVER Crisis management research terminology	Definition	Comment
	related disasters.[38] Measures taken to prevent, limit and reduce impact of the negative consequences of incidents, emergencies and disasters[39] Actions taken by a government, society or individuals before a disaster to decrease vulnerability, primarily through measures that reduce causalities and exposure to damage and disruption or that provide passive protection during disaster impact.	management, The Four Phases of".
Observation	An observed effect of an action (or inaction) in a specific situation. The observation could be both positive (a successful action) or negative (the action fails to achieve the intended objective). A preliminary observation may need to be developed further, e.g., through the collection of more information on the context.[40]	
Open call	Mechanism to include further partners to bring in expertise or Intellectual Property that is missing in the project.	
Operator	Individual that performs a role, task or function in the crisis management system	This term is intended to replace the term "end-user" for better differentiation within crisis management and resilience building R&D projects. See also definition of

[38] UNISDR. (2009). UNISDR Terminology on disaster risk reduction. Retrieved from http://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf
[39] ISO 22300
[40] Adapted from i.a. Nato (2011) THE NATO LESSONS LEARNED HANDBOOK, JALLC and European Union Military Committee (2012) EU Military Lessons Learned (LL) Concept, Brussels.

DRIVER Crisis management research terminology	Definition	Comment
		"beneficiary" and "investor".
Organisation	Person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its objectives.[41]	
Physical experimentation	Experiments conducted in real life as opposed to *in silico*, either in a dedicated experiment platform or a real operational context (e.g., a metro station or a city).	
Platform	An operational or training facility or one dedicated to experimentation. Can be distributed across several sites. Often a mixture of physical and cyber, including fully model-based facilities (cf. *in silico* experimentation).	Platforms in DRIVER that are also used to host the DRIVER experiments are • France: SDIS13 exercise ground, EPLFM CESIR Simulation centre, CENALT Tsunami warning centre • Germany: THW exercise grounds • Italy: JRC test crisis room • The Netherlands: City of the Hague exercise ground as crisis room • Poland: several sites and crisis rooms • Sweden: MSB sites, in particular MSB College Revinge See also "DRIVER Test-bed".
Platform owner	A partner with control over a platform provided to the project.	The platform owner

[41] ISO 22300

DRIVER Crisis management research terminology	Definition	Comment
		• Provides facilities and basic support services to experiment(s) • Can aid experiment owner in recruiting personnel and experts to participate in the experiment • Prepares the site to receive the experiment setup • Provides logistic support to the experiment which can include recruiting local actors/players See also terms related to "Experiment"
Portfolio of emerging solutions (PoES)	In general an ensemble of solutions selected according to some specified criteria. The DRIVER PoES: An ensemble of (emerging) solutions that implement the most valuable additional crisis management functions not requiring extensive research – but typically innovation activities like Pre-Commercial Procurement – as identified by the totality of DRIVER activities. The solutions will be accompanied by information on maturity level, requirements and suitable instruments for reaching fieldable products, as well as recommendations regarding context factors (e.g., legislation, policy or societal impact).	The main deliverable of the "Solutions dimension". Formerly referred to as Portfolio of tools (PoT).
Preparedness	The knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to	See also "Emergency management, The Four Phases of".

DRIVER Crisis management research terminology	Definition	Comment
	effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions. [42]	
Prevention	The outright avoidance of adverse impacts of hazards and related disasters.[43]	Prevention (i.e., disaster prevention) expresses the concept and intention to completely avoid potential adverse impacts through action taken in advance.Very often the complete avoidance of losses is not feasible and the task transforms to that of mitigation. Partly for this reason, the terms prevention and mitigation are sometimes used interchangeably in casual use.[44] See also "Mitigation" and "Emergency management, The Four Phases of".
Public	When a disaster strikes *the public* consists of the affected population, but also of persons who carry out significant relief efforts, both independently (helping themselves, relatives, neighbours and friends) and in support of relief agencies (as volunteers and upon request). Furthermore, the public plays a major role in crisis preparedness, for example as a source of funding and personnel, and – even more	

[42] UNISDR. (2009). UNISDR Terminology on disaster risk reduction. Retrieved from http://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf
[43] UNISDR. (2009). UNISDR Terminology on disaster risk reduction. Retrieved from http://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf
[44] UNISDR. (2009). UNISDR Terminology on disaster risk reduction. Retrieved from http://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf

DRIVER Crisis management research terminology	Definition	Comment
	important – the public determines the legitimacy of official relief agencies.[45]	
Recovery	The restoration, and improvement where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors.[43]	See also "Emergency management, The Four Phases of".
Research ethics	The application of moral rules and professional codes of conduct to the collection, analysis, reporting, and publication of information about research subjects, in particular active acceptance of subjects' right to privacy, confidentiality, and informed consent.[46] The main concern of research ethics is not only to conform to given legal and moral codes, but to enhance the legitimacy and scientific quality of the project.	In DRIVER overlooked by SP1[47].
Resilience	The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.[48] The ability of individuals, communities, organisations, or countries	DRIVER SP3 refers to the IFRC definition

[45] Stolk, D.J., Beerens, R., Groeve, T. de, Benoit Hap, B., Kudrlova, M., Kyriazanos, D., Miki Langinvainio, M, Lee, M.D.E. van der, Missoweit, M., Pastuszka, H.M., Pieneman, R.B.J., Rijk, R. van, Segou, O., & Vollmer, M. (2012). Aftermath Crisis Management – ACRIMAS – Phase I: D5.1 Approaches and Solutions. FP7-261669 ACRIMAS Aftermath Crisis Management. Brussel, Belgium. [17]

[46] Gordon Marshall 1998: A Dictionary of Sociology. [18]

[47] After the restructuring process. This task was previously located in ex-SP9.

[48] UNISDR. (2009). UNISDR Terminology on disaster risk reduction. Retrieved from http://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf

DRIVER Crisis management research terminology	Definition	Comment
	exposed to disasters […] to: a) anticipate b) reduce the impact of, c) cope with d) and recover from the effects of adversity without compromising their long-term prospects.[49]	
Response	The provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected[50]	See also "Emergency management, The Four Phases of".
Scenario	Pre-planned storyline that drives an exercise, experiment or demonstration; the stimuli used to achieve decided exercise objectives.[51]	
Set of solutions	See "Portfolio of emerging solutions".	
Skill	Ability to apply knowledge and use know-how to complete tasks and solve problems.[52]	
Societal impact	Dimension of crisis management that refers to its unintended positive	Main focus of WP84[53].

[49] International Federation of Red Cross and Red Crescent Societies IFRC (2012) The road to resilience - IFRC discussion paper on resilience http://www.ifrc.org/PageFiles/96178/1224500-Road%20to%20resilience-EN-LowRes%20%282%29.pdf
[50] UNISDR. (2009). UNISDR Terminology on disaster risk reduction. Retrieved from http://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf
[51] Adapted from ISO 22300
[52] Cedefop: Terminology of European education and training policy. A selection of 130 key terms. Second edition, Luxembourg: Publications office of the European union, 2014, p. 227 [19]
[53] After the restructuring process. Societal impact was previously located in ex-SP9.

DRIVER Crisis management research terminology	Definition	Comment
	or negative impacts on different societal groups or society as a whole, as well as on its core values and societal principles as captured for example in fundamental rights, constitutional laws, but also in public debate.	
Societal Impact Assessment (SIA)	The process of analysing potential unintended positive or negative impacts on different societal groups or society as a whole,, as well as on its core values and societal principles as captured for example in fundamental rights, constitutional laws, but also in public debate. This analysis utilizes a specifically developed SIA framework.	T84.2
Societal resilience	The ability of human communities to withstand and recover from stresses, such as environmental change or social, economic or political upheaval. Resilience in societies and their life-supporting ecosystems is crucial in maintaining options for future human development.[54]	
Solution	A building block that contributes to a crisis management function.	Solutions can be technologies, tools, methods, concepts, or recommendations that regard potential technical, organisational, procedural, legal, policy, societal, or ethical improvements to the European crisis management legacy. Replaced the previously used term “tool” in

[54] Stockholm Resilience Centre: Resilience Dictionary, http://www.stockholmresilience.org/21/research/what-is-resilience/resilience-dictionary.html

DRIVER Crisis management research terminology	Definition	Comment
		DRIVER to avoid an interpretation limited to technology/software related solutions. See also “DRIVER set of solutions”, “Portfolio of emerging solutions” & “Solutions dimension”
Solutions dimension	Development of the DRIVER PoES as well as an updated crisis management functional architecture and an assessment of maturity as regards potential building blocks.[55]	Formerly referred to as thematic dimension. See also “Portfolio of emerging solutions”.
Spontaneous volunteer	These are people who volunteer in the immediate aftermath of a disaster or an emergency. They may be skilled or unskilled and may be from the affected area or from outside the area. Channelling spontaneous volunteers – especially if they present in large numbers as they did in New York City following September 11 or during the great flood in 2013 in Germany and other countries – presents special management challenges.[56]	More detailed definitions in D36.1.
Strategic decision	A decision that has a societal cross – cutting impact, with wide impact on large parts of the society and its activities, deals with important values, sometimes when the values compete one with the other.	Defined by SP5

[55] See also D13.2 and *Meeting the challenge: the European Security Research Agenda.* A report from the European Security Research Advisory Board (ESRAB), Luxembourg: Office for Official Publications of the European Communities, September 2006 (http://ec.europa.eu/enterprise/policies/security/files/esrab_report_en.pdf accessed 11 February 2015).

[56] Developing and Managing Volunteers – Independent Study (2006). Retrieved November 24, 2014, from www.training.fema.gov/emiweb/downloads/IS244.doc

DRIVER Crisis management research terminology	Definition	Comment
	Decisions that have important impact on the society, some of them are adverse, and that deal with a time frame of many hours to weeks (usually when it comes to the impact of the decision).[57]	
Strategic decision maker	The individual who has the power and is tasked to take a strategic decision. These are elected officials, and high ranking personnel in response organizations / relevant authorities / agencies tasked with the response to the crisis.	Sometimes also mentioned as "High-level decision maker".
Sub-project experiments (SE)	Series of experiments conducted at SP-level.	
Table top exercises	The table top exercise is a meeting to discuss a simulated emergency situation. Table top exercises are low cost and can sometimes be easily and frequently organised. It cannot recreate the real atmosphere, (e.g., stress, confusion) and needs to keep critical decisions in very little time.[58]	Based on the definition of the Police university of Wisconsin where table top exercises are defined as "an activity in which key personnel assigned emergency management roles and responsibilities are gathered to discuss, in a non-threatening environment, various simulated emergency situations." [59]
Technology Readiness Level	Technology readiness levels (TRLs) are measures used to assess the maturity of evolving technologies (devices, materials, components, software, work processes, etc.) during their development and in some	

[57] Kathleen M Eisenhardt; Mark J. Zbaracki , Strategic Management Journal, vol 13, special issue; Fundamental Themes is Strategy Process Research (Winter, 1992), 17-37 - Contacted a review of existing literature on strategic decision making. [20]
[58] Definition of table top exercise. Retrieved 30 October 2014 from http://uwpd.wisc.edu/content/uploads/2014/01/What_is_a_tabletop_exercise.pdf
[59] Definition of table top exercise. Retrieved 30 October 2014 from http://uwpd.wisc.edu/content/uploads/2014/01/What_is_a_tabletop_exercise.pdf

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<tr><th>DRIVER Crisis management research terminology</th><th>Definition</th><th>Comment</th></tr>
<tr><td></td><td>cases during early operations.
Generally speaking, when a new technology is first invented or conceptualised, it is not suitable for immediate application. Instead, new technologies are usually subjected to experimentation, refinement, and increasingly realistic testing. Once the technology is sufficiently proven, it can be incorporated into a system/subsystem.
<table>
<tr><th>TRL</th><th>Description</th></tr>
<tr><td>TRL 1.</td><td>basic principles observed</td></tr>
<tr><td>TRL 2.</td><td>technology concept formulated</td></tr>
<tr><td>TRL 3.</td><td>experimental proof of concept</td></tr>
<tr><td>TRL 4.</td><td>technology validated in lab</td></tr>
<tr><td>TRL 5.</td><td>technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)</td></tr>
<tr><td>TRL 6.</td><td>technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)</td></tr>
<tr><td>TRL 7.</td><td>system prototype demonstration in operational environment</td></tr>
</table></td><td></td></tr>
</table>

DRIVER Crisis management research terminology	Definition	Comment
	TRL 8. system complete and qualified **TRL 9.** actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space) **Figure 15. Technology Readiness Level according to annex G of the H2020 Work Programme**	
Test-bed	An assembly of virtually connected, distributed operational or training facilities or ones dedicated to experimentation (cf. platform) plus tools (modelling and simulation, data recording, data analysis), methods (experiment design, campaign planning, analysis, evaluation), and knowledge from past crises and experiments .	The main deliverable of the Methodology & Infrastructure dimension. The « DRIVER » Test-bed does not include personnel.
Training	Activities designed to facilitate the learning and development of knowledge, skills, and abilities, and to improve the performance of specific tasks or roles.[60]	
Volunteer	A person who willingly provides, at all stages of a crisis, services, without concern for financial gain which are for the benefit of others.	
Volunteering	Volunteering is generally considered an altruistic activity and is intended to promote goodness or improve human quality of life. In return, this activity can produce a feeling of self-worth and respect. There is no financial gain involved for the individual. Volunteering is	

[60] ISO 22301:2012 – Societal Security – Terminology 2.3.7

DRIVER Crisis management research terminology	Definition	Comment
	also renowned for skill development, socialization, and fun. Volunteering may have positive benefits for the volunteer as well as for the person or community served. It is also intended to make contacts for possible employment. It is helping, assisting, or serving another person or persons without pay. Many volunteers are specifically trained in the areas they work, such as medicine, education, or emergency rescue. Others serve on an as-needed basis, such as in response to a natural disaster.[61]	

[61] Volunteering (n.d.). Retrieved November 24, 2014, from http://en.wikipedia.org/wiki/Volunteering

Annex 4: Experimental methodology: a six-step approach

This appendix aims to provide practical guidance to prepare and run experiments and deals with a series of fundamental issues that must be taken into account when designing experiments. A systematization with concrete DRIVER examples will be provided in future iterations on the basis of Lessons learnt from experiments. Furthermore, at this stage, practical guidance deals more with organizational issues than with a common methodological framework which can be applied across SPs. The six-step approach outlined below is a basic structure helpful to design and conduct experiments in the context of the project.

DRIVER proposes a six-step approach to carry out experiments. All steps are critical and must be performed for an experiment. Depending on the type of experiment, the goals and the complexity, each step will be a small task or a large process consisting of many sub tasks (in the latter case we refer to a campaign of experiments). The steps should not be interpreted as a waterfall approach. Iterations may occur between activities to update information as needed.

It should be considered that, for the sake of clarity and of simplicity, the examples in the following pages concern mainly experiments which revolve around and/or involve technology (e.g., experiments carried out in SP4).

Figure 16: Experimental methodology

1. Formulate hypothesis, research questions and methods

Purpose: The purpose of this step is to provide a clear formulation of the experiment, including a description of the problem to be addressed, the objectives to be reached and the propositions/hypotheses to be tested.

Activities:

- Formulate hypothesis and research questions
- Identify methods
- Develop conceptual model (if first experiment in campaign)
- Create initial experimentation plan (e.g., experiment design and scenario design)

Additional activities:

- Selection of the DRIVER platform(s) to host the experiment ought to take place right in the first step[62]. The selected platform will dictate security constraints, schedule, availability of platform personnel, etc., for the rest of the process.
- Activity missing to create the initial plan in order to capture the results of the activities, and also capture management information such as schedule, milestones, key personnel, etc. Additional plans may be needed, or can be rolled up in a single plan such as security plan, logistics plan, etc.

Before starting anything else, hypothesis and research questions must be identified. It is worth noting, that the formulation of hypothesis and research questions depends on the methodology used. While in quantitative research these two elements are closely interconnected, in qualitative studies research questions come first. Furthermore, in order to develop propositions, it is crucial to take into account the tradition of work that already exists on a subject [22]. For instance, it is worth exploring:

- Literature;
- Reports or other relevant documents on experiments of similar nature,
- Findings of previous research projects which have identified gaps (e.g., ACRIMAS) and/or the need to explore specific areas

If results of previous experiments are used, it must be clearly explained which results are taken into account, why and which not.

Experiments are not stand-alone activities. They are typically preceded by an idea that is worked out in the Concept Development phase of the experimentation campaign cycle. A "conceptual model" should be defined for the experimentation campaign. This must be done in an Experiment Conceptualization step. The conceptual model is a mechanism for the communication of the problem space among stakeholders in the experiment. It is a (conceptual) model of the system of interest that is under experimentation. For example the model shows the CM organization, roles, responsibilities, activities performed, C2 systems used. The model shows where new concepts are introduced that are subjected to an experiment; e.g., an adapted organization to improve efficiency, or new C2 systems to improve situational awareness.

The creation of an initial experimentation plan must include:

1) A clear formulation of hypothesis and/or research questions
2) An overall e methodology must be decided to gather evidence to address hypothesis and questions. As specified in 1.5, methods vary and include quantitative and qualitative strategies of inquires that must be identified from the onset (e.g., structured interviews, focus groups etc.). The methodological criteria governing scientific inquiry, depends on the goals of the experiment.

[62] Cf. DRIVER 25.11 DRIVER Platform Improvement Needs

3) A clear statement of the goals and expected outcomes (what will be experimented, who is the audience.) A list of expected outcomes (break-down of goal in different outcomes in terms of technology, user groups, links with other SPs)
4) Definition of criteria for success of the experiment (protocol for validating or revoking the experimental hypothesis).

Some typical goals may include:

- Test functioning and features of a single technology: Can a task be performed? Does the tool contribute to the function it is supposed to contribute to?
- Test a particular configuration of technologies (interoperability, benchmarking): are technologies working seamlessly with other tools to provide a given function or in conjunction with other functions (and tools therein) at system of systems level?
- Test effectiveness of (configuration of) technology in a given setting (for a particular user group or in a given cooperation scenario): are tasks performed faster and/or better?
- Test functioning and features of a single concept or functionality (part of an existing technical solution): can a task be performed faster and/or better?
- Test effectiveness of an organizational / procedural approach: are tasks performed faster and/or better?
- Networking and awareness / creation of market: are mature technologies of interest to a certain user group that is currently not using them?
- Evaluate cost-benefit of solutions / approaches: are certain technologies / approaches a good investment option for an organization (operational benefit in relation to life-cycle costs)?

Secondly, experiments will be designed differently depending on which level of crisis management is addressed. Experiment objectives must address expected outcomes, and tasks and metrics must be designed appropriately. The initial methodology considers the following levels:

- Technological test device or software (e.g., experiment).
- Operational: improve operations in the field (e.g., observational study).
- Tactical: improve situation awareness, command and control; improve decision making (e.g., quasi-experiment).
- Strategic: guide investments in innovation; improve preparedness, capabilities, etc. (e.g., workshops).
- Systemic: influence Civil Protection system in a MS and in the EU.

A third element to consider is the level of complexity and realism needed in the experiment. As argued in the Introduction, a key component of experimentation is the controlled setting. In order to produce relevant results, the environment may have to be controlled (e.g., fixing variables to provide, for instance, level playing field) or realistic (e.g., allow or encourage random events). Some examples of different levels of complexity include:

- Single device.
- Single technology in controlled environment (e.g., comparison of mobile devices).

- Range of connected technologies in controlled environment (e.g., information exchange between field and HQ).
- Exercise in realistic environment.
- Human-computer interaction in lab (short experiment).
- Human-computer interaction in lab (experiment over days or weeks).
- Human-computer interaction in exercise (many participants).
- Human-computer interaction, combined with technology testing, in large scale exercise.
- Large scale exercise combining all.

Also, at highest complexity level it has to be taken into consideration that crisis management functions, solutions or capabilities have to be experimented in various (cross-border) configurations reflecting the operational reality of EU crisis management cross-border operations[63].

Last but not least goals with respect to the "sustainable impact" dimension should be identified:

These are some of the elements that need to be considered in the first step.

2. Select participants

Purpose: The purpose of this step is to identify the participants in the experiment.

Activities:

- Identify roles that are important in the experiment
- Select participants that assume some role in the experiment
- Sampling[64]
- Select DRIVER platform(s), if not already identified in step 1.

Once the hypothesis, methods and goals are defined, the participants needed to complete the experiment successfully must be selected. While at the early stage it is not necessary to identify individual participants, the various groups must be defined from the beginning. Typically the groups include:

- Technology providers / Process providers: what will be experimented with.
- Scientists: provide input / feedback / learn on R&D issues / methodological support.
- Facilitators: help experimenters to carry out the activities.
- Industry: provide input / feedback / learn on innovation, existing solutions, bringing to market.
- Crisis management practitioners: execute the experiment / evaluate the experiment / be exposed and advocate to DRIVER methodology.

Participants must be selected from three groups:

- DRIVER platform(s): one or more DRIVER platforms will be targeted.
- DRIVER partners: DRIVER partners have priority to participate.

[63] Cf. DRIVER D21.21

[64] Sampling strategies will be discussed in the next iterations.

- External (Academic, Practitioners, and Industry): if expertise is lacking in DRIVER or the experiment is about testing a variety of similar technologies, external partners must be selected.

The inclusion of external participants is of particular importance to gain a perspective which cannot be achieved through "internal gaze" only. In other words, in the context of DRIVER, external participants can be compared – even if to some extent- to "control groups", often used in other scientific domains (such as medicine, sociology etc.). In research design a control group is group looked upon as exhibiting the counterfactual, "that is what the treatment group would have looked like had it not been exposed to the treatment" [22]. While in the project externals do not play the role of "comparison groups" or "placebo groups", they can offer insights which can be useful to check or countercheck the evaluation of the results.

The selection of participants must cover all **roles** that are needed for the experiment:

- **Experiment lead**: makes the final decisions in the preparation and execution of the experiment; coordinates the contributions of the participating partners; assures the readiness for the experiment execution, controls the experiment execution, gives instructions and provides input; data monitors the schedule and the adherence to the script.
- **Facilitators**: organizational support and guidance during the preparation and execution of the experiments; take records of the experiment and collect feedback of the participants.
- **DRIVER platform representative**: the contact point for each participating DRIVER platform.
- **Technical supporters**: prepare the technical conditions and the input data; pre-test the experiment configuration; tackle technical problems prior and during experiment execution; archiving of the tested configuration and the data.
- **Process supporters**: professional experts, supporting the experiments from functional point of view provides input to the scenario script in order to keep it realistic and significant.
- **Coaches**: provide appropriate training on the used tools and processes prior the experiment introduce the experiment performers to the exercise scenario support them in case of ambiguity or confusion
- **Experiment performers**: play their role according to the script bring-in their professional experience give feedback in questionnaires and free statements.
- **Evaluators**: control the alignment of the experiment set-up and execution with the pre-defined goals; observe the experiment from a neutral perspective act as conciliator in case of disagreements summarize the feedback and metrics evaluate the results of the experiment.

Other roles include:

- **Observers and advisors**: learn about the DRIVER in general and the experiment and assessed solutions in particular, thereby raising the dissemination value for DRIVER and the interest for participating stakeholders (e.g., technology suppliers) to be involved (and hence increasing the change of a viable financial model to finance experiments). It should also be decided if there is an opportunity of involving remote observers (through web-conferencing) and how they could be effectively be engaged with.

- **Dissemination Team**: to support dissemination activities it can be desirable to involve dedicated participants dealing mainly with the logistics of the event and the collection of dissemination elements (interviews, photos, videos, interviews).

For each role, the expected outcomes of the experiments must be specified. **Expectation management is critical to keep participants engaged in future experiments.** Realistic and clear outcomes must be defined for each group of participants in advance.

DRIVER platforms must be involved from the start in the design of the experiment. DRIVER platforms are expected to influence the scenarios, objectives and scope, as they have 1. a lot of experience with running exercises and simulations but also 2. boundary conditions and limited availability to contribute to DRIVER (conflicts with other exercises and operations outside of DRIVER).

Typically, the selecting of participants must be done between 12 and 6 months before the experiment.

3. Prepare experiment

Purpose: The purpose of this step is to develop the experiment and prepare for experiment execution. Most important is to plan the experiment execution in detail. In addition, technical aspects must be considered: simulation tools are integrated in a simulation environment, data collection tools are developed, a network infrastructure is developed, live systems are connected to the simulation environment, and tools and systems are configured with an executable scenario. Furthermore, training is provided, and rehearsals and pre-tests are performed.

Experiment preparation takes at least 6 months, but will usually take longer for more complex experiments. Because it is a complex and lengthy process, each experiment will be designed differently, focusing on issues important for the particular goals, expected outcomes and participants.

At least the following steps are mandatory:

- **Calendar of actions, milestones and deliverables**. The calendar must include the period before, during and after the actual experiment. It includes all phases, including scenario building meetings, experiment dates, evaluation period, and report drafting.
    - **Organisational and logistical aspects** are important to consider, including facilities, hotels, catering, etc.
    - **Possible dissemination opportunities**
- **Agenda setting.** The agenda of the experiment is primarily focused on expectation management of the participants. It must include: (1) programme of activities, (2) role of participants, (3) expected outcomes for participant groups, (4) introduction of experiment goal, and (5) follow-up process and expected date of experiment conclusions.
- **Tasks to be completed in experiment**. In light of the goal and expected outcomes, specific tasks must be designed that will produce evidence to prove or disprove them. Sometimes a "Null hypothesis" and associated baseline experiment may be defined (i.e.,, a parallel execution using current practices without DRIVER technology / approaches).

For instance, in this step the simulation environment to support the experiment will be developed and integrated, as needed, based on the DRIVER Test-bed architecture. This involves activities to select simulation tools, allocate modelling responsibilities to tools, integrate tools and connect them to live systems, configure them with terrain databases, etc. It also includes refinement of the functional scenario in configurations for simulation tools, live systems and event generators, and activities to provide training, rehearsals and pre-tests.

In many cases, test data will be generated or distributed during the experiment. This may include simulations (e.g., flood simulations), injects (e.g., event happening or information available at predefined times) or base data (e.g., critical infrastructure locations). It is essential that the simulated environment is well tested before and is not a source of failure.

In some cases material for publications and dissemination will be generated; it must be ensured that this material can be released without creating difficulties for the participating people and organisations, including ethical problems (e.g., violation of privacy), legal problems (e.g., related to copyrights and IPRs) or image problems (creating the wrong public perceptions).

4. Running the experiment

Purpose: The purpose of this step is to conduct the experiment and collect the resulting data for analysis

Activities:

- Brief participants
- Perform experiment
- Perform evaluation

The following steps are required:

- **Introduction**: all operative participants to the experiment must be made aware of the purpose, objectives and steps of the experiment, as well as the expected outcomes and evaluation methods. This should include:
    - A description of the context and the basic setup: What is the scenario about? What will happen in the background? What will/should you see?
    - The evaluation criteria: What should the audience watch specifically (e.g., benefits of different data formats)? What is not within the focus of the experiment (e.g., symbols used) and therefore is not within the foreseen evaluation?
    - The scenario of experiment: What is the code of conduct? Who will guide through the experiment? When is it allowed to ask questions? When is the time for feedback? Shall everybody make notes during the experiment for later discussion?
    - The handling of tools and processes: sufficient user training and introduction to the executed processes has to be performed prior to the experiment execution.
    - The intended publication of results and dissemination activities related to the experimentation
- **Roles and tasks**: all participants (including the audience) must be assigned clear roles and tasks. This may range from specific tasks in the experiment (act as users) to a more generic role (provide feedback at the end).

- **Running of experiment**
- **Evaluation**: it is recommended to prepare a number of evaluation steps, including
    - Hot wash-up: short discussion immediately after the experiment.
    - Cold wash-up: discussion after a few weeks in order to consider carefully all relevant aspects which emerged during the experiment.
    - Moderated discussions: longer, moderated discussions organized along the expected outcomes and following the evaluation criteria.

Moreover, the evaluation should be as structured as possible, namely using specific evaluation sheets in order to collect only important data.

5. Interpret evidence

Purpose: The purpose of this step is to analyse and evaluate the data acquired during the experiment execution, derive conclusions and report the results.

Activities:

- Analyse data
- Derive conclusions
- Report results
- Revisit hypothesis and assumptions

After the experiment, the gathered data must be analysed and interpreted according to a predefined method. This is done for each task, and for the experiment as a whole. Qualitative and quantitative data is interpreted in the light of the goals and outcomes set out at the start.

Three dimensions must be included:

- **Analyse evidence and results for experiment**. Analyses will be executed after the experiment according to evaluation approach. A timeline for the analysis and production of an associated report must be well defined.
- **Analyse effectiveness of experiment set-up**. As DRIVER is working with experimentation campaigns, each experiment must be used to define, design and improve subsequent experiments. This is mainly for experiment-specific partners (Platforms and owning SP), but may also provide feedback to improve SP2 methods (updates to the Experiment Design Manual)
- **Analyse effectiveness from dissemination and sustainable impact perspective.**

Evidence, analysis and report including research questions for follow-up experimentation must be made available in the DRIVER Reference Database (DRIVER task 22.1).

6. Draw conclusions

One of the most important parts of the experiment design is to draw meaningful conclusions. These conclusions are mainly related to the research questions defined at the onset, but may and should include results of relevance for DRIVER as a whole and the European Civil Protection system as a whole.

The conclusions must at least cover:

- **The goals for next experiment**. Learning from the experiment, new goals must be suggested for the next iteration, or for the next level of complexity. Ideally, these conclusions are discussed with the responsible for the next experiment.
- **Identify gaps and solutions**. Given the results of the experiment, conclusions must be drawn on the next steps for development (in the owning SP) and for design of forthcoming experiments.

Identify gaps and solutions for developing EU Crisis Management capabilities. Conclusions should go beyond DRIVER and should be formulated in a way that they are useful for the Civil Protection system as a whole: they should identify the most useful mechanisms for addressing the identified gaps, including a need for fundamental research, Platform development, industry R&D, creating markets, legislative changes and other mechanisms.

Annex 5: Planning of SP5 experiments at the time of suspension

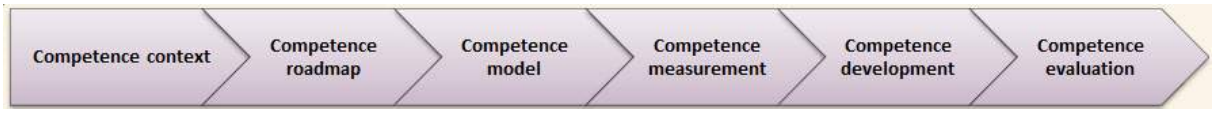
SE2 planning

In this section the SP5 work packages with related experiments are presented at the time of suspension. Cross references are included to the SE2 plan in Annex 1. The SP5 experimentation activities are light-weight – particularly compared to SP4 – and therefore some of the experiments have transformed in a gradual way.

Competences and a competence framework (WP52)

The use of competence frameworks in crisis management differs in scale and scope across Europe (and internationally). The competence framework, details and background of which are set out in D52.1, consists of a set of components that provide the foundations and conceptual arrangements for systematically designing, implementing, monitoring, reviewing and continually improving competence management activities. Our framework includes modules on context, roadmap, model, measurement, development and evaluation of competences. In this sense, the competence framework lays out a structure that can be used for comparison across organisations and countries. Moreover, competence frameworks for crisis management promote the professionalization of actors in crisis management.

Competence framework



Experiment series 1 (EXPE52.3):

- Workshops July 2015 – February 2016
- 3 functions:
  - gain end-user perspective on CF and its modules
  - identify activities already done in the context of the CF
  - identify training & learning activities based on competence management

Experiment series 2 (EXPE52.4):

- I-Self to measure competencies cross-border, cross-organisational

Lessons learned and a lessons learned framework (WP53)

Successful implementation of Lessons learnt processes for crisis management is a challenge. The Lessons learnt framework will be a set of recommended definitions, approaches, methods and tools helping the development of common strategies and processes for the collection, analysis and sharing of lessons. It will improve the ability to analyse and share lessons cross-border, cross-sector and cross-phase, despite differences in contexts. The tools will also support the ability to decide on its

validity both in the original context and in other contexts. The framework will also help decision-makers focus the collection of lessons on the most important subjects.

Lessons learned framework

Experiment series 1 (not in Annex 1):

- Interviews, workshops and questionnaire October 2014 – April 2015
- Goal: gain end-user perspective on LL framework, its modules and its practical application

Experiment series 2 (EXEP53.3/4):

- Workshop format, planned April – October 2016
- Goal: test of tools and measures.

Training for high-level decision makers (WP54)

Involvement of the high-level decision-makers in a larger scale (cross-border) crisis is inevitable. Thus it is important to raise their awareness of, and knowledge about, crisis management, and specifically about making decisions in this type of environment. Where possible, we will build upon trainings already available within EU countries to aid trainers in selecting the best possible training. We will also evaluate the use of new training products, like serious gaming, with the target audience.

Figure 17: Training of high-level decision makers

Experiment series 1 (EXPE54.2):

- Workshops and questionnaire December 2015
- Goal: inform participants about possible trainings to support high-level decision making

Experiment series 2 (EXPE54.3/4):

- Workshop format
- Goal: test training – delayed: should have started April 2016

Training for the crisis management professionals on the collaboration between professionals and the general public (the spontaneous volunteers) (WP55)

People at an incident location start helping others, if this is possible and necessary, before emergency services arrive on the scene. This can be a starting point for collaboration with the professionals. However, in a crisis situation, there is hardly time to negotiate between professionals and spontaneous volunteers. We will develop trainings and support tools that will aid professionals to evaluate when the general public can be (safely) involved and what tasks they can (effectively) perform both during the response and recovery phase.

Awareness training basics (EXPE55.2)

Module	Objectives
Behaviour of the general public	• Understand the types of public behaviour during crisis situations • Understand how the general public behaves in a stressful situation • Observe and identify types of public behaviour • Understand how this behaviour could have implications for the tasks of the first responders' tasks
Behaviour of the first responders	• Understand the types of first responders behaviour • Observe when those types of behaviour can appear/or be manifested • Understand how the professional behaves in relation to general public • Understand how the different types of behaviour could have implications in the effectiveness in the response phase actions
Application in daily work	• Summarize participants' or others' recent experiences on collaboration with the general public • Discover the opportunities for collaboration with the general public considering the influence of the aspects tackled in the course

Table 4: Awareness training basics

Experiment series 1:

- Training pilot: May 2016
- Goal: to pilot the training and elicit feedback in order to iteratively improve and fine-tune the training

Experiment series 2:

- Workshop format, planned October 2016
- Goal: carry out and evaluate training

Psychological first aid training basics

Basic element	Specific learning objectives
Stay close	• Understanding the importance of staying close by the person in need, even if the person doesn't want to talk, should not be left alone. • Understanding the implications of culture, gender and age in assessing the appropriateness of touching another person.

Basic element	Specific learning objectives
Listen actively	• Understand the different techniques of active listening (asking questions, paraphrasing, summarizing).
Accept feelings	• Understand that persons in need can have different emotional reactions. • Understand the importance of confirming the person's feelings without being judgmental.
Provide general care and practical help	• Understand why listing and locating different facilities and services for affected is important. • Understand how to use the dialogue with the person in need to assess different practical needs.

Table 5: Psychological first aid training basics

Experiment series 1 (EXPE55.3):

- Focus group May 2016
- Goal: to validate the PFA scenarios

Experiment series 2 (EXPE55.4):

- Questionnaire, focus group, planned November 2016
- Goal: test effectiveness of PFA training and scenarios