



H2020 - 700478

RAAdars for loNG distance maritime surveillancE and Search and Rescue opErations

EUROPEAN SEA BORDER SURVEILLANCE AND SHIP REPORTING SYSTEMS: CASE EUROSUR

Deliverable Identifier:	D2.1
Delivery Date:	September 30, 2016
Classification:	Dissemination Level (<i>PUBLIC</i>)
Editor(s):	Markus Silvasti (Laurea University of Applied Sciences)
Document version:	1.1 - 2016
Contract Start Date:	May 1 st , 2016
Duration:	42 months
Project coordinator:	EXUS Software Ltd. (UK)
Partners:	EXUS (UK), DXT (FR), ICCS (GR), TUD (DE), LAU (FI), FNM (IT), TEL (GR), NATO (BE), HMOD (GR), DMA (FR)

This work was performed within the RANGER Project, with the support of the European Commission and the Horizon 2020 Programme, under Grant Agreement No.700478



Document Control Page

Title	European Sea Border Surveillance and Ship reporting Systems: case EUROSUR	
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Security Assessment	<input checked="" type="checkbox"/> passed <input type="checkbox"/> rejected Comments:	
Format	Text - Ms Word	
Language	en-UK	
Work-Package	WP2	
Deliverable number	D.2.1	
Due Date of Delivery	30/09/2016	
Actual Date of Delivery	10/10/2016	
Dissemination Level	One of the following: Public	
Rights	RANGER Consortium	
Audience	<input checked="" type="checkbox"/> public <input type="checkbox"/> restricted <input type="checkbox"/> internal	
Date	10/10/2016	
Revision	Marco Evangelista (FNM) and Nikos Chrisopoulos (HMOD)	
Version	1.1	
Edited by	Markus Silvasti	
Status	<input type="checkbox"/> draft <input checked="" type="checkbox"/> Consortium reviewed <input checked="" type="checkbox"/> WP leader accepted <input checked="" type="checkbox"/> Project coordinator accepted	

Revision History

Version	Date	Description and comments	Edited by
0.1	08/07/2016	Document blueprint drafted	LAU
0.2	10/08/2016	Draft version sent for comments	LAU
0.3	24/08/2016	First version sent for contribution	LAU
0.4	02/09/2016	Second version sent for contribution	LAU
0.5	/09/2016	Partner contribution	NATO, DMA
0.6	23/09/2016	Third version sent for review	LAU
0.7	26/09/2016	Final version sent for review	LAU
0.8	28/09/2016	Final version reviewed	LAU, FNM
0.9	3/10/2016	Final version reviewed	LAU, HMOD
0.95	5/10/2016	Coordinator check and final modifications	EXUS
1.0	6/10/2016	Final version	LAU
1.1	10/10/2016	Coordinator check and final modifications	EXUS

Executive summary

This document analyses current state of the European Border Surveillance System (EUROSUR). EUROSUR will be assessed in the light of the RANGER project objectives in order to ensure that RANGER will contribute and maximise its impact at the very same time when promoting the implementation of EUROSUR.

The analysis of EUROSUR is based on desktop study, reviewing relevant policy papers and academic reports. Deliverable 2.1 will focus on EUROSUR's operational and technical aspects, while other aspects of EUROSUR (e.g. political, social, ethical) will be assessed in other reports (e.g. D3.1, D3.3).

This report will define the criteria for benchmarking the RANGER project against EUROSUR framework. These common requirements for benchmarking will be drafted based on EUROSUR Regulation (EU) No 1052/2013 and technical features of the EUROSUR system as described in Regulation above. By providing a comparative SWOT analysis of EUROSUR and RANGER, means for strengthening EUROSUR through RANGER project can be identified.

RANGER project aims to establish new knowledge and to explore the feasibility that RANGER solution can serve as improved technology, product, and service for EUROSUR. As a part of research and innovation action this report is based on academic research. It has been interesting to note that when public bodies (EU Commission, Frontex) have viewed EUROSUR mainly in positive terms, civil society (research, social interest groups) have been highly critical against it. Where official reports have highlighted the benefits of EUROSUR, research has mainly focused on EUROSUR's disadvantages for individuals and societies as a "surveillance behemoth". Criticism has focused on:

- negative side-effects of current border policies (human tragedies, criminalization of migration, militarization of border, etc.)
- expanded role of Frontex in maritime surveillance at the expense of Member States
- infringement of fundamental and human rights (privacy, data protection, right to asylum, non-refoulement)
- efficiency and proportionality of such multi-purpose system
- costs that are significantly higher than expected.

Criticism against intensified maritime surveillance and use of the-state-of-the-art technology has to be taken seriously in RANGER project. It seems obvious to disseminate relevant data (e.g. through project website, leaflets, presentations, articles, etc.) and communicate the benefits of RANGER (enhanced situational awareness and reaction capability, cost-efficiency, etc.). Use of participatory measures (surveys, interviews, workshops) for end-user involvement whenever possible may promote RANGER solution implementation in the future. Concerns regarding data protection and privacy can be taken into account by adhering to privacy by design approach.

In many EU countries law enforcement are struggling with ever-diminishing public funding. It is highly important that future technological applications demonstrate not only improved performance but improved cost efficiency. Frontex has also emphasized adapting EUROSUR to the declining resources. According to Frontex report (2015) on the functioning of EUROSUR: "For the development of Operational Layer further integration work will be carried out as requested by the Member States aiming at increased effectiveness, reduced operator workload and improved user experience (ibid. 12). In order RANGER to achieve its objectives and become part of the future EUROSUR system, it is important to demonstrate the operational, functional, and economic benefits of RANGER solution during the project, and thereafter.

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1. Introduction

The purpose of this report is to make a state of the art assessment of EUROSUR. RANGER project is planned to improve vessel detection, recognition and identification, hence, improving EUROSUR systems situational awareness and reaction capability. In order to ensure that RANGER will meet its pre-set objectives it is important to analyse current state of EUROSUR. Analysis is done based on official reports and research findings. The purpose of analysis is to set benchmarking criteria both for the objectives and for the final results of RANGER project. This is achieved by making SWOT analysis both for EUROSUR and RANGER project.

EUROSUR (framework) is composed of both national and European components. National component includes national coordination centre (NCC) and national situational picture (NSP). Other parts of EUROSUR (communication network, European situational picture (ESP), European pre-frontier intelligence picture (EPIP) and common application of surveillance tools) fall into responsibility of Frontex. Formation of an overview of the EUROSUR would require examination of implementation on EUROSUR both national and EU level. Due to the fact that national implementation of EUROSUR will be discussed in Deliverable 3.7, this document examines things only at the EU level.

The structure of this document is as follows:

- Section 2 describes theoretical tools used for analysis of EUROSUR. The same methodology is used providing information on EUROSUR roadmap within WP3 in Deliverables 3.7 and 3.8.
- Section 3 presents EUROSUR based on European Commission Regulation (EU) No 1052/2013.
- Section 4 illustrates the current situation of EUROSUR in the light of official reports and academic research. Official “status quo” will be defined based on Frontex report on the functioning of EUROSUR while academic research is mainly interested in the societal side effects caused by EUROSUR.
- Section 5 defines criteria for benchmarking RANGER project against EUROSUR framework.
- Section 6 assess both EUROSUR and RANGER project with the help of SWOT-analysis mapping means for strengthening EUROSUR through RANGER. The last section 6.3 translates research findings into recommendations and requirements for RANGER project.
- Section 7 presents the most important findings and discuss their importance for the RANGER project.
- Annexes present list of references (Annex A) and used Acronyms in the document (Annex B).

2. Methodology

2.1 General remarks

RANGER project is funded by Horizon 2020 Programme aiming among others to establish new knowledge and to explore the feasibility of RANGER solution as improved technology, product, and service for EUROSUR. As a part of research and innovation action it shall be based on research, meaning that argumentation and validation of the end results (e.g. deliverables) have to be based on academic research and scientific methodology. This is the main reason for the chosen approach in this report.

This chapter will describe the methodology used in this report. The main methodology is qualitative analysis which is used for reviewing policy papers and research reports. This qualitative analysis is enriched with Affinity Diagram method (see below). Due to all people judge EUROSUR from their own perspective, sense-making theory is used to understand different views and to reach a rich debate around EUROSUR. Communities of Practice (CoP) approach helps to understand practical, law enforcement view on EUROSUR. Respectively, policy analysis is required to review EUROSUR and its implementation. Participation measures contribute providing views of different stake holders. SWOT analysis is used for mapping recognized strengths, weaknesses, opportunities and threats both of EUROSUR and RANGER, in order to define benchmarking criteria and means for strengthening EUROSUR by RANGER Project.

It is noteworthy to say that theoretical and methodological decisions affect the structure and the results of the report. Many researchers (Torraco 2002; Storberg-Walker 2008) have pointed out how different theories, research methods and approaches produce different knowledge. Furthermore, sense-making and CoP approaches underline how meaning is negotiated through a process of participation and reification (Wenger 1998). This may help to understand if findings documented in this report differ from previous research findings due to knowledge on EUROSUR is coproduced with consortium partners with a joint effort.

One major challenge to produce report on EUROSUR is to get public or qualified data (Bellanova & Duez 2016). Security - in the field of inquiry or area of knowledge – is considered as concealed with secrecy and restricted availability. This is due to the nature of security knowledge (Eklblom 2014) and self-restraint practices of security communities (Adler 2008). Knowledge on state security and functioning of law enforcement (e.g. EUROSUR system) is classified information not available for the public. Organizational culture of security authorities have a role, too. According to Adler (2008, 204) security members share rational and moral expectations and dispositions of self-restraint. Hence, it is not surprising why very little is publicly known about EUROSURs operative status to date. Most official reports on functioning of EUROSUR (technical studies, pilot projects) have not been made fully available for the public. Furthermore, only few academic publications have engaged¹. For this reason this document is based on scarce public material as EU policy papers (e.g. Regulation, legislative proposals, Commission staff working papers like impact assessments), Frontex reports, and academic research on EUROSUR. The system as such

¹ In Web of Science portal one can get only two hits with term “EUROSUR” when running a search. Web of Science is most comprehensive and versatile research platform available containing more than 10.000 journals and over 1 billion (1x10⁹) reviewed articles.

is introduced based on Commission Regulation (EU) No 1052/2013 that defines the functionalities of EUROSUR system.

Research papers and official reports will be analyzed with Affinity Diagram (AD) method (sometimes referred to as the KJ Method according to its discoverer Kawakita Jiro). It is originally a business tool used to organize ideas and data. The tool is commonly used in project management and allows large numbers of ideas stemming to be sorted into groups. Grouping data into groups is based on natural relationships through brainstorming. It is also used in contextual inquiry as a way to organize notes and insights from surveys, interviews, or other qualitative research (Foster 2010).

2.2 Sense-making theory

Sense-making is a social process by which people give meaning to experience. Sense-making describes the processes by which individuals interpret and reinterpret events which take place, and put them in a context to make sense of what is happening. This process occurs at the sub-conscious and conscious levels. In organizing their understanding of what is happening, individuals create plausible, but not necessarily correct, explanations, which lead to action. (Weick 1993; 1995.) This process has been studied in many disciplines under other names. The term "sense-making"² has primarily marked three distinct but related research areas: human-computer interaction by PARC researchers Russell, Stefik, Pirolli and Card; information science by Brenda Dervin, and to organizational studies by Karl E. Weick.

Some basic concepts such as situational awareness and “cognitive cap” that individuals experience when attempting to make sense of observed data may provide information science as promising approach. In addition, Weick’s ideas on organizational knowledge and sense-making as a tool in working with complexity, ambiguity and uncertainty helps to construct ‘sense’ while analyzing incompatible data. Besides sound theoretical support for analysis, sense-making approach is used as diagnostic tool in the analysis of qualitative data. It outlines how anomalous data (“what is going on here?”) led to deeper interpretation, and an important finding relating to the phenomenon under investigation.

According to Weick (1993; 1995) sense-making has seven properties. Identity and identification is central shaping how people interpret events. Retrospection affects what people notice and how they enact the environment. As people speak, and built narrative accounts, it helps them understand what they think, and how they organize their experiences. Sense-making is social and ongoing process where individuals simultaneously shape and react to the environment. The basic idea of sense-making is that reality is an ongoing accomplishment that emerges from efforts to create order and make retrospective sense of what occurs. Finally, people extract cues from the context to help them decide on what information is relevant and what explanations are acceptable.

² In information science the term is most often written as "sense-making." For the sake of consistency sense-making is written in this document with hyphenated spelling regardless of its theoretical orientation. Both in information science and organizational studies, the concept has been used to bring together insights drawn from philosophy, sociology, and cognitive science (especially social psychology). Hence, sense-making research is often presented as an interdisciplinary research program.

Extracted cues provide points of reference for linking ideas to broader networks of meaning and are 'simple, familiar structures that are seeds from which people develop a larger sense of what may be occurring.

One basic assumption of sense-making is that of discontinuity. Sense-making responds to ambiguity and uncertainty. There are gaps between entities, time, and spaces. Each individual is an entity moving through time and space, dealing with other entities which include other people, artefacts, systems, or institutions. The individual's making of sense as a strategy for bridging these gaps is the central metaphor of the sense-making approach. (Spurgin 2006.) In other words, inadequacy of their current understanding of events is one of the key findings of sense-making. Furthermore, sense-making is an active two-way process of fitting data into a frame (mental model) and fitting a frame around the data. Neither data nor frame comes first; data evoke frames and frames select and connect data. When there is no adequate fit, the data may be reconsidered or an existing frame may be revised. (Klein et al. 2006.) Discontinuity of information - or "gappiness" - may explain why different stake holders (policy makers, law enforcement, interest groups, citizens, researchers) have such contradicting views concerning border control and European border surveillance system EUROSUR.

It is noteworthy that sense-making does not make any distinction between knowledge and information. Primary emphasis is placed on moving conceptualizations of users, information and reality from the noun-based knowledge of the past to verb based frameworks emphasizing diversity, complexity and sense-making potentials. Sense-making (and sense-unmaking) is an activity, embedded in time and space, moving from a history toward a horizon, made at the juncture between self and culture, society, and organization. In this way sense-making conceptualized knowledge and information not as a noun, as a thing or a commodity that can be captured, but as a verb which is always in the state of becoming. (Dervin 1998.)

In the same way Spurgin (2006) has claimed, the conceptualization of information as process leads directly to sense-making's focus on "verbings" rather than nouns. A sense-making approach requires a focus on what people do, how they do it, and why they do it that way, rather than on the objects that people do things with. Sense-making is about action - what's going on here - followed by what do I do next? Because people are always in the middle of things, sense-making involves updating and is progressive. Hence, knowledge is uncertain and something that always is sought in mediation and contest. Respectively, information as a static absolute term (information-as-thing), is a disappearing category and should be qualified with a phrase like 'information as defined by the expert'. (information-as-construction) (Agarwal 2012).

For any inquiry and report aims to generate new knowledge. Inspired and informed by a sense-making view of organizations (Weick 1995; Wiley 1994), this report focuses on knowledge as both a subject and a product of sense-making by individuals, groups and organizations. By referring to four different levels of sense-making in organizations (intra-subjective, inter-subjective, generic subjective and extra-subjective), a model of knowledge management that identifies four respective types of knowledge can be presented: individual, collective, organizational and cultural knowledge. At each level, a point of view is different and meanings are created differently. Consequently, the nature of knowledge and its creation at each level are different. (Cecez-Kecmanovic et al. 2003). This may be one reason why knowledge on EUROSUR differs when it is pictured in individual (research), organizational (Frontex), or cultural (EU) level.

Discussion above have illustrated how sense-making mandates attention to sense-making very broadly. It does not distinguish, for example, data from information from knowledge and instead looks for fodder that informs sense-making by whatever name it might be called. To this end, ideas and cognitions, feelings and emotions, questions and muddles, angst and hunches, dreams and

wishes are all elicited. Sense making mandates attention not only to the material embodiment of knowing, but to the emotional/feeling framings of knowing as well. Sense making assumes that the entire human package – body, mind, heart, soul – is simultaneously verbed, constantly evolving and becoming, and intricately intertwined.” (Dervin 1998.) Importance on feelings and emotions in human knowledge creation process may shed some light to understand why EUROSUR have been heavily criticized by social interest groups and advocates.

Sense-making mandates the embodiment of knowing by paying attention to arenas of maximum disagreement and maximum agreement. Sense-making never focusses on arriving at right answers or best knowledge. Hence, sense making forces attention to the full range of diversities that pertain to a situation. Besides this new potential for knowledge creation through releasing creativity and diversity, sense making approach is useful to empower people to engage. Several studies indicate when diversity is treated within sense making’s approach, users do not need to know all perspectives on a question to be usefully informed and satisfied with participation.

As discussed in this section, sense-making is promising approach to view and manage different data and understand various perspectives and interpretations of reality – e.g. “what’s going on here”, “how things are” or “how they should be”. In addition, sense-making approach promotes wide participation of different stakeholders which helps achieving established project goals and validating the results. It is noteworthy to say that sense-making approach has been used for assessment of extensive data systems. For example, Boin et al. (2014) use sense-making approach in their study while analyzing European crisis management systems. EUROSUR was one of the four case studies under scrutiny.

2.3 Communities of Practise (CoP)

The concept of Communities of Practice (CoP) has become popular in several academic fields like organizational studies (particularly the topics of knowledge management and organizational learning), education, communication studies, information science, and linguistics. However, the usage of the term is very diverse and there are many readings on CoP. Sometimes it is a conceptual lens through which to examine the situated social construction of meaning (cf. sense-making). At other times it is used to refer to a virtual community or informal group sponsored by an organization to facilitate knowledge sharing or learning. Many of the transnational communities and networks discussed in the IR literature (e.g. ‘security communities’) may be seen as subsets of communities of practice.

According to Wenger et al. (2002, 4) CoP can be defined as “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis”. Hence, CoPs may not normally work together, but who are acting and learning together in order collectively to achieve a common task while acquiring and negotiating appropriate knowledge (Gabbay et al. 2003, 285). CoP refocus on innovation and creative insights on problems. One reason why CoP is regarded as useful approach for this study is that the community of practice concept has a continuing appeal for likeminded groups of practitioners (Cox 2005). Furthermore, CoP foster new groupings of people who work on similar or parallel, not joint, enterprises (practices), effectively to invent new practices. Community of practice is linked to the notion of new forms of less hierarchical, ‘virtual organizations’, especially relevant in ‘knowledge industries’ like management consultancies and software development houses, supposedly a new paradigm of organizational structure (Alvesson 2004).

As discussed above CoP “consists of people who are informally as well as contextually bound by a shared interest in learning and applying a common practice” (Snyder 1997, cited in Adler 2008, 199). More specifically, it is a configuration of a *domain of knowledge* that constitutes like-mindedness,

a *community of people* that ‘creates the social fabric of learning’, and a *shared practice* that embodies ‘the knowledge the community develops, shares, and maintains’ (Wenger et al. 2002, 28–9). The knowledge domain endows practitioners with a sense of *joint enterprise*, which ‘brings the community together through the collective development of a shared practice’ and is constantly being renegotiated by its members. People function as a community through relationships of *mutual engagement* that bind ‘members together into a social entity’. Shared practices, in turn, are sustained by a *repertoire of communal resources*, such as routines, sensibilities, and discourse (Wenger 1998, 72–85, 209).

CoP can incorporate so many concepts because it encompasses not only the conscious and discursive dimensions and the actual doing of social change, but also the social space where *structure* and *Frontex* overlap and where knowledge, power, and community intersect. CoP are intersubjective social structures that constitute the normative and epistemic ground for action, but they also are agents, made up of real people, who — working via network channels, across national or organizational lines, and in the halls of government — affect political, economic, and social events. As such, CoP helps mediate between structure and social action, especially when background knowledge becomes reified in practice.

Although CoP are everywhere, they transcend our obvious classifications of social phenomena. They may be grasped only analytically and relationally, as social spaces that are organized around practices and in which meaningful social relations take place on the basis of ‘weak ties’; where practitioners ‘are known only in one very limited respect and ... may *never* be encountered face to face’ (Urry 2004, 116; Granovetter 1973). Still, CoP are grounded in places and represented in the material world (Sassen 2000). They differ from the oft-used concept of ‘network’ (Castells 1996), mainly because they involve not only the functional interpersonal, inter-group, and inter-organizational transmission of information as networks do, but also processes of social communication and identity formation through which practitioners bargain about and fix meanings, learn practices, and exercise political control.

Because the boundaries of CoP are determined by people’s knowledge and identity and by the discourse associated with a specific practice, CoP, unlike networks, are not necessarily “congruent with the reified structures of institutional affiliations, divisions and boundaries” (Wenger 1998, 118–9). As boundaries form in and around practice, CoP link up with their social environments and with other CoP to form community-of-practice constellations (Wenger 1998, 129); e.g. diplomats and security analysts or brokers and financial consultants. CoP are not international actors in any formal sense, but they coexist and overlap with them.

According to Wenger (1998, 55), within CoP, meaning is negotiated through a process of participation and reification. Wenger (ibid. 58) defines the concept of reification as the process of giving form to experience by producing objects. “Any community of practice produces abstractions, tools, symbols, stories, terms, and concepts that reify something of that practice in a congealed form” (ibid. 59). Such forms take on a life of their own outside their original context where their meaning can evolve or even disappear.

Finally, we must establish yet another argument, which argues in favor of CoP approach - *shared documents*. The major point of interest to come out of the study is the use of project documents as shared artefacts for communicating and sharing soft knowledge within the community and across national and cultural boundaries. The process of creating documents allowed the members of CoP (RANGER Project) to share their soft knowledge through interaction. The creation of the document involved the consortium members in meeting and collaborating. They discuss issues and apply their knowledge to solve the problems and create new knowledge and understanding of EUROSUR. They benefit from the *process*, rather from simply making a document.

2.4 Policy assessment

Evaluation of the policy outcomes is key question and main concern in policy assessment. It can take many forms and theoretical approaches. Different conceptions and theoretical frameworks have been developed for analytical purposes. Even in the highest conceptual level there are not consensus whether one should speak policy assessment, analysis, evaluation, or something else. This chapter makes a short cross-section of the most used approaches.

Policy assessment is most commonly practiced as one or several types of ‘impact assessment’. There is a range of policy assessment tools and methods such as cost-benefit analysis (CBA), performance audit or performance management, PEST analysis³, scenario analysis, multi-criteria analysis (MCA), means-ends analysis, and computer modelling (Adelle & Weiland 2012). Hence, there is no ‘one way’ of conducting policy assessment, or even one ‘best way’. There are also quantitative methods for public policy evaluation like causality (causation through regression models), estimating the impact of policy interventions and cost benefit analysis in public policy evaluation.

Then there are more ‘practical’ approaches. According to Kugler (2006) the key questions to be answered in *policy analysis* is as follows:

- What goals does a particular policy seek to achieve, and why?
- What activities will this policy carry out, what resources will it need, and what will they cost?
- What are the reasons for believing that the policy’s proposed actions will attain its goals?
- What are the potential consequences of this policy, intended and otherwise?
- To what degree is the policy likely to be effective?
- What will be its cost-effectiveness—the balance between resources expended and goals attained?
- What is the risk that the policy will fail or even make the situation worse?
- What are the risks that, even if it achieves its own aims, the policy will damage other goals in other arenas, and perhaps do more harm than good?
- All things considered, will this policy yield a satisfactory achievement of its goals at an acceptable price?
- How does it compare to other policy options that seek the same goals with different activities and costs?
- Would another policy be equally effective and cost less, or cost the same and achieve more?
- If no clear winner emerges among several options, how can their tradeoffs be assessed?
- On balance, which option makes best sense?

³ **PEST analysis** (political, economic, social and technological) describes a framework of macro-environmental factors used in the environmental scanning component of strategic management. It is part of an external analysis when conducting a strategic analysis or doing market research, and gives an overview of the different macro-environmental factors to be taken into consideration. It is a strategic tool for understanding market growth or decline, business position, potential and direction for operations. It is used in many forms such as **PESTEL** or **PESTLE** (which adds legal and environmental factors), **SLEPT** (adding legal factors), **STEEPLE** and **STEEPLED** (adding ethics and demographic factors), **DESTEP** (adding demographic and ecological factors) and **SPELIT** (adding legal and intercultural factors).

In the same way the field of *policy evaluation* is characterized by a wide variety of approaches, due to “infinite potential configurations of purpose, technique, concepts, actors served and institutional forms” (Hellstern 1986, 290). However, the taken-for-granted, common sense approach to policy evaluation derives its logic from the conceptualization of the process of policy formulation and implementation as a rational cycle of goal specification, design, implementation, evaluation and redesign – what Jenkins-Smith and Sabatier (1993) call the ‘stages heuristic’. (Sanderson 2000.) Using *empirical* assessment (Caragliu & Bo 2015) or integrating quasi-experimental and inductive designs in evaluation of ‘policy experiments’ (pilot projects) (Green et al. 2015) have been recommended to strengthening both internal and external validity in evaluations.

One of the perennial issues in policy literature is the tension between policy analysis and evaluation. In broad terms, policy analysis is understood to be shot through with value conflicts, political decisions and priorities, but evaluation is typically seen as the application of relatively neutral, social scientific research techniques to policy issues. Hence, evaluation is a subset or phase of policy analysis that is primarily research-oriented. There are important differences between evaluation and analysis in terms of conceptualization, function, target audiences, research methods, problem definition and data presentation and argumentation. These differences do not make one superior to the other. (Geva-May & Pal 1999.)

Normally, evaluation tries to provide answers to causal questions. Typically these will be questions of impact (what was the effect of program X on outcome Y? or of goal A on object B?) or efficiency (cost/benefit). Evaluation is usually conducted *post facto*, or may be a preliminary exercise probing costs and effects of a range of policy options. Good evaluations answer questions that must be answered as objectively as possible, whatever the normative wishes of the evaluator or the client. In principle, evaluation should not make recommendations based on the answers obtained but merely present data – since recommendations depend on more than the evaluation results. Policy analysis, however, is primarily about making recommendations on preferred or best options. These recommendations will be based on research (much of which is provided by previous evaluation studies) but will typically go well beyond it. (Geva-May & Pal 1999, 261.)

To speak of ‘evaluation’ and of ‘policy analysis’ implies a firm distinction that sometimes does not exist in practice. As House (1993) notes, evaluation has recently moved from monolithic to ‘pluralist conceptions, to multiple methods, multiple measures, multiple criteria, multiple perspectives, multiple audiences, and even multiple interests’ (ibid. 3). The increasing reliance on qualitative techniques and methods is one example.

Focus on temporal dimension of analysis can act as one of dividing line between different forms of analysis. Analysis, assessment or evaluation can be done *ex ante*, *ex post* or in *real-time*. *Ex ante* assessment informs decision makers before policies are agreed and implemented while *ex post* assessment is used afterwards to evaluate impact of policy measures. Real-time evaluation (RTE) refers, in this report, to progressive forms of policy evaluation that follow policy processes underway. RTE scrutinizes dynamic processes. A basic characteristic of such policy evaluation is that changes generally take place throughout the policy process: the object of evaluation is a moving target.

Currently stakeholders have not been involved in policy assessment. More recently, many researchers (Randaelli 2004; van der Knaap 2011; Adelle & Weiland 2012) have recognized the need to be more open and responsive to the needs and preferences of target groups and stakeholders. This is one reason why views of different stakeholders are collected and participatory measures are used to provide multi-dimensional knowledge on EUROSUR.

In social science research evidence is central to development and evaluation of policy. But evidence-based policy making presents challenges for researchers as the delivery of the right information. In order to understand and explain public policy, different stakeholders' perceptions of the policy problem need to be scrutinized. That is because public policy is generally developed in multi-actor contexts. A policy evaluation should also facilitate the interpretation of policy in a broader context. Contemporary concern to address 'cross-cutting' issues has been taken into account.

Boaz and Hayden (2002) have in their article "Pro-active Evaluators: Enabling Research to Be Useful, Usable and Used" developed evaluation framework for action research.

In contrast to a perceived culture of externally imposed checks and league tables, they have promoted creation of formative, action-research evaluation framework which:

- understand why change is needed – through collection of baseline information on demographic and socio-economic trends, issues facing target groups, gaps in services etc.
- inform on what is possible – through recording good practice examples with evidence of effective outcomes in terms of improved information, services, opportunities etc.
- learn how change can be introduced – through tracking processes to determine critical factors for a successful strategic approach, e.g. partnership development, stakeholder's engagement, leadership etc. (Boaz & Hayden 2002)

In the same way GRANGER & Maynard (2015) have emphasized this "what works" approach to policymaking and practices for improving impact evaluations. They suggest three ways to make impact evaluations more relevant to policy and practice:

- Emphasize learning from all studies over sorting out winners and losers.
- Collect better information on the conditions that shape an initiative's success or failure.
- Learn more about the features of programs and policies that influence effectiveness.

"What works" is closely connected to policy failure. McConnell (2015) provides a working definition of failure, namely that a policy fails, even if it is successful in some minimal respects, if it does not fundamentally achieve the goals that proponents set out to achieve, and opposition is great and/or support is virtually non-existent. One of the most prevalent is single case studies of failure. According to research, examples include Hurricane Katrina, Australian asylum seeker policy, and US Department of Homeland Security, anti-money laundering (AML) policies, the 'war on drugs', such as costs outweighing benefits (Sharman 2011), the non-achievement of policy making goals, and the 'implementation gaps'. Hogwood and Gunn (1984) describe policy failure as either non-implementation where the policy is not put into effect as intended, or unsuccessful implementation where, the policy is enacted but circumstances are such that the policy fails to achieve the desired outcomes or results.

These various approaches of policy assessment are used, not in a rigor sense but as a heuristic tool aspiring more comprehensive and holistic approach, an open evaluation framework which loose mix of criteria. They can facilitate a broader interpretation of the policy process providing more nuanced picture of EUROSUR. For that purpose EUROSUR will be assessed against its policy goals and main objectives. This may help RANGER project to avoid some potential hardships when aspiring towards its ambitious goals.

2.5 SWOT analysis

SWOT is an acronym for a strategic planning tool used to evaluate in a systematic way the internal strengths (S) and weaknesses (W) and the external opportunities (O) and threats (T) of a project or business venture. Though originally designed for planning and strategy development, SWOT has been widely used for business and marketing. It can be also used in ex post evaluations

(Wezemaal et al. 2012) and competitor evaluation (cf. EUROSUR vs. RANGER). SWOT analysis may also be used in creating a recommendation during a viability study or survey. In addition, it has been utilized in community work as a tool to identify positive and negative factors within organizations, communities, and the broader society that promote or inhibit successful implementation of social services and social change efforts.

In research it has been used in many domains, like evaluation of mixed participatory measures, business process outsourcing and evaluation of information enabled services. Some researchers regard SWOT as an atheoretic classificatory system. Anyway, the main advantages of using SWOT analysis relate to its user-friendly application, the simple format, and the adaptability to a variety of situations, people, and events (Nicholls et al. 2008, cited in Wezemaal et al. 2012, 126). Choosing SWOT as an evaluation method enables the formulation of clear guidelines on how and what to take care of when applying this participatory method in an alternative context. This is evident in RANGER project where RANGER objectives will be evaluated against EUROSUR and CISE frameworks to provide maximal added-value for the development of European maritime surveillance and Search and Rescue operations.

SWOT analysis is normally structured so that a 2x2 matrix grid can be produced according to two pairs of dimensions:

- strengths and weaknesses
- opportunities and threats

Strengths and weaknesses are regarded as internal factors like the situation in the company, organization or project (RANGER). Opportunities and threats are regarded as external factors like the external environment outside the company or organization. Table 3 below illustrates what the internal and external factors may contain.

<p>Strengths</p> <ul style="list-style-type: none"> - new capabilities - competitive advantages - unique selling points (USP) - resources, assets, people - experience, knowledge, data - innovative aspects - location and geographical aspects - price, value, quality - accreditations, qualifications, certifications - processes, systems - IT, communications - cultural, attitudinal, behavioural values - 	<p>Weaknesses</p> <ul style="list-style-type: none"> - gaps in capabilities - lack of competitive strength - reputation, presence and reach - financials - own known vulnerabilities - timescales, deadlines and pressure - continuity, supply chain robustness - effects on core activities, distraction - reliability of data, plan predictability - morale, commitment, leadership - accreditations, etc - processes and systems, etc
<p>Opportunities</p> <ul style="list-style-type: none"> - technology development and innovation - policy development - market development and new markets - market need for new USP's - industry or lifestyle trends 	<p>Threats</p> <ul style="list-style-type: none"> - political effects - legislative effects - environmental effects - IT developments - competitor intentions - market demand - new technologies, services, ideas

<ul style="list-style-type: none"> - global trends and influences - competitors' vulnerabilities - business and product development - information and research - new partnerships and agencies 	<ul style="list-style-type: none"> - obstacles faced - insurmountable weaknesses - economy - home, abroad
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Table 1: SWOT analysis⁴ matrix

SWOT analysis is a very flexible tool. It is important to note that strict categorization of the SWOT dimensions (according to 'internal' and 'external' factors) can be limiting and cause loss of important aspects of the issue. Hence, a more open interpretation of the model can be helpful. For example, limiting the assessment of threats and opportunities to external factors only may miss certain threats and opportunities that can exist (internally) within the company/organization/project. Some internal threats and opportunities can be substantial, for example, opportunities such as: energy-saving, process-improvement, training, advertising, or discontinuing loss-making products, or threats such as: desertion of key staff, the loss of major contracts, to name just a few.

SWOT analysis is typically done by people who are well familiar with a project, situation, or environment (Chapman 2010). In this project SWOT analysis is used by some project partners and the results of analysis will be reviewed and verified by the whole consortium. Hence, the diversity in the backgrounds of the respondents ensured variability in the obtained SWOT components. The limited sample size does not endanger the quality of the results of the SWOT analysis. The significance of the results of a SWOT analysis is determined by the high decision-making position and involvement of the participants rather than by the number of participants. As Langer et al. (2005) have noticed, a SWOT analysis can be legitimately performed by a single analyst, a few managerial participants, or by a group of managerial or highly involved respondents. In this evaluation study, the limited size of the group of individuals who were actively involved in the participatory method led to the limited sample size, though without imperilling the required high position and involvement of the respondents in the project.

2.6 Participation measures

In recent years, there has been growing call for greater public involvement in establishing policy. Involvement may be achieved in different ways: at the lowest level, the public may be targeted with enhanced information (e.g., about risks). At higher levels, public views may be actively solicited through such mechanisms as consultation exercises, focus groups, and questionnaires. At the highest levels, members of the public may be selected to take part in exercises that provide them with a degree of decision-making authority. In this report public participation methods are used to include the public in policy analysis at least to the level of gathering their opinions.

A variety of public participation procedures exist that aim to consult and involve the public (see Petts et al. 1996; Petts & Leach 2000; Rowe & Frewer 2000; Abelson & Gauvin 2006). Some

⁴Table have been modified (simplified) from free templates retrieved from <http://www.businessballs.com/swotanalysisfreetemplate.htm> [Accessed 25 September 2016].

methods are traditional (e.g. public meetings, surveys, interviews, questionnaires) while others are more innovative (e.g. community advisory committee, citizens' jury, visioning); some are aimed at eliciting views (e.g. workshops, focus groups/forums) while others aim to empower the community (e.g. negotiated rule making); some are used for generating opinions at a strategy-making stage (e.g. community advisory groups, focus groups) while others are used for specific decisions such as option selection (e.g. referenda); some require participants to give an immediate view (public opinion surveys) while others allow time for deliberation (e.g. public hearings); and some are based around particular service areas (e.g. virtual consultation, diagnostic without a doctor) while others are more general in nature (Petts & Leach 2000).

Research literature emphasizes the importance of fitting the method to purpose. Barnes et al. (1997) propose to consider the following questions when selecting participatory methods:

- whose participation is being sought? (e.g. all citizens, or all consumers, or certain groups of citizens or consumers)
- what type of knowledge is being assessed? (e.g. expert, interested, informed, uninformed, factual, value-based)
- what is the source of action to secure participation? (e.g. political systems, service systems, organized groups of citizens)
- what is the purpose of participation? (e.g. empower citizens, improve services, increase accountability, transform views through discussion, satisfy statutory requirements)
- what degree of power-sharing is implied? (e.g. offer advice on options, option generation, take decisions)
- at what level will views be expressed? (e.g. individual, collective)
- at what level will change deriving from participation occur? (e.g. individual, group, neighborhood, social programme, organization)

According to research use of multi-disciplinary approach and multiple methods will maximize impact of public participation (Abelson & Gauvin 2006; Wezemaal et al. 2012). In addition, many studies (Chilvers 2007; O'Cathain 2010; Rowe & Frewer 2000; Wezemaal et al. 2012) have proposed to establish criteria for public participation. Usually criteria measure issues like participation rate, representativeness and inclusivity, transparency and accountability, dialogue and interaction, process openness, fairness and flexibility, feasibility and efficiency, to name but a few. Due to research economy and limited time available for the deliverable (M5) multiple methods are used, but criteria for implementation of participation methods and use of mixed methods will not be defined. In this report the voice of public is mainly heard by research reports. Regarding EUROSUR more intense use of participatory measures are used in Deliverable 2.4 (Gap analysis) and Deliverable 3.8 which (among other things) reports national implementation of EUROSUR.

3. Description of EUROSUR

The main purpose of EUROSUR is to improve the “situational awareness” and reaction capability of the member states and assist FRONTEX to prevent irregular migration and cross-border crime at the EU’s external land and maritime borders. EUROSUR is based on near-real time information exchange between national, European and international border authorities. To provide an up-to-date situational awareness picture and ‘early warning’ system EUROSUR capitalize on intelligence-driven approach in border surveillance.

Due to difficulties to get public data on European maritime border surveillance description of EUROSUR, this document is based on Regulation (EU) No 1052/2013⁵. Reference, if not mentioned otherwise in this report, is done in above-mentioned Regulation.

3.1 General description of EUROSUR

EUROSUR is a common framework for the exchange of information and for the cooperation of Member States among themselves and with Frontex. It was designed to improve situational awareness and increase reaction capability at the external borders of the Member States of the Union. In addition to maintaining and sharing the situational pictures, Frontex also provides information collected from satellites and other surveillance tools at the European level. Member states can use such information to further improve their situational awareness. The collection of these services, called EUROSUR Fusion Services, facilitates access to state of the art technologies, help reduce the duplication of efforts by member states and reduces costs.

With the EUROSUR framework, Frontex has established a technical basis for delivering a European Situational Picture and a Common Pre-Frontier Intelligence Picture respectively at the external borders of the EU and outside. These complementary pictures make the common application of surveillance tools under one single umbrella possible. Frontex coordinates the use of these tools and contributes to coordinated reaction capacity as a main possible operational priority. It is supported by a communication network.

European Border Surveillance System (EUROSUR) is a multi-purpose system designed to improve the management of Europe’s external borders. According to Regulation (EU) No 1052/2013 EUROSUR is a common framework for exchange of information and for the cooperation between the Member States and Frontex (Frontex). It has been launched in 2008 and established by Regulation (EU) No 1052/2013.

Hence, EUROSUR aims to support Frontex (the European Frontex for the Management of Operational Cooperation at the External Borders of the Member States of the European Union) and the Member States by increasing their situational awareness and reaction capability providing a joint response to challenges. EUROSUR will provide Frontex and ‘national’ border control authorities with the infrastructure and tools:

- detecting, preventing and combatting cross-border crime

⁵ Regulation (EU) No 1052/2013 of the European Parliament and the Council of 22 October 2013 establishing the European Border Surveillance System (EUROSUR).

- detecting and preventing irregular migration
- protecting and saving lives of migrants at sea.

According to Article 4 EUROSUR framework includes the following components:

- national coordination centres
- national situational pictures
- communication network
- European situational picture
- common pre-frontier intelligence picture
- common application of surveillance tools.

Description of the main components of EUROSUR framework is done in the following subsections.

3.2 National Coordination Centres (NCC)

Each Member State shall designate, operate and maintain a national coordination centre (NCC) which shall coordinate, and exchange information among, all authorities with a responsibility for external border surveillance at national level, as well as with the other national coordination centres and Frontex.

NCC shall be the single point of contact for the exchange of information and for the cooperation with other NCCs and with Frontex.

Article 5 defines the main tasks of NCC as follows:

- (a) ensure the timely exchange of information and timely cooperation between all national authorities with a responsibility for external border surveillance, as well as with other national coordination centres and Frontex;
- (b) ensure the timely exchange of information with search and rescue, law enforcement, asylum and immigration authorities at national level;
- (c) contribute to an effective and efficient management of resources and personnel;
- (d) establish and maintain the national situational picture in accordance with Article 9;
- (e) support the planning and implementation of national border surveillance activities;
- (f) coordinate the national border surveillance system, in accordance with national law;
- (g) contribute to regularly measuring the effects of national border surveillance activities for the purposes of this Regulation;
- (h) coordinate operational measures with other Member States, without prejudice to the competences of Frontex and of Member States.

The national coordination centres shall provide Frontex, via the communication network, with information from their national situational pictures which is required for the establishment and maintenance of the European situational picture and of the common pre-frontier intelligence picture. NCC shall operate twenty-four hours a day and seven days a week.

3.3 National Situational Picture (NSP)

Situational awareness is based on situational pictures. Every Member States shall have national situational picture (NSP) which shall be produced through the collection, evaluation, collation, analysis, interpretation, generation, visualization and dissemination of information from national maritime surveillance authorities. In EU level, along with NSPs, there will be the European situational picture and the common pre-frontier intelligence picture. According to Article 8 all above-mentioned pictures shall consist of the following layers:

- (a) an events layer;
- (b) an operational layer;
- (c) an analysis layer.

Hence, these layers are discussed only in the context of national situational picture.

According to Article 9 the national coordination centre shall establish and maintain a NSP, in order to provide all authorities with responsibilities for the control and, in particular, surveillance of external borders at national level, with effective, accurate and timely information. NSP shall be composed of information collected from the following sources:

- (a) the national border surveillance system in accordance with national law;
- (b) stationary and mobile sensors operated by national authorities with a responsibility for external border surveillance;
- (c) patrols on border surveillance and other monitoring missions;
- (d) local, regional and other coordination centres;
- (e) other relevant national authorities and systems, including liaison officers, operational centres and contact points;
- (f) Frontex;
- (g) national coordination centres in other Member States;
- (h) authorities of third countries, on the basis of bilateral or multilateral agreements and regional networks as referred to in Article 20;
- (i) ship reporting systems in accordance with their respective legal bases;
- (j) other relevant European and international organisations;
- (k) other sources.

The events layer of NSP shall consist of the following sub-layers:

- (a) a sub-layer on unauthorised border crossings, including information available to the national coordination centre on incidents relating to a risk to the lives of migrants;
- (b) a sub-layer on cross-border crime;
- (c) a sub-layer on crisis situations;

(d) a sub-layer on other events, which contains information on unidentified and suspect vehicles, vessels and other craft and persons present at, along or in the proximity of, the external borders of the Member State concerned, as well as any other event which may have a significant impact on the control of the external borders.

The national coordination centre shall attribute a single indicative impact level, ranging from 'low' and 'medium' to 'high', to each incident in the events layer of the national situational picture. All incidents shall be shared with Frontex.

The operational layer of NSP shall consist of the following sub-layers:

(a) a sub-layer on own assets, including military assets assisting a law enforcement mission, and operational areas, which contains information on the position, status and type of own assets and on the authorities involved. With regard to military assets assisting a law enforcement mission, the national coordination centre may decide, at the request of the national authority responsible for such assets, to restrict access to such information on a need-to-know basis;

(b) a sub-layer on environmental information, which contains or gives access to information on terrain and weather conditions at the external borders of the Member State concerned.

The information on own assets in the operational layer shall be classified as RESTREINT UE/EU RESTRICTED.

The analysis layer of NSP shall consist of the following sub-layers:

(a) an information sub-layer, which contains key developments and indicators which are relevant for the purposes of this Regulation;

(b) an analytical sub-layer, which includes analytical reports, risk rating trends, regional monitors and briefing notes which are relevant for the purposes of this Regulation;

(c) an intelligence sub-layer, which contains analysed information which is relevant for the purposes of this Regulation and, in particular, for the attribution of the impact levels to the external border sections;

(d) an imagery and geo-data sub-layer, which includes reference imagery, background maps, validation of analysed information and change analysis (Earth observation imagery), as well as change detection, geo-referenced data and external border permeability maps.

The information contained in the analysis layer and on environmental information in the operational layer of the national situational picture may be based on the information provided in the European situational picture and in the common pre-frontier intelligence picture.

The national coordination centres of neighbouring Member States shall share with each other, directly and in near-real-time, the situational picture of neighbouring external border sections relating to:

(a) incidents and other significant events contained in the events layer;

(b) tactical risk analysis reports as contained in the analysis layer.

The national coordination centres of neighbouring Member States may share with each other, directly and in near-real-time, the situational picture of neighbouring external border sections

relating to the positions, status and type of own assets operating in the neighbouring external border sections as contained in the operational layer.

3.4 Communication Network

According to Article 7, Frontex shall establish and maintain a communication network in order to provide communication and analytical tools and allow for the exchange of non-classified sensitive and classified information in a secure manner and in near-real-time with, and among the NCCs. The network shall be operational twenty four hours a day and seven days a week and shall allow for:

- (a) bilateral and multilateral information exchange in near-real-time;
- (b) audio and video conferencing;
- (c) secure handling, storing, transmission and processing of non-classified sensitive information;
- (d) secure handling, storing, transmission and processing of EU classified information up to the level of RESTREINTUE/EU RESTRICTED or equivalent national classification levels, ensuring that classified information is handled, stored, transmitted and processed in a separate and duly accredited part of the communication network.

Frontex shall provide technical support and ensure that the communication network is interoperable with any other relevant communication and information system managed by Frontex. Furthermore, Frontex shall exchange, process and store non-classified sensitive and classified information in the communication network in accordance with Article 11d of Regulation (EC) No 2007/2004. NCCs shall exchange, process and store non-classified sensitive and classified information in the communication network in compliance with rules and standards which are equivalent to those set out in the Rules of Procedure of the Commission. Member States' authorities, agencies and other bodies using the communication network shall ensure that equivalent security rules and standards as those applied by Frontex are complied with for the handling of classified information.

3.5 European Situational Picture (ESP)

Common characteristics for European Situational Picture (ESP) has been regulated in Article 10. Frontex shall establish and maintain ESP in order to provide the NCCs with effective, accurate and timely information and analysis.

The European situational picture shall be composed of information collected from the following sources:

- (a) national situational pictures, to the extent required by this Article;
- (b) Frontex;
- (c) the Commission, providing strategic information on border control, including shortcomings in the carrying-out of external border control;
- (d) Union delegations and offices;
- (e) other relevant Union bodies, offices and agencies and international organisations as referred to in Article 18;

(f) other sources.

The events layer of ESP shall include information relating to:

- (a) incidents and other events contained in the events layer of the national situational picture;
- (b) incidents and other events contained in the common pre- frontier intelligence picture;
- (c) incidents in the operational area of a joint operation, pilot project or rapid intervention coordinated by Frontex.

In the European situational picture, Frontex shall take into account the impact level that was assigned to a specific incident in the national situational picture by the NCC.

The operational layer of ESP shall consist of the following sub-layers:

- (a) a sub-layer on own assets, which contains information on the position, time, status and type of assets participating in Frontex joint operations, pilot projects and rapid interventions or at the disposal of Frontex, and the deployment plan, including the area of operation, patrol schedules and communication codes;
- (b) a sub-layer on operations, which contains information on the joint operations, pilot projects and rapid interventions coordinated by Frontex, including the mission statement, location, status, duration, information on the Member States and other actors involved, daily and weekly situational reports, statistical data and information packages for the media;
- (c) a sub-layer on environmental information, which includes information on terrain and weather conditions at the external borders.

The information on own assets in the operational layer of ESP shall be classified as RESTREINT UE/EU RESTRICTED.

The analysis layer of ESP shall be structured in the same manner as that of the national situational picture set out in Article 9(7).

3.6 Common Pre-frontier Intelligence Picture (CPIP)

According to Article 11 Frontex shall establish and maintain a common pre-frontier intelligence picture (CPIP) in order to provide the NCCs with effective, accurate and timely information and analysis on the pre-frontier area.

The CPIP shall be composed of information collected from the following sources:

- (a) national coordination centres, including information and reports received from Member States' liaison officers via the competent national authorities;
- (b) Union delegations and offices;
- (c) Frontex, including information and reports provided by its liaison officers;
- (d) other relevant Union bodies, offices and agencies and international organisations as referred to in Article 18;
- (e) authorities of third countries, on the basis of bilateral or multilateral agreements and regional networks as referred to in Article 20, via the national coordination centres;

(f) other sources.

The CPIP may contain information which is relevant for air border surveillance and checks at external border crossing points. The events, operational and analysis layers of CPIP shall be structured in the same manner as those of the European situational picture set out in Article 10.

Frontex shall assign a single indicative impact level to each incident in the events layer of the common pre-frontier intelligence picture. Frontex shall inform the national coordination centres of any incident in the pre-frontier area.

3.7 Common application of surveillance tools

According to Article 12 Frontex shall coordinate the common application of surveillance tools in order to supply the NCCs and itself with surveillance information on the external borders and on the pre-frontier area on a regular, reliable and cost-efficient basis.

Frontex shall provide NCC, at its request, with information on the external borders of the requesting Member State and on the pre-frontier area which may be derived from:

- (a) selective monitoring of designated third-country ports and coasts which have been identified through risk analysis and information as being embarkation or transit points for vessels or other craft used for illegal immigration or cross-border crime;
- (b) tracking of vessels or other craft over high seas which are suspected of, or have been identified as, being used for illegal immigration or cross-border crime;
- (c) monitoring of designated areas in the maritime domain in order to detect, identify and track vessels and other craft being used for, or suspected of being used for, illegal immigration or cross-border crime;
- (d) environmental assessment of designated areas in the maritime domain and at the external land border in order to optimise monitoring and patrolling activities;
- (e) selective monitoring of designated pre-frontier areas at the external borders which have been identified through risk analysis and information as being potential departure or transit areas for illegal immigration or cross-border crime.

Frontex shall provide the information by combining and analysing data which may be collected from the following systems, sensors and platforms:

- (a) ship reporting systems in accordance with their respective legal bases;
- (b) satellite imagery;
- (c) sensors mounted on any vehicle, vessel or other craft.

4. The current situation of EUROSUR

EUROSUR system has been developed since 2008. EUROSUR framework has been imposed on Regulation (EU) No 1052/2013 of the European Parliament and the Council of 22 October 2013 establishing the European Border Surveillance System (EUROSUR). All 30 Schengen states are now connected to EUROSUR (Frontex 2015). This report describes the current state of the EUROSUR system. EUROSUR Roadmap is discussed in Deliverable 3.7

4.1 Frontex report “The functioning of EUROSUR”

Frontex released a report on functioning of EUROSUR⁶ in December 2015 two years after the EUROSUR Regulation entered into force and the EUROSUR framework became ‘up and running’. Report analyzed only those components of EUROSUR for which Frontex is responsible. Besides short description of Frontex-run EUROSUR components (communication network, European situational picture, pre-frontier intelligence picture, application of surveillance tools) report presented selected figures and facts on operation of the system ‘on the ground’ indicating its success. The implementation of EUROSUR in the Member States (National Coordination Centres, National Situational Pictures) will be covered by the report of the Commission scheduled for December 2016.

4.1.1 EUROSUR network

Over the period 2008 to 2011, the Member States, Frontex and the European Commission have tested the project and established the main technical component, the EUROSUR network. All the 30 NCCs had been connected to the EUROSUR Communication Network on time and within the estimated financial framework. The six initial NCCs and Frontex were connected 2011, additional 12 NCCs were connected in 2012 and the last 12 MSs in 2014. The further provision of maintenance and support to the network (including installing nodes, hardening of network, adding functionalities, potential upgrading of the network security to a higher security level, providing training and materials as well as support for technical users) is mainly of technical nature and is achieved by Frontex within the regular ICT business process.

Personal data within Joint Operations was not exchanged using the EUROSUR communication network.

As the EUROSUR Communication Network is not accredited yet for exchange EU classified information up to RETREINT UE/EU RESTRICTED, it is not possible to test all EUROSUR Operational Layers functionalities.

4.1.2 European Situational Picture (ESP) and Common Pre-Frontier Intelligence Picture (CPIP)

Articles 10 and 11 defines the conditions for implementing ESP and CPIP. One of the main goals achieved during the development and maintenance of the system was to ensure the proper feeding of different kinds of information under one single umbrella by both Frontex and Member States. This is done in three layers (events, operational, analysis). This section describes shortly

⁶ Frontex report to the European parliament and the Council based on Art 22(2) of Regulation (EU) No 1052/2013 - The functioning of EUROSUR, Warsaw, 1 December 2015.

development work in operational layer and analysis layer. The information on the events layer as a statistical summary can be found in chapter 4.1.4.

From the very beginning of the EUROSUR implementation, emphasis was put on the integration between the existing JORA incident reporting and the EUROSUR network application. Frontex ensured early that there is no duplication of incident reporting during Frontex coordinated Joint Operations (JO), which contributed significantly to the compilation of the a reliable and coherent European Situational Picture. During JOs Frontex insert incidents and other data in the ESP and CPIP regarding illegal migration and cross-border crime. Member State's National Coordination Centres are responsible to insert incidents taking place outside the operational area of Joint Operations.

The elements of the operational layer were tested within selected Joint Operations. For example, during the implementation of the JO Idalo 2015, operational area was drawn and shared with all the Member States (Host and Home Member States) participating in the operation. Operational lay consist of several functionalities/modules. The core idea of Frontex Compatible Operational Image (FCOI) is to provide secured transmission of the operational data from the technical equipment deployed in the JO's to the Coordination Centres in Host MS and Frontex in real or close real time. Position of assets is displayed via the JORA Visualisation Module.

Operational layer is supported by Frontex Positioning System (FPS). It is a single, real-time automated system for tracking assets deployed in Frontex coordinated JO by displaying the position of the assets and calculating running costs of assets, thus providing automated procedures for assimilating and reporting financial data within JO. For this purpose assets deployed in JO will be equipped with a portable GPS/satellite/GSM transceiver to be installed on board of the asset. Information on assets (time, position, speed, course, height, type) sent via portable equipment is received in ICC/NCC or other locations defined in the operational plan and is displayed on screen of the portable operational module in close to real time, thus increasing the awareness on resources and providing responsible officials with timely, accurate and complete information on which they can base decisions.

The EUROSUR Analysis Layer was established in order to support a risk and intelligence driven approach for border management. Since its activation it has been constantly evolving based on the Member States and Frontex' long-term analytical requirements. Given the importance of risk analysis activities, the EUROSUR risk analysis community established a mechanism to engage its stakeholders. This was accomplished in 2012 through the establishment of the EUROSUR Analysis Layer User Group (ALUG). This working level group has since served to organize the cooperation between the analytical entities and/or relevant national department representing that role in the NCCs and Frontex. One of the main contributions of this community has been the facilitation of discussion on risk analysis by offering a platform for sharing experiences and exchanging views and methodological approaches. Regular EUROSUR ALUG meetings and tailored workshops have been essential for the work conducted under its framework.

Since 2012 RAU has been populating and maintaining the Analysis Layer. In all 1073 Analytical reports have been shared with all the NCCs since the establishment of EUROSUR. MSs have so far shared 12 analytical reports. Based on the work conducted within the ALUG, in 2015 the Analysis Layer was redefined to better serve the NCCs and Frontex analytical requirements.

In 2013 within the ALUG Frontex coordinated and supported /MSs/NCCs in the determination of almost 180 EUROSUR Border Sections.

4.1.3 Common application of surveillance tools

Based on Article 12 Frontex coordinate the common application of surveillance tools. For that purpose Frontex has launched product development with other European agencies (e.g. European Maritime Safety Frontex (EMSA), the EU Satellite Centre (EU SAT CEN)) to develop EUROSUR Fusion Services (EFS) which effectively enhances situational awareness of the EU Member States. The EUROSUR Fusion Services include automated vessel tracking and detection capabilities, software functionalities allowing complex calculations for detecting anomalies and predicting vessel positions, as well as precise weather and oceanographic forecasts. Fusion Services use optical and radar satellite technology to locate vessels suspected to be engaged in people smuggling that often puts the lives of migrants in danger. At the moment EFS are comprising a set of 13 services offered to MS and Schengen Associated Countries, enhancing their situational awareness at the external borders (Frontex 2015).

In the maritime domain users are provided with a set of vessel information services. *Vessel Detection Service* detects objects at sea thanks to an advanced satellite radar technology. *Vessel Monitoring and Tracking Service* provides a constantly updated database on vessels and their positions, whereas *Tracking Vessels of Interest Service* delivers daily situational reports on selected suspicious vessels. Given the position and past track of such vessel, *Anomaly Detection Service* can point to anomalous behavior of objects at sea and alert the user. Based on the position of a vessel of interest, taking into account its type and meteorological conditions, the *Maritime Simulation Module Service* can provide a prediction of a vessel's position in a given time frame. All these services in the maritime domain contribute to providing daily support especially in the context of SAR for saving lives at sea.

EFS delivers also a range of earth observation services. *Satellite Imagery Service* provides satellite images of areas of interest to Member States. *Coastal Monitoring Service*, *Pre-Frontier Monitoring Service*, and *Reference Imagery / Mapping Service* provide an in-depth analysis of such imagery. Furthermore, *Visual Data Discovery Service* provides Member States with sets of detailed statistical information, while *Meteo Service* is a source of an advanced meteorological forecasts.

Since December 2013, Frontex has provided the Environmental Layer as an integral part of the EUROSUR Fusion Services in compliance with Article 10 (European Situational Picture) and Article 12 (Common application of surveillance tools) of the EUROSUR Regulation. The layer contains information about atmospheric as well as oceanographic conditions and forecasts. The information is used for different purposes, such as operational activities and satellite acquisition planning. The information contained in the Environmental layer is also used for supporting prediction about potential disembarkation areas, and supporting in the education of Search and Rescue (SAR) operations. According to Frontex report, additional content will be provided in the Environmental layer and in addition, historical data for risk analysis and an alerting feature for email & SMS notification will be included into the services.

Besides close-to-real-time services, Frontex also makes available a wide range of analytical products tailored for operational use within EUROSUR.

4.1.4 Reaction capability

Reaction capability means the ability to perform actions aimed at countering illegal cross-border activities at, along, or in the proximity of the external borders, including the means and time to react appropriately. At the same time it is one of the key factors contributing to protecting and saving migrants' lives. National authorities with responsibility for external border surveillance need to be able to re-allocate resources, such as staff, equipment and assets to quickly react to any

changes at sea and land external borders and, if applicable, at border crossing points. (EUROSUR Handbook 2015, 29).⁷

According to Article 14 of EUROSUR Regulation each Member State shall divide its external land and sea borders into border sections, and notify them to Frontex. In each section impact level shall be defined based on a three-fold classification - low, medium or high - which refer to the security of a given border section assessed against identified risk levels for illegal border crossing or cross-border crime. Measures to be taken to reduce the risks remain the responsibility of individual Member States, although in the case of “high impact level” border areas they may request operational assistance from Frontex in the form of prioritised spatial services, a joint operation or rapid intervention.

Apart from one exception (Greece) impact levels for all border sections were agreed. Since May 2014 the impact level assessments have been visualized in EUROSUR and updated in monthly basis. The process of impact level of attribution has become a major component of the work of operational analysts on the basis of a predefined methodology. The update of impact level attribution takes place on a monthly basis for all sea and land border sections and is to be uploaded in EUROSUR, where Member States have direct access and can evaluate the findings.

The attribution of the level of impact has to be understood as attribution of the level of risk, in line with Common Integrated Risk Analysis Model (CIRAM) methodology. It is important to note that data introduced to EUROSUR is lacking structural consistency and so does not provide a solid basis for the assessment. Therefore, operational analysts use an all-source approach, using all types of data available at Frontex, such as JORA, FRAN, regional analytical networks and the findings and, in addition the analytical output of other Frontex analysts.

In the case of impact level change, a designated analyst is responsible for the communication with the National Contact Point in the Member State, following an established process that has been agreed with the Member State. So far in 2015 there have been only two occasions when the impact level of EUROSUR border section was requested to be changed; one in the case of Spain and one in the case of Croatia.

4.1.5 EUROSUR in figures

Since adoption of the Regulation EUROSUR framework has become a well-established tool for improving Member States awareness and increase their reaction capability at the external borders of the EU. From its launch and until 4 November 2015, the EUROSUR network application has recorded a total of 117.721 events, while 9.125 documents were stored in its repository. Also within this timeframe, a total of 68.105 incidents were inserted into to JORA (Joint Operations Reporting

⁷ ANNEX 1 to the COMMISSION RECOMMENDATION adopting the Practical Handbook for implementing and managing the European Border Surveillance System (EUROSUR Handbook). European Commission, 15.12.2015 C(2015) 9206 final.

Application) system, from a total of 37 Joint Operations. The incidents reported into JORA are being fed by Frontex into the EUROSUR network application.

EUROSUR Node	Crisis	Irregular migration ⁸	Related cross-border crime ⁹	Other ¹⁰	Total events
MS	50	41521	11011	321	52903
SACs	1	451	10	1	463
Frontex	72	52028	9700	2555	64355
Total	123	94000	20721	2877	117721

Table 2: Events inserted in EUROSUR network application either by MS, SAC or Frontex node and type

Table 2 illustrates a total amount and type of incidents from 18 Joint Operations uploaded in JORA, since the entering into force of the EUROSUR Regulation and until 4 November 2015.

Joint Operations	Irregular migration	Cross-border crime	Other
Coordination Points Land 2014-15	542	103	118
EPN Aeneas 2014	29	4	1
EPN Hera 2014-2015	24	6	8
EPN Hermes 2014	753	1	3
EPN Indalo 2014-2015	595	181	12
EPN Minerva 2014-2015	433	2093	457
EPN Triton 2014-2015	1057	4	7
EU COM Amber light 2015 Air	825	0	0
EUROSUR Croatia	11	2	0
Flexible Operational Activities (all) 2014-2015	9636	321	20
Flight tracking	126	0	0
Focal Points Air 2014-2015	1074	0	0
Focal Points Land 2014-2015	22600	6585	2706
Focal Points Sea 2014-2015	600	1424	45
Pegasus 2014-2015	312	0	0

⁸ JORA incident categories used in Frontex report are as follows. Under “Irregular migration”: Avoiding border control, Family/Group on same complete route, Group of Passengers arrival flight not identified, Group of Passengers on same complete route, Illegal border crossing, Migrants deterred, Overstay, Prevention of departure, Readmission, Refusal of entry, Single Passenger not in group, Third Country Action.

⁹ Under “cross-border crime”: Facilitation (smuggling of humans), Facilitation / document fraud, Hiding in transportation means / clandestine, Hit in database, Smuggling of goods, Stolen vehicles, Trafficking in human beings.

¹⁰ Under “Other”: Administrative, Asylum request, Illegal fishing, Migrants deterred, Other, Pollution.

Joint Operations	Irregular migration	Cross-border crime	Other
Poseidon Land 2014	527	70	3
Poseidon Sea 2014-2015	8172	936	4
REX 2014	8	0	0

Table 3: Incidents inserted in JORA since enter into force of the EUROSUR Regulation, and until 4 November 2015.

As the Tables 2 and 3 illustrate, the ‘intensity’ of Member States, Schengen Associated Countries and Frontex reporting to EUROSUR varies considerably. Frontex has been the most active node with more than 64.000 events. In terms of events “irregular migration” with 94.000 cases cover 80 % of all reported incidents followed by cross-border crime with 21.000 cases (18 %). It is worth mentioning that due to limited scope of EUROSUR Regulation for land and sea borders, Member States and Schengen Associate Countries have no obligation to report incidents at border control points and on air borders in EUROSUR application, which keeps the situational picture incomplete.

Besides statistical data, Frontex report on the functioning of EUROSUR presents examples on the ground. Selected cases illustrates how EUROSUR system has provided added-value in vessel apprehensions (contraband cigarettes and weapons) and migrant detection and rescue operations.

4.2 EUROSUR in light of research

Modern border control has been widely discussed in academia. Due to research economy and purpose of this document there is no need to discuss these common trends which all can be found in research papers focusing on EUROSUR. Anyway, this material is used (without citing it) to enrich the analysis of EUROSUR, especially in section 4.2.1 when illustrating mainly numerous negative ‘-zations’ in the field of border control. As a general observation one can argue that academics, like media and human rights organizations have been highly critical concerning the creation and implementation of EUROSUR.

Besides the policy goals of the programme, critics have focused on enhanced surveillance and collection of data. Operation of EUROSUR system in general, expected efficiency in achieving its objectives, and the costs have been criticized, too. In the subsections 4.2.1 - 4.2.6 discussion around EUROSUR will be presented. Grouping of the findings is based on the affinity diagram (AD) method used on the one hand, and the requirements to produce information on the practical dimension of EUROSUR, as well as its technical feasibility, on the other.

4.2.1 Policy implications

European integrated border management and especially the management of European maritime borders through maritime surveillance tools like EUROSUR has been heavily criticized in many fields of research (but not limited to) as sociology, geography, criminology, migration studies, mobility studies, border studies, critical security studies, surveillance studies, cultural anthropology, and governance as numerous emerging ‘-zations’ like:

- depolitization of border
- delegitimization of border
- externalization of border
- virtualization of border
- technologization of border

- automatization of border
- dehumanization of border
- criminalization of border
- militarization of border
- technocratization of border
- ecologization of border
- commoditization of border
- privatization of border

Countless observers have claimed how there is a ‘deficiency of governance’ (Lock 2010) and lack of political oversight in “European border project”. One of the main critics have been the technocratic process, the EUROSUR development well in advance the establishment of a legal basis for the system and thorough political discussion over its necessity, proportionality, as well as societal and ethical implications (Jiménez 2013). Furthermore, EUROSUR system has not been subject to a proper technological risk assessment (Hayes & Vermeulen 2012). Amid involvement of Europe’s defence industry and lack of political oversight, critics have lambasted the ‘technocratic process’ behind EUROSUR as well as the ‘blank cheque’ seemingly given for its development (Hayes & Vermeulen 2012). According to Jiménez (2013) European border management policies and practices are more influenced by ‘expertocracy’ and economic interests than being subject to a thorough political discussion opened to public security. Hence, border management efforts, instead of being just and humanitarian, have focused towards questions around the political economy of controls what may be termed as a ‘border ecology’ (Andersson 2016). According to Hayes & Vermeulen (2012) we have been witnessing convergence of business interests and the aims of political hardliners who view migration as a threat to the EU’s homeland security. Due to the economic interest groups are not necessarily (social) problem-oriented actors, the technological solution offered by industry may not necessarily be problem solving, but driven by the pure logic of maximizing benefits.

The reconciliation between the security and humanitarian narratives to legitimize reinforcing the surveillance of EU borders has been widely challenged within the scholarly literature. These accounts have shown that tightening border controls has pushed migrants to undertake other, often riskier routes, to circumvent these ever more advanced controls with the consequence of increased number of fatalities at sea (Pickering & Cochrane 2012; Baldaccini 2010; De Haas 2008; Webber 2006) revealing that ‘the practices of surveillance that are called upon to save lives are simultaneously putting the persons in question at risk’ (Jeandesboz 2011, 7). According to Jiménez (2013) it is, thus, tempting to assume that EUROSUR may intensify or at least not reverse this dreadful tendency. In fact, European border surveillance tools (e.g. EUROSUR, SIVE, *Mare Nostrum*) have acted as a pull-factors for irregular migration due to potential migrants were to embark more readily on their journey if they expect to be intercepted, or rather rescued, and transferred to mainland Europe.

Martin (2013, 3) have warned that the principle of non-refoulement and the right to claim asylum may not be guaranteed since “asylum law obligations do not apply to situations in contiguous zones or on the high seas”. Hence, EUROSUR fosters EU policies that undermine the rights to asylum and protection. In addition, Frontex has been criticized for its “push back” operations. EUROSUR is emblematic of a paradigm shift in the policing of the open seas. EUROSUR expands the territorial reach of maritime surveillance. Surveillance takes place along all EU coastal waters up to a range of 30 nautical miles as well as in “wide sea bands close to third countries” coastal waters, which again emphasizes the external dimension of the project (Rijpma & Vermeulen 2015, 458).

EUROSUR increases the possibilities for extraterritorial control since its ‘territorial reach’ into international waters and third states goes beyond EU member states’ jurisdiction. Furthermore, third countries, implicating them not in a mutually beneficial partnership, but rather as gatekeepers for the EU effectively moving border controls beyond the actual borderline. This has been criticized as externalization of the border control.

Externalization of the border has been linked with virtualization of border. Linking the concept of the virtual border to the idea of a maritime border made it possible to open up the idea of precise territorial borders in their spatial dimension and introduce geographical ambiguity. This makes possible to carry out the classical tasks of border protection and border control beyond the frontier. According to critics the underlying principle is that the EU’s ‘sea border’ extends to any country with which it shares an ocean, basically giving it the right to police the entire sea.

EUROSUR system is targeted to combat illegal migration and cross border crime while protecting and saving lives of migrants. According to researchers asylum seekers are connected to (1) illegality and stigmatized as individuals who try to circumvent the law by entering the Union undetected. EU surveillance systems, on an internal as well as external level, inherit and operate a coupling of asylum seekers with illegality and threat. Illegal person (transgressing the borders of the nation-state) who has been criminalized in advance of the fact of having actually committed any crime. Hence, EUROSUR has been described as criminalization of the border.

Current border control has been described in research literature as militarization of border. Militarization have been used in many meanings and studied in different contexts. In general, term ‘militarization’ is used to describe the use of military type organizations, equipment and tactics as well as hardening of policies, laws and discourses, ‘militarizing the societal’, to speak. Regarding EUROSUR system many researchers (Pugliese 2013; Sombetzki & Quicker 2016) have noticed a militarised lexicon in EUROSUR Regulation (1052/2013): ‘platforms’, ‘situational awareness’, ‘situational crisis’, ‘reaction capability’ and the ‘combating [of] illegal migration’ According to critics, the wording of EUROSUR Regulation has more in common with defence strategies than with border monitoring. Every migrant that attempts to cross borders, which includes asylum seekers, is clearly depicted here as an intruding, threatening and disruptive element which merits increased surveillance to prevent an unauthorized breach of the EU’s borders. These terms all work to represent the border in terms of a ‘theatre of war’ (Pugliese 2013).

EUROSUR have been criticized of technologization of border, too. Bellanova and Duez (2016) have argued how the very general concept of EUROSUR translates de facto political goals—migration flows control, internal security and humanitarian intervention—into measurable performances which would in turn orientate the actions of socio-technical assemblages. Tendency to seek agreement over initiatives that are deemed ‘technical’ in the face of persistent struggles in domains considered by Member States’ governments as sovereign matters. Labeling a question as ‘technical’ is often a subterfuge of the political; an attempt to depoliticize sensitive matters (Brouwer 2008; Jeandesboz 2011).

The other aspect of technologization is the vast array of sensors, systems and information technology (IT) used in European border control. According to Pugliese (2013) the various scopic technologies and their integrated databases collectively work to constitute networked systems of virtual border control. EUROSUR, working with Frontex, will effectively integrate satellite imagery ‘from GMES (Global Monitoring for Environment and Security)’, geodata, border cartographies, ‘Forward Looking Infrared (FLIR)’ cameras, ‘Night Vision Goggles (NVG)’, ‘unmanned static and mobile sensors, fixed seismic sensors, and fixed and mobile cameras and radars’ in order to identify and track events and human beings create a regime of statist visibility. According to Pugliese (2013)

“The exhaustive array of visualising technologies that penetrate darkness, that detect body heat and movement, that track figures from the sky and so on all bring into sharp focus the configuration of a globally encompassing regime of statist visibility that dreams of leaving no corner of its territory and its extra-territorial spaces unobserved.” (ibid. 582).

Technologization and virtualization of border signifies a ‘dehumanizing’ shift in political thought how migration and people in move are considered. Pugliese (2013, 588) claims convincingly that “*there is no longer a subject.*” Furthermore, what the new preventative policies primarily address is no longer individuals but factors liable to produce risk.

Working together with the objectifying effects of screen technologies, statist regime of visibility and risk probabilities works to render the material *abstract* (the human subject rendered into a digital node within interoperational networks), the individual generic (the figure in the landscape as mere stereotyped index of risk factors) and the subject *object* (the individual subject desubjectified as target object). These developments transform not only the way in which the European border is managed, but also the nature the border itself. (Pugliese 2013.)

Technocratization have been defined as a process, where decisions concerning security are taking out of the public debate and rendered to the expertise of those with the technical knowledge and skills to define it. In the same way Edkins (1999, 11) stresses, how technocratization ‘works...by producing...a view of knowledge as separable from the political (or power)’. Jiménez (2013) has described this tendency as ‘expertocracy’ to highlight the leverage of expert knowledge on the design and technological configuration of EUROSUR. According to Jiménez (2013) technocratization becomes apparent tracing the decision-making process behind EUROSUR. Technocratic discursive strategy and the overreliance on technology have the inherent danger that border control problems as well as their solutions become increasingly ‘framed in technical operability instead of normative terms’ (Sitkin 2012). Another particular effect of technocratization is the ‘objectification’ of the migrant. As Feldman (2012, 116) points out, the BORTEC study largely replaces the words “immigrant” or “migrant” with “targets” of surveillance; whereby Frontex seemingly constructs the ‘objectified migrant for analytic purposes versus the humanitarian subject for rhetorical purposes’. (Jiménez 2013.)

Finally, EUROSUR has been discussed in academic literature in the context of privatization and commoditization of security. Borders and border control are not any more privilege of state actors but scene of assemblage of various security providers. The participation of private actors (industry) is not a novelty, but one of the most common features of the setup of digital borders (both as providers of technologies and information, and enactors of surveillance and control). However, their role is often left on the margin of debates, as ‘incidental’ actors rather than main characters. (Bellanova & Duez 2016, 37.) Apart from this invisibility of the private actors, it is worth to note that the EUROSUR project explicitly foresees a key role for EU-founded research projects, which formally become an important actor of the setting (European Commission 2009, 7).

4.2.2 Fundamental and human rights

Along with questioning European border policy one part of the critics have focused on issues concerning fundamental and human rights. The European Commission (2011b)¹¹ did not issue a fundamental rights impact assessment, but in two paragraphs in the explanatory memorandum

¹¹ European Commission (2011). Proposal for a Regulation of the European Parliament and of the Council establishing the European Border Surveillance System (EUROSUR), COM(2011) 873 final., p. 3.

argued that EUROSUR's provisions would be “fully compatible with fundamental rights”. This reassurance has been questioned by academia. Especially the following issues have been discussed in academic literature:

- enhanced collection of data
- lack of data protection safeguards
- collecting and processing of personal data
- sharing data with third countries
- restriction of the right to asylum
- violation of the principle of non-refoulement

Many researchers (Hayes & Vermeulen 2012; Jiménez 2013; Sombetzki & Quicker 2016) are concerned about the enhanced collection of data. According to them widened accessibility of information for a greater number of agents creates a logic of exclusion. It render different strands of information intelligible by evaluating their relevance and impact and by distributing them in a targeted way. Furthermore, when they pool data from different sources, whose primary goal is not to monitor the so-called irregular immigration or cross-border routes, the making sense of the situational pictures is, de facto, a re-enactment of these elements (as in the case of ship reporting systems). In other words, the ensemble formed by Frontex analysts, software and methodologies of risk assessment, are applying a new rationale to elements that were developed within a different discourse.

Enhanced information exchange change also the balance of power and nature of border control. The exchange of information regarding border-related incidents at the EU's common borders and the collection and representation of this information in a situational picture not only make proactive border management possible but make a visual suggestion that some course of action should be undertaken even by those who are not yet (geographically) responsible. Hayes & Vermeulen (2012) have described this common feature of modern law enforcement as “data juggernaut”.

EUROSUR information can be used in international law enforcement missions. EUROSUR Regulation (EU) No 1052/2013 have been criticized due to lack of adequate data protection safeguards. Even though EUROSUR will not gather a massive amount of personal or biometric data, or result in the establishment of a centralized database that stores such information, personal data could be processed in a number of different “layers” of the situational pictures. In addition, different tools for EUROSUR system like unmanned aerial vehicles (UAV) have been considered as risks for personal data because of their potential hacking (Sombetzki & Quicker 2016). As a consequence there has been critical voices for establishment of data protection safeguards (e.g. strictly defined conditions for personal data exchange, establishment of supervision system, and introduction of logbooks).

EUROSUR is a system of systems collecting and processing large amounts of data. Basically EUROSUR will mainly process data on “incidents and depersonalised objects” and was not “intended as a system to regulate the collection, storage or cross-border exchange of personal data”. Nonetheless, it would allow for the exchange of personal data using EUROSUR's communication network in accordance with applicable European data protection law. EUROSUR will only process personal data on an “exceptional” basis, with the result that minimal attention is being paid to privacy and data protection issues. The proposal did not contain a specific provision on the processing of personal data.

Hence, it is not surprising why EUROSUR also raises particular privacy and data protection concerns – especially regarding the foreseen use of drones and other means of aerial surveillance, which are currently not properly addressed in the current legislative proposal. However, all National Coordination Centres are allowed to process personal data, and this information can be included in their national situational picture. The description of the different “layers” of the national situation picture further suggests that personal data could be included in a range of scenarios. The required reporting on incidents concerning the illegal border crossings of migrants, trafficking in human beings, or smuggling of drugs in the “events layer” could for instance include personal data on both criminals and victims. When a suspicious vessel is being tracked, data about the ownership of the vessel, its operators, passengers, crew, agents, etc., is highly likely to be processed. (Hayes & Vermeulen 2012.)

Furthermore, as Hayes & Vermeulen (2012) reason, the analysis layer of the national situational picture can consist of an intelligence picture sub-layer, which can contain undefined “migrant profiles” and an “imagery and geo-data sub-layer, which shall contain reference imagery, background maps, intelligence validation assessments, change analysis (earth observation imagery) as well as change detection, georeferenced data and border permeability maps.” It is as yet unclear whether such images could include images of identifiable persons, but this seems almost certain, they argue.

One alarming issue among academics has been sharing data with third countries. Potential sharing of personal data with third states and agencies might result in the future in violations of the protection of personal data. It is thus questionable if privacy can be entirely guaranteed. So far, there is clearly a lack of safeguarding measures that effectively prevent the dissemination of collected data to third parties (Hayes & Vermeulen 2012; Sombetzki & Quicker 2016). Parliament’s resolution expressed several concerns as regards the protection of data and fundamental rights in particular when cooperating with third countries, echoing a critical study that had been commissioned by the LIBE Committee (Jeandesboz 2008).

As earlier discussed EUROSUR has been criticized because EUROSUR is the de facto restriction of the right to asylum. The restriction of the right to asylum constitutes a form of structural violence as well, as the collective expulsion of migrants lead to an exposition to the risks associated with human rights violations, discrimination, war and poverty in third-countries.

Finally, EUROSUR system has been criticized as violation of the principle of non-refoulement. Irregular migrants becomes a target of ‘preventative’ intervention, and is thereby precluded from travelling across the very same spaces that the travelers of the global North is privileged to traverse. This preventative intervention of refugees and irregular migrants may violate the principle of non-refoulement and the ‘regime of protection provided by the border of the European Community’ (Pugliese 2013). According to Bigo (2006, 46) EUROSUR can be understood as “ban-opticon” which, unlike Foucault’s neutral panopticon, adds a negative, exclusionary bias to its surveillance.

4.2.3 Expanded role of Frontex and new surveillance practices

EUROSUR widens Frontex powers as a coordinator and provider of European border surveillance. Integration of EU border management enables both a more flexible approach to the geography of border controls and an expansion of the competencies of border services. But as Ellebrecht (2013, 234) puts it, “merely criticizing EUROSUR as a surveillance behemoth overlooks the changes that an ‘intelligent information system’ brings at the inter-organizational and administrative levels”. It can be assumed that the introduction of such a technologically advanced and proactive approach will lead to a shift in the everyday working practices of border protection.

These observations are in line with what has been earlier discussed as technocratization of border and increased ‘expertocracy’ of European border surveillance (Jiménez 2013).

EUROSUR has the potential to establish a digital record of individuals, which would be certainly of interest for law enforcing agencies. According to Sombetzki and Quicker (2016) the most striking effect of the interoperability of EUROSUR with other surveillance systems such as SIS/II or VIS is the abuse of EUROSUR for law enforcement. This is partly due to lack of accountability. A lack of democratic oversight and safeguarding measures against its abuse raises legitimate concerns that the interoperability of EUROSUR with other surveillance networks may in fact result in Bigo's (2006) "banopticon".

It has been contested whether EUROSUR help save lives. EUROSUR is mainly *border surveillance* framework (Article 4). EUROSUR is targeted combatting illegal immigration and cross-border crime while contributing saving the lives of migrants. Nonetheless, “saving lives of persons found in distress at sea is always one of main priorities at Frontex’ Joint Operations (JO’s)”. Frontex (2015) report depicts some efforts made by Frontex to better manage SAR operations. All operational Plans (OPLANS) of JO’s implemented in 2014 and 2015 have included very clear provisions as regards MS obligations for respecting fundamental human rights during JO’s in line with Regulation 656/2014. All participants were briefed before implementation of Jos on aspects related to the application of fundamental human rights in practice during Jos. Furthermore in accordance with Article 4(8) of the Regulation, Frontex has developed a project to implement the new obligatory training on search and rescue. The pilot started as of March 2015.

One of the main criticisms of the EUROSUR has been secrecy and lacking transparency of the project. Generally it has been argued that private sector or security agencies commissioned to carry out the assessments on this additional border surveillance instrument have little interest in a ‘neutral evaluation’ of its necessity, proportionality or effectiveness. Their biggest worry has been associated with the promotion of their business opportunities and capitalizing (in)security.

4.2.4 Efficiency

By using affinity diagram (AD) method for qualitative analysis of research data effectiveness and efficiency were highlighted in many research papers. For clarification, effectiveness is about doing or using the right things — things that yield positive results. Efficiency is simply about doing things right — i.e., completing a task cheaper or faster. Effectiveness is only goal orientated whereas efficiency (along with its goal orientation) is effort, process and time orientated, too. Due to efficiency is wider paradigm to evaluate performance, it is used for this analysis. The following issues were raised in research data questioning the functioning and efficiency of EUROSUR:

- feasibility of multi-purpose system
- necessity and proportionality
- rivalry and tensions between authorities and member states
- difficult and piecemeal implementation
- rudimentary English of law enforcement
- resource-heavy and labor-intensive system
- running and implementation costs
- lack of real-time information
- limitations and practices of data exchange
- missing detection capabilities for small vessels
- negative side-effects

There has been technical and political debates concerning the feasibility of the multi-purpose system. Not every EU member state takes the view that EUROSUR should be used as a multi-purpose system, i.e. both for detecting unauthorized immigrants, preventing cross-border crime, and carrying out border patrols, and in the co-ordination of maritime rescue operations. In other words, EUROSUR has failed to demonstrate the necessity of the planned systems in terms of effectively controlling immigration, significantly enhancing the security of EU citizens, and facilitating travels of third-country nationals. In the absence of such justifications, the proportionality of EUROSUR, EES, and RTP is strongly open to question.

In addition, a larger factor hampering EUROSUR's efficacy was its piecemeal imposition, or how it unevenly overlapped with existing systems (Andersson 2016). Hayes & Vermeulen (2012) are concerned that the sheer scope of the planned system is a potential recipe for technical failures and cost overruns. EUROSUR have been described as a resource-heavy and labour-intensive system. Also, little attention is dedicated to the very articulation of the controlling elements, and their difficult implementation (Bigo 2014; Leese & Koenigseder 2015). According to most critical voices some member states fear that situational awareness will also reveal situational failure. According to Ellebrecht (2013) under these circumstances it is unlikely that the EUROSUR network will unfold its potential as a multipurpose system, even if this would be technically possible.

In addition, EUROSUR have created new political battles along new fronts (Carrera & den Hertog 2015). According to Andersson (2016) it added tensions among security forces, among member-states, and even among EUROSUR officers themselves, who held different ideas of the future functionalities of the system. EUROSUR was clearly a Frontex rather than a local priority. Rudimentary English of border guards is also mentioned as a barrier to an efficient implementation of EUROSUR.

Besides general criticism, almost all functionalities of EUROSUR have been criticized. Search and rescue (SAR) operations have been questioned due to EU member states do not share a generally accepted definition of maritime distress (Ellebrecht 2013). To the contrary, they have been fiercely opposing the inclusion of rules on search and rescue. Admittedly, there is no explicit legal basis on search and rescue in the Treaties.

How about situational awareness and reaction capability? EUROSUR is supposed to increase situational awareness of border authorities in Europe. Improved situational awareness should contribute to a more frequent and earlier detection of vessels in distress triggering Member States responsibilities for search and rescue at sea under public international law. In practice there are many challenges to do so. Some surveillance tools such as satellites do not provide continuous real-time information, and so are of little use in time-sensitive interceptions (Andersson 2016, 33). Furthermore, the operational layer, which provides the most up-to-date information, where applicable, is so far only accessible by management and not staff working on the ground.

Data protection Regulation may also hamper efficient implementation of EUROSUR. Only some 'raw data' was sent on to Frontex, with the rest not shared owing to national data protection limits. The dilemma is simple: how to deal with the imperative to keep, rather than share, sensitive border information since such information proves the reason for each security force's existence and role at the borders? Nobody wants to give up anything', one EUROSUR officer said at Frontex headquarters. 'If I give up the information', the border agencies reasoned, 'I will give up responsibility and my funding will be diminished.' (Andersson 2016.)

Efficiency of EUROSUR may also be endangered due to lack of detection capabilities of small and unseaworthy vessels. FRONTEX Director a.i. Gil-Arias has admitted that EUROSUR lacked the technological capacity to detect small boats carrying migrants and as such did not contribute to saving lives at sea (Nielsen 2014). It is relevant to note that RANGER project will improve vessel detection, recognition and identification capacities far beyond existing radars in terms of target size and distance.

Efficiency of EUROSUR has been questioned due to the alleged side effects, too. EUROSUR has been described as disproportionate ‘tool’ and socially ineffective solution that endangers preventing access to the EU territory. It was creating more risky migrant strategies, as the ‘pre-frontier’ of controls and pushed back operations were performed. It raises serious questions as to what can be expected from European member states with regards their obligations to the principle of non-refoulement, appropriate asylum application procedures and effective remedy.

The experience in the first years of its operation have proven wrong the assumption that EUROSUR can guarantee a fully controlled and patrolled border. Moreover, it should be kept in mind that if better surveillance of some stretches of the external borders is indeed achieved, this in turn will have inevitable displacement effects, potentially opening up new and more dangerous routes (Spijkerboer 2007). In fact, increased controls at the Greek–Turkish border have already increased pressure on the Bulgarian border and led to casualties in the Black Sea.

Finally, EUROSUR project has been criticized due to impartial scrutiny or review. Many researchers have questioned the prospects of EUROSUR achieving its key operational objective (continuous surveillance of the wide areas of open seas in order to detect and track small vessels from the point they depart the territorial waters of a third state). As the BORTEC study noted, “although it is theoretically possible to carry out the surveillance of all areas of the Open Sea 24/7, it would need an unbearable amount of resources without really knowing the outcome of such endeavour.” (BORTEC study, p. 98; cited in Hayes & Vermeulen 2012, 51).¹²

4.2.5 Costs

One of the criticisms has focused on the economic costs of EUROSUR project. Border control and surveillance has turned into a costlier-than expected venture for the EU budget (Jeandesboz 2008, 13). Whilst the initial budget of FRONTEX amounted to 19.2 million Euros in 2006, the figure had risen to 94 millions by 2013 (Frontex 2014, 30). In all 1.820 million have been allocated the External Borders Fund (EBF) over the period 2007–2013. The cost of implementing the EUROSUR system during the period 2011–2020 is estimated at €340 million. According to Heyes & Vermeulen (2012) EUROSUR could easily end up costing two or three times the Commission’s estimate, as much as €874 million. But, even worse than that, is that the legislative and financial framework for EUROSUR appears to give a blank cheque to FRONTEX and the European Commission to keep funding R&D from the EU budget until they find something that works.

The EUROSUR system relies on a host of new surveillance technologies and the interlinking of 30 different national surveillance systems and coordination centers, bilaterally and through

¹² A summary of the BORTEC Study is available in Annex 8 of the Impact Assessment (European Commission 2008, 85–89).

FRONTEX. Despite the high-tech claims, however, the planned EUROSUR system has not been subject to a proper technological risk assessment. The development of new technologies and the process of interlinking all national surveillance systems and coordination centres – bilaterally and through FRONTEX – is both extremely complex and extremely costly, yet the only people who have been asked if they think it will work are FRONTEX and the companies selling the hardware and software. The European Commission estimates that EUROSUR will cost €338 million, but its methods do not stand up to scrutiny. Based on recent expenditure from the EU External Borders Fund, the framework research programme, and indicative budgets for the planned Internal Security Fund (which will support the implementation of the EU's Internal Security Strategy from 2014–2020), it appears that EUROSUR could easily end up costing two or three times more: as much as €874 million. Practitioners (border guards) have also been concerned about the potential costs of the systems as it was gradually implemented (Andersson 2016).

The Commission utters concerns that only 505,000 migrants have been apprehended in 2010 and that this is only a small proportion of the estimate total population of *overstayers*, e.g. persons who reside in a country even though their legal permission to do so has expired. However, even if there are more overstayers, the number of "illegal" immigrants ranges between 1-5% of the total population of the EU. It should raise concern that this number is used to justify Union wide surveillance measures that register fingerprints and face scans of millions of migrants every year (Sombetski & Quicker 2016). According to Hayes & Vermeulen (2012) it is regrettable that the European Commission has not apparently considered perceived successes and failures with regard to comparable large-scale border control initiatives in the United States. Based on Briefing Paper "Proposed new EU Border Control Systems" from Civil Liberties, Justice and Home Affairs they argue how the US system (US VISIT and Secure Border Initiative/SBI-net) has led to 1300 refusals at the border, at the cost of \$1.5 billion. This amounts to a cost of over \$1 million per refused entrant – although it is possible that the US system has had other results as regards the objectives of immigration control.

5. Defining criteria for Benchmarking

This report will define the criteria for benchmarking the RANGER project against EUROSUR framework. These common requirements for benchmarking will be drafted based on EUROSUR Regulation (EU) No 1052/2013 and technical features of the EUROSUR system as described in above sections.

Without prejudice to further work within Task 2.3 (Gap Analysis) and Task 2.4 (System Requirements Elicitation and Functional Specifications and success criteria) common criteria for benchmarking in the areas of vessel detection, recognition, and identification, situational awareness and reaction capability will be identified and drafted to provide guidance for RANGER user and system requirements (D2.3 and D2.5).

5.1 Vessel Detection, Recognition, and Identification

From a technical point of view, maritime border surveillance is more challenging than land border surveillance. The maritime borders are a vast space, which is filled with a huge number of legitimate activities such as fishing, commercial shipping and pleasure boating. The fact that traffickers are currently using small wooden and glass-fibre boats for smuggling irregular migrants and illicit drugs poses a major challenge to law enforcement authorities because it is extremely difficult to detect, identify and track such small, non-metallic boats on the high seas.

Technical solutions have to be found to improve the situational awareness in the maritime domain and detect these small boats, such as the use of earth observation satellites and unmanned aerial vehicles (UAV) in combination with ship reporting systems. Use of small, unseaworthy boats is the main reason for the huge loss of lives of migrants at sea. Hence, increased situational awareness will also contribute to reaction capability helping to save lives at the external borders.

The monitoring of merchant vessels also represents a major challenge. The detection of abnormal behaviors could reveal illegal or suspicious activities (e.g. the case of "East Sea" in February 2001 when 910 irregular migrants embarked in France). For these reasons both EUROSUR and RANGER have to operate with a high level of availability.

Therefore RANGER aims to enhance EUROSUR in particular at improving the detection, identification and tracking of all sizes of boats, thereby supporting search and rescue (SAR) missions without prejudice to the functions and tasks which fall within the responsibility of the Maritime Rescue Coordination Centres.

Traditional surveillance methods including visual observation - the use of audible warnings such as foghorns, bridge-to-bridge Very High Frequency (VHF) radio communications - and radar (including the Automatic Radar Plotting Aid) have all improved over the years but still suffer from lack of accuracy and time delays due to limited detection range. Therefore it is important to exploit current and emerging technological advancements, and when combined with legacy systems, will lead to significant reduction of the loss of lives and better control of irregular migration while safeguarding internal security by preventing cross-border crime such as trafficking and smuggling.

RANGER project will improve the current EUROSUR system by developing and optimising the new Over-The-Horizon (OTH) Radar system and Photonics enhanced MIMO radar configuration/system (PE-MIMO). Diginext has already developed Stradivarius which is the last generation High Frequency Surface Wave (HFSW) Radar built on key patents that cover the areas of antenna array design and signal transmission encoding. The new OTH radar will cover a range

of 150 Nm and increase the state of the art radar performance in terms of resolution and detectable target speed by order of magnitude. It will even support different sea configurations (e.g. open seas, semi-enclosed seas with limited basin like the Aegean Sea).

More specifically, the new OTH radar will contribute to the detection, recognition and identification of vessels in the following way:

- higher detection ratio of actual targets: 99% comparing with AIS and using cooperative boats during pilots
- reduce the ratio of false positives up to 10⁻⁴
- increase the spatial accuracy of the target localisation with a range accuracy up to 100 meters and an azimuthal accuracy up to 0.2 degrees
- increased detection of small vessels with a height above the sea level of less than 5 meters
- a range resolution, which is the minimal distance between targets almost of the same speed in order the radar to be able to distinguish them, of less than 3 km
- refresh rate of 30/60 seconds.

The Photonics Enhanced MIMO (PE-MIMO) Radar would act as a complement technology to the OTH radar by bringing the following contributions:

- a ratio of false positives reduced twice compared to other radar systems
- target manoeuvring: detection and tracking of vessels which are rapidly changing the direction
- accurate detection of small vessels of length higher than 3 meters and less than 12 meters within a minimum range of 10-14 km.

These two radars will improve the detection of small vessels far beyond the horizon and help to recognize unidentified small, medium and large vessels.

The RANGER project aims to correlate the data from these two RADAR systems with different technologies and different detection ranges (coastal versus over-the-horizon). This allows a continuously monitoring of target from the coast to high sea and vice versa. This enhances the traceability and integrity of identification. Identification of cooperative vessels can still be pursued with traditional systems such as Automatic Identification System (AIS) and Vessel Monitoring System (VMS).

5.2 Situational awareness

The situational awareness for maritime domain is based on fusion of data from various sensors and data sources of every administration responsible for maritime surveillance in the MSs of the EU. Due to the enhanced size of the monitoring area and the improved target resolution provided by the developed radar RANGER project helps improving the global maritime situational awareness much before and with a much higher accuracy than using the current radar technologies in use.

RANGER will run continuously (update each 30 to 60 second) unlike the satellite radar which provides one pictures each 4 to 6 hours. After detection by RANGER, targets will be tracked with sophisticated single and multi-sensors data-fusion algorithms able to distinguish between clutter (islands, non-moving objects) generating false-alarms detections and together with current traditional technologies or satellite images could still be exploited to keep under control and recognize the detected non-cooperative vessels.

Furthermore, RANGER will improve situational awareness at national and European level at least in the following ways:

- facilitation of cooperation of law enforcement both nationally and internationally due to Advanced User interface which is specially designed to provide multiple categories of users
- increased situational awareness due to visualization of data through Graphical User Interface (GUI)
- facilitation of improved data exchange between different systems in maritime surveillance (such as transport, customs, fisheries control and defence) and with neighbouring third countries due to common interface
- improved quality of data due to integration of new kinds of data, merging process of various data, and use of learning algorithms in data analysis process.

The operational objectives could be achieved through the implementation of the RANGER component into EUROSUR Fusion Services providing the following benefits:

- increased situational awareness at the external borders and in the pre-frontier area due to merging data and integration of OTH Radar
- improved interagency cooperation at national and EU level due to contributing national and European situational picture as well as CPIP
- improved cooperation between Member States as well as with Frontex by sharing ship tracking data and information related to identification of vessels
- increased monitoring and tracking of vessels sailing inside the Blue Belt.

Improved maritime situational awareness along with enhanced capability to detect all types of vessels will provide more time and information for risk analysis potentially reducing the number of immigrants entering the Schengen area and therefore, the number of deaths of migrants at sea.

5.3 Reaction capability

According to Regulation (EU) No 1052/2013 EUROSUR should support the Member States in reaching full situational awareness at their external borders and increase the reaction capability of their law enforcement authorities. Surveillance of maritime areas requires increased coordination between Member States and within each State. This process requires a form of legitimacy of the services. RANGER must demonstrate to end-users its utility by including all needs and requirements. Without prejudging of the future work within WP2 and WP3, it is possible to outline some benchmarking criteria that demonstrates efficiency of RANGER project and can be used when assessing both the objectives and the final results of RANGER. It will improve reaction capability at least in the following ways:

- exchange of data, information and intelligence in close-to-real time and - whenever needed - in a secure manner, thereby tending towards a more intelligence driven approach based on risk analysis
- effective management of personnel and resources, including sensors and patrols
- advanced Graphical User Interface (GUI) with colour codes based on confidence of urgency
- integrated Early Warning System (EWS) providing automatic target recognition (ATR) and tracking
- fully automated and self-learning platform that will be able to generate on its own early warning and detection alerts of potentially suspicious vessels
- improved system performance due to settings and tuning ability that adapts to different sea configurations and weather conditions



- improved availability of different sensors and processing systems providing more flexibility and adaptability for RANGER's scalable and modular stand-alone system.

6. Means for Strengthening EUROSUR

Current state of EUROSUR system has to be analysed to provide guidance for RANGER project for strengthening EUROSUR. Analysis is based on this research and official reports. Affinity Diagram (AD) and brain storming methods have been used during analysis. The results will be distributed according to SWOT analysis matrix. Sub-section 6.1 review EUROSUR as such while sub-section 6.2 analyse RANGER project against EUROSUR framework. Means for strengthening EUROSUR will be discussed in the next section (7. Conclusions).

6.1 SWOT analysis on EUROSUR

The following features of EUROSUR have been identified as strengths, weaknesses, opportunities and threats. Strengths and weaknesses relates to internal factors of EUROSUR and they usually describe the present moment. Opportunities and threats are regarded as external factors of EUROSUR environment and they are future orientated. Categorization among internal and external factors have remain flexible to avoid limiting tendency (see section 2.5) to reach wide knowledge on EUROSUR.

<p><u>Strengths</u></p> <ul style="list-style-type: none"> - cost-efficient tool - decentralised architecture - scalable approach from local up to national and regional level - third country participation - developing services 	<p><u>Weaknesses</u></p> <ul style="list-style-type: none"> - non-uniform implementation in national level - different roles of NCCs - slowness to make changes in law - different organizational cultures - lack of confidence
<p><u>Opportunities</u></p> <ul style="list-style-type: none"> - harmonization on maritime surveillance - standardization on concepts, procedures, etc - improved situational awareness and reaction capability - enhanced SAR capability 	<p><u>Threats</u></p> <ul style="list-style-type: none"> - unpredictability of criminal trends - crime prevention requires more sophisticated and expensive solutions - discrepancy of EU and maritime policies - function creep from border surveillance to SAR missions

Table 4: SWOT analysis on EUROSUR

Strengths

- EUROSUR is cost-efficient tool for maritime surveillance providing enhanced situational awareness and reaction capability with flexible use of human and material resources.
- EUROSUR follows a decentralised approach. NCCs form the backbone for the operation of EUROSUR. Hence, most information is managed in NCCs offering the capacity to provide maritime information and added-value services to the Member States and EU community.
- Due to networked structure of EUROSUR all MSs already have the minimum required capability for further development of EUROSUR by upgrading and connecting their national infrastructures.
- FRONTEX has agreements with many European agencies and third countries and news are to come that allows EUROSUR to expand its maritime situational awareness.

- Projects have been conducted by FRONTEX to develop new services for EUROSUR operators. These projects have contributed to the edition of the "service catalogue".

Weaknesses

- Numerous national jurisdictions and overlapping powers among national agencies in maritime surveillance cause inconsistency in operation of EUROSUR in MS level.
- Different roles and powers of each NCC hamper the daily cooperation and smooth information exchange.
- Difficulty and time-consuming processes making changes into national legislation and interests conflicts among law enforcement slow down the development of EUROSUR.
- Different organizational cultures and sensitivity to exchange security related information does not encourage cooperation and information exchange.
- Due to the exclusive use of the AIS lack of national surveillance data in the maritime domain, in particular to detect and track small boats used for irregular migration and illicit drug smuggling.

Opportunities

- EUROSUR may constitute a new policy instrument which streamline cooperation and enable systematic information exchange between Member States on border surveillance.
- EUROSUR's technical and operational framework can considerably improve its own maritime situational awareness and thus the reaction capability of national authorities. It leads over time to a unified approach of actors at tactical, operational and strategic levels, allowing for informed and timely decision making and coherent execution based on the seamless and efficient sharing and exploitation of information by properly tailored processes and networks.
- EUROSUR can improve the detection, identification and tracking of all kind of boats, thereby supporting search and rescue (SAR) missions without prejudice to the functions and tasks which fall within the responsibility of Maritime Rescue Coordination Centres.
- EUROSUR can integrate up to date technology, such as s
- atellites or other surveillance tools for the tracking of vessels for border security purposes especially in high sea.

Threats

- Pressure from irregular migration at the EU external borders, largely facilitated by criminal networks, which are highly innovative and flexible in finding new methods and quick in redirecting migration routes. This may lead continuous change in operation environment and "arms race" between syndicates and law enforcement.
- Cross-border crime activities such as smuggling, counterfeit, trafficking in human beings, illicit drug trafficking, illicit arms trafficking, trafficking in radioactive and nuclear substances, and terrorism.
- Possible discrepancy of EU policies and critical voices of social interest groups may cause political struggles slowing down the development and implementation of EUROSUR.
- Enhanced situational awareness and improved reaction capability of EUROSUR may direct resources of border authorities from maritime surveillance to SAR missions.

6.2 Comparative SWOT analysis on EUROSUR/RANGER

In this section RANGER is compared against EUROSUR framework. Comparative SWOT analysis of EUROSUR and RANGER is performed to recognize which ways the RANGER Project will enhance the operational capacity of EUROSUR. Since RANGER solutions and services will be part of EUROSUR framework, observations done in section 6.1 concerning

EUROSUR are mainly valid for the RANGER project, too. Hence, they will not be repeated here. Section 6.2 emphasize on issues which are directly related to RANGER.

<p><u>Strengths</u></p> <ul style="list-style-type: none"> - compliance with EUROSUR framework - state-of-the-art radar technology - cost-efficient and labour-saving solution - Early Warning Engine (EWE) - standalone and modular architecture 	<p><u>Weaknesses</u></p> <ul style="list-style-type: none"> - different technology readiness levels in MIMO and OTH radars - use of multi-source data - data protection concerns (with reservations) - RANGER solution depends on the success of the project
<p><u>Opportunities</u></p> <ul style="list-style-type: none"> - integration of EU maritime surveillance - third country participation in maritime surveillance (new markets) - RANGER compatibility of legacy maritime surveillance systems may promote implementation of RANGER - budgetary constraints of law enforcement may force them to search for more cost-efficient and advanced solutions 	<p><u>Threats</u></p> <ul style="list-style-type: none"> - radar systems are expensive and long-lived systems delaying new acquisition - national concerns towards European integrated maritime surveillance - interest conflicts between authorities - organizational cultures - objection of EUROSUR can affect the RANGER implementation

Table 5: Comparative SWOT analysis between EUROSUR and RANGER

Strengths

- Compliance with EUROSUR Regulations and CISE environment towards the creation of a network allowing different public actors such as coast guards, traffic monitoring, environmental, pollution prevention, fisheries, border control, tax and general law enforcement authorities as well as navies to better communicate in view to efficiently cope with real time events.
- RANGER can promote implementation of EUROSUR through the adoption of cost effective technologies (OTH against satellite and aircraft).
- RANGER is able to provide continuous tracking to ensure the detection of anomaly or abnormal behavior and so raise relevancy of alarms while providing aid for optimization of resources.
- RANGER is able to strengthen the range of radar detection to expand the situational awareness especially on vessels of interest which are generally non cooperative (without identification such as AIS).

Weaknesses

- Difference in technological readiness levels (TRL) between MIMO and OTH radars which could distort the conclusions of the contributions of RANGER to EUROSUR.
- Enhanced capability to connect various data and complex data management processes may cause a risk to disclose personal and sensitive data.
- Failure of one or several of the consortium members may endanger RANGER to achieve its objectives.

Opportunities

- Integration of European maritime surveillance and maritime policies have a positive impact on the synergistic approach promoting implementation of RANGER.
- Ensuring RANGER system compatibility and interoperability with legacy systems and EUROSUR Fusion Services (including internal/external connectivity, data exchange standards and mechanisms, security standards, etc.) promotes implementation of RANGER.
- Due to stand-alone architecture of RANGER it is easy to introduce in the third countries and adapt it to legacy maritime surveillance systems.

Threats

- Radars are long-lasting and expensive systems resulting slow progress in the introduction of new solutions like RANGER.
- National concerns towards European integrated maritime surveillance may delay implementation of RANGER solution in the MSs of the EU.
- Interest conflicts between authorities. How to share sensitive border information since such information proves the reason for each security force’s existence and role at the borders.
- Due to every new interface requires learning process it may retard the deployment of RANGER.
- Changes in legislative framework in one or more European Countries may cause delays for the RANGER project.
- Objection and/or slow progress of EUROSUR may impact negatively on implementation of RANGER.

6.3 Recommendations and requirements for RANGER

This section summarizes the most important findings of this document. Research results have been translated into recommendations and requirements for RANGER project.

The requirements can be grouped in several ways. Often the requirements are divided into technical and operational requirements. As illustrated by deliverable D2.2, the same requirement can be viewed at the same time, either an operational or technical point of view. As a result, the requirements in this report is grouped on the one hand based on EUROSUR Regulation, and on the desktop research, on the other.

Recommendation	Requirement for RANGER
Interoperability	
Ensure RANGER system compatibility and interoperability with legacy maritime surveillance systems in Member States.	Compatibility with huge range of maritime surveillance systems and data management processes.
Ensure RANGER system compatibility and interoperability with maritime surveillance systems in third countries.	Compatibility with third-country maritime surveillance systems, which have different technology readiness level.
Ensure RANGER system compatibility and interoperability with EUROSUR Fusion Services.	Internal/external connectivity, data exchange standards and mechanisms, service delivery criteria and processes (e.g. service interruption times), security standards, etc
Improve availability of different sensors and processing systems providing more flexibility and adaptable system.	Scalable and modular architecture and stand-alone system.

Recommendation	Requirement for RANGER
Situational awareness	
RANGER shall increase situational awareness.	Improved detection, verification and identification of small boats (higher detection rate, increased spatial accuracy of target accuracy).
	Increased surveillance area, increased information from pre-frontier area.
Reaction capability	
RANGER shall increase reaction capability.	Improved tracking of vessels, improved detection of abnormal behaviour in the high seas.
	Fully automated and self-learning platform that generates its own early warning and detection alerts of potentially suspicious vessels.
	Integrated Early Warning System (EWS) that provides automatic target recognition (ATR) and tracking.
	Advanced Graphical User Interface (GUI) with colour codes based on confidence of urgency.
	Use of near-to-real time information on maritime surveillance (refresh rate of 30/60 seconds).
Costs and efficiency	
Proven efficiency of RANGER.	Due to EUROSUR follows research based approach RANGER solution and services shall demonstrate cost-efficiency and prospects of labour-saving working procedures.
Improved general system performance.	Adaptability to different sea configurations and weather conditions (e.g. through modification of antenna array).
	Demonstration of reduced number of false alarms.
RANGER shall be a cost-efficient system.	Demonstration on costs concerning establishment, running and maintenance of RANGER system.
RANGER shall be a labour-saving solution.	Development of visually informative and user-friendly graphical user interface (GUI)
Fundamental and human rights	
Improved quality of data.	Integration of multi-source data, data verification criteria and processes, use of learning algorithms in data analysis.
Readiness for future development of EUROSUR.	Readiness to process personal data.
Full consideration of societal, ethical and legal aspects of RANGER.	Use of privacy by design approach in data management.

Table 6: Recommendations and requirements for RANGER

The aforementioned requirements will be included, analyzed and classified according to their priority level in D2.5 (RANGER System Requirements (first version)).

7. Conclusions

There is limited availability on information on European maritime surveillance and EUROSUR. This is the main reason why this report have established different approach and methodology to review EUROSUR. It has been examined by a multi-disciplinary framework providing possibly divergent interpretation of EUROSUR. Use of sense-making theories and communities of practice approaches highlights different interpretations of “reality” – in this case EUROSUR. Even though these conception may differ what have been considered as the “official truth” one can claim that there are not such as a matter than “truth” or fixed knowledge of EUROSUR, rather, a number of different interpretations of reality. According to Wenger (1998, 55), within communities of practice, meaning is negotiated through a process of participation and reification. In this study “negotiation” was performed through discussion analysing official documents and research reports.

Discussion on EUROSUR in section 4 indicates that opinions were sharply divided between official bodies and civil society. When the official reports point EUROSUR benefits, research is mainly focused on EUROSUR system disadvantages for individuals and societies. EUROSUR allegedly marginalize the migrants placing them at risk and inhumane treatment. Criticism against intensified maritime surveillance and use of the-state-of-the-art technology has to be taken seriously in RANGER project. It seems obvious to disseminate relevant data (e.g. through project website, leaflets, presentations, articles, etc.) and communicate about the benefits of RANGER (enhanced situational awareness and reaction capability, cost-efficiency, etc.). Use of participatory measures (surveys, interviews, workshops) for end-user involvement whenever possible may promote RANGER solution implementation in the future. Concerns regarding data protection and privacy can be taken into account by adhering to privacy by design approach.

Implementation of EUROSUR has met numerous challenges like political struggles, technical problems, administrative (judicial) conflicts, etc. Hence, it is highly important (and to avoid further objection) to follow concepts, models, standards, methods, procedures, etc. that are fully compliance in EUROSUR framework. For that purpose EU policy papers (e.g. EU Regulation No 1052/2013, EUROSUR Handbook 2015), Frontex documents and project reports shall be used to reconcile RANGER with the EUROSUR framework.

Analysis on patterns and trends of migration to Europe clearly indicates that it will be a growing challenge for the future. Official reports (e.g. from Frontex, the EU, and project reports) highlights the importance to further develop EUROSUR. BORTEC Feasibility Study¹³ recommended that “serious consideration” be given to the “further development of sensors, airborne and space borne unmanned means” to detect any vessel “of any size and material and an estimation of its speed and tack “in all weather conditions/sea state, day and night.” (Hayes & Vermeulen 2012, 15). Thus, there is a clear need for sophisticated maritime surveillance systems like RANGER.

In many EU countries law enforcement are struggling with ever-diminishing public funding. It is highly important that future technological applications demonstrate not only improved performance but improved cost efficiency. Frontex has also emphasized adapting EUROSUR to the declining resources. According to Frontex report (2015) on the functioning of EUROSUR:

¹³ Study on technical feasibility of establishing a surveillance system (European Surveillance System), Warsaw, presented by FRONTEX on 12 January 2007.

“For the development of Operational Layer further integration work will be carried out as requested by the Member States aiming at increased effectiveness, reduced operator workload and improved user experience (ibid. 12)”.

In order RANGER to achieve its objectives and become part of the future EUROSUR system, it is important to demonstrate the operational, functional, and economic benefits of RANGER solution during the project, and thereafter. More specifically:

- 1) RANGER shall be aligned with EUROSUR framework.
- 2) RANGER shall demonstrate added-value for EUROSUR in regards to:
 - enhanced situational awareness
 - enhanced reaction capability
 - cost-efficiency
- 3) RANGER shall meet requirements of:
 - various communities of interest
 - service-orientation and standardisation
 - technical flexibility and adaptability

Annex A - List of Tables

Table	Title
1	SWOT analysis matrix
2	Events inserted in EUROSUR network application either by MS, SAC or Frontex node and type
3	Incidents inserted in JORA since enter into force of the EUROSUR Regulation, and until 4 November 2015.
4	SWOT analysis on EUROSUR
5	Comparative SWOT analysis between EUROSUR and RANGER
6	Recommendations and requirements for RANGER

Annex B - List of Acronyms

Acronym	Meaning
AD	Affinity Diagram
AIS	Automatic Identification System
ALUG	(Frontex EUROSUR) Analysis Layer User Group
ATR	Automatic Target Recognition
CBA	Cost-Benefit Analysis
CIRAM	Common Integrated Risk Analysis Model
CoP	Communities of Practise
CPIP	Common Pre-Frontier Intelligence Picture
EBF	External Borders Fund
ECN	EUROSUR Communication Network
EES	Entry/Exit System
EFCA	European Fishery Control Frontex
EFS	EUROSUR Fusion Services
EMSA	European Maritime Safety Frontex
ESP	European Situational Picture
EU	European Union
EUROSUR	European Border Surveillance System
EWE	Early Warning Engine
FCOI	Frontex Compatible Operational Image
FLIR	Forward Looking InfraRed
FPS	Frontex Positioning System
FRAN	Frontex Risk Analysis Network
FSC	Frontex Situation Centre
GMES	Global Monitoring for Environment and Security
GPS	Global Positioning System
GUI	Graphical User Interface
HFSW	High Frequency Surface Wave
IA	Impact Assessment
ICC	International Coordination Centre
IT	Information Technology
JO	(Frontex) Joint Operation(s)
JORA	Joint Operations Reporting Application
MCA	Multi-Criteria Analysis
MRCC	Maritime Rescue Coordination Centre
MS	Member State
NCC	National Coordination Centre
NSP	National Situational Picture

NVG	Night Vision Goggles
OPLAN	Operational Plan
OTH	Over-The-Horizon (Radar)
PE-MIMO	Photonics Enhanced MIMO (Radar)
PEST	Political, Economic, Social and Technological Analysis
RAU	(Frontex) Risk Analysis Unit
RTE	Real-Time Evaluation
RTP	Registered Traveller Programme
SAC	Schengen Associated Country(ies)
SAR	Search and Rescue
SAT CEN	Satellite Centre
SBI	Secure Border Initiative
SLA	Service Level Agreement
TRL	Technology Readiness Level
UAV	Unmanned Aerial Vehicle
USP	Unique Selling Point
US-VISIT	US Entry/Exit system
VDS	Vessel Detection Service
VMS	Vessel Monitoring System

Annex C - References & Relevant Readings

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