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EUROPEAN UNION
European Regional Development Fund - Instrument for Pre-Accession II Fund

TRANSCPEARLYWARNING

TransCPEarlyWarning Civil Protection Early Warning Platform

General description

"TRANSCPEARLYWARNING": Establishment of "TRANSnational Civil Protection EARLY WARNING System" to improve the resilience of Adrion territories to naturaland man-made risks.

JUNE 2022

Disclaimer

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TRANSCPEARLYWARNING: Establishment of "TRANSnational Civil Protection EARLY WARNING System" to improve the resilience of Adrion territories to natural and man-made risks (ADRION 979)

Programme Priority 2. Sustainable Region

Specific Objective: Enhance the capacity in transnationally tackling environmental vulnerability, fragmentation, and the safeguarding of ecosystem services in the Adriatic-Ionian area
WP T2 – Civil Protection & Early Warning Platform linked to the EU Civil Protection Mechanisms
Activity T2.1 – Development of Civil Protection Early Warning Platform
Deliverable T2.1.2 – Civil Protection Early Warning Platform with semantics interface

Responsible Author: PP3 - Athanasios Kalogeras, Christos Anagnostopoulos, Agorakis Bombotas, Georgios Mylonas, Christos Alexakos, Kyriakos Stefanidis, Georgios Kalogeras, Georgios Raptis, Stella Markantonatou, Miranda Dandoulaki, Georgios Lefteriotis

Editors: External expert Dynamic Vision - Ioannis Mardikis, Natalia Tsami

Project Coordinator: ***LP – Regione Molise***

INTERREG ADRION Programme

2014-2020

The TransCPEW platform

The TransCPEarlyWarning Civil Protection Early Warning Platform (**TransCPEW platform**) aims to unify and automate the various Civil Protection (CP) processes regarding the prevention of natural and man-made disasters. **It serves the purpose of offering a focal point of reference for the Civil Protection stakeholders in ADRION territories** enabling the integration of different information sources and systems and will make it possible for CP stakeholders to perform the relevant experimentation through pilot implementations.

The creation of the Platform involved several preceding steps that resulted in gathering the necessary information and extracting the correct user requirements from it. The first step was a thorough analysis of the Civil Protection Early Warning frameworks in Italy, Greece, Bosnia-Herzegovina, Croatia, Slovenia, Albania and Montenegro, which resulted in a firm understanding of the current regulatory status of Early Warning (EW) mechanisms in each participating country. Existing procedures related to Early Warning were extracted and broken down into basic modules that appeared to be repeatable in each country. Finally, consultation with Civil Protection officers provided the necessary expert knowledge regarding requirements that needed to be included in the Platform's design.

The TransCPEarlyWarning Civil Protection Early Warning Platform provides a number of functionalities that comprise
(i) the design, execution and monitoring of Civil Protection Early Warning procedures,
(ii) the provision of access to different tools/sources of information related to Civil Protection for facilitating everyday routine of Civil Protection stakeholders,
(iii) the experimentation with open datasets and open source code algorithms for the wildfire and flood risks addressed by the project, and
(iv) the provision of an appropriate web enabled multilingual secure user interface to enhance Civil Protection stakeholder experience in the ADRION macro-region.
The proposed platform attempts to provide a unified solution that includes functionality for designing, executing and monitoring the stages of an early warning procedure. The system consists of three discrete subsystems that are interconnected through APIs over the HTTP protocol. Those subsystems are in turn divided into smaller components that perform specific tasks. This modular design makes the system **flexible** and **upgradable**, two qualities absolutely necessary when dealing with complex, dynamic, and diverse processes. As shown in Figure 1, the three main subsystems, are the Early Warning Processes Designer, the Execution Engine and the Early Warning Dashboard.

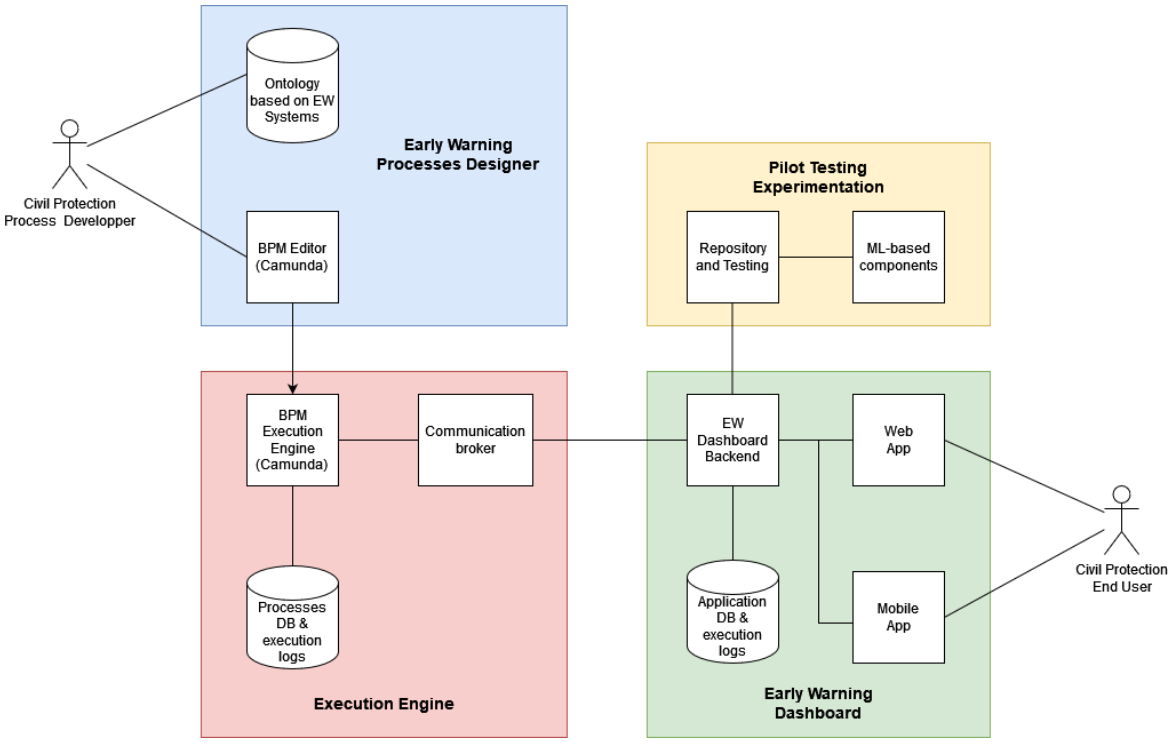

Figure 1 : TransCPEarlyWarning platform conceptual architecture

The **Early Warning Processes Designer** is a tool that simplifies the design of an EWP and its main users will be Civil Protection officers. It provides to users a simple and intuitive GUI that helps them design new processes or to trasnform the existing ones. An excellent open source editor that can be used for the platform's purposes is Camunda's web editor. For providing guidance and insightful suggestions to the users, the subsytem utilises the ontology that was created from the existing EW Systems.

The users' input is then processed by the **Execution Engine susystem**. The heart of this susbsytem is the BPM execution engine module. This module will not be developed in house but an existing open source system will be emplyoed. Once again Camunda provides the required functionality and an HTTP API that enables its seamless embedding in the platform. Moreover, the Execution Engine susystem also includes a Machine Learning module that will automate tasks that require constant monitoring such as the early detection of a natural disaster. For connecting the BPM execution engine to the Machine Learning module and to the third susbsystem (Early Warning Dashboard) as well, a Communication broker is required. This module will act as an intermediate betweeen all the other components and will orchestrate the dissemination of the information.

The third susbsytem is the **Early Warning Dashboard** and can be viewed as the presentation layer that will notify the end users of the platform (state officers, volunteers etc.) and display them all the information they need to respond to an unfortunate event in a timely fashion. The Early Warning Dashboard consists of a backend that is connected to the Execution Engine and feeds with the appropriate information the two frontend applications. These two applications provide the same functionality and differ only to the device they run on. The first one is a web app that will be optimized

for running on Desktop web browsers while the second one is a mobile app optimized for devices such as smartphone and tablets.

Based on the accumulated data and knowledge, this web enabled, semantically enriched Platform was designed and implemented. The Platform allows Civil Protection officers to perform all of their duties from a single unified and easily accessible point all. These include:

- ✓ access to the different information sources and systems utilized in their everyday routine with reference **to forest fires and floods**
- ✓ monitoring and management of the early warning process within their area of responsibility
- ✓ communication and message forwarding to other stakeholders based on the procedure defined from the existing framework in each country
- ✓ process design and modification, according to the needs of the Civil Protection organization that a user represents

All the above are presented through a Graphical User Interface that is designed specifically to aid users in their work by highlighting the most important information and actions that need to be taken. The Platform has been designed to follow accessibility and security by design principles. It also offers multilingual support to enhance user interaction with platform modules and services

The **Pilot Testing Experimentation component** provides some additional capabilities to the platform as regards recent experimental advancements in the early warning field. More specifically, it will provide a repository of existing implementations and datasets for AI-based early warning system implementations, as well as some basic experimentation capabilities, in order for the project's community to familiarize itself with such aspects, as well as understanding current needs in the field in order to be applied to the ADRION area.

There are two main user groups of the TransCPEarlyWarning platform:

- **Civil Protection process developers:** group of experts whose job is to design and develop the processes through the BPM execution engine module.
- **Civil Protection end users:** group of Dashboard users (CP officers). Dashboard users are divided in two more categories: the "administrators" and "normal users". Administrators have full access to all parts and functionalities of the system. An administrator can create, delete users, as well as give them access to the system modules that they are required to see according to their role in the hierarchical and administrative schema of the Civil Protection Early Warning system. Normal users on the other hand can view and modify only basic profile information, as described in the following section.

Involved parties and external bodies:

Central Bodies: Central Bodies are responsible for monitoring and applying the Civil Protection processes at a country level.

2nd Level Administration: The 2nd Level Administration is responsible for monitoring and applying the Civil Protection processes at a regional level.

3rd Level Administration: The 3rd Level Administration is responsible for monitoring and applying the Civil Protection processes at a local level

Organizations: With the general term “Organizations” we describe all those organizations (volunteers or not) that do not belong to one of the aforementioned categories.
Media: Media describes the mass or social media used to inform the public.
External Sources of Information: These are the systems used in every country for obtaining additional information that is useful in the decision-making process.

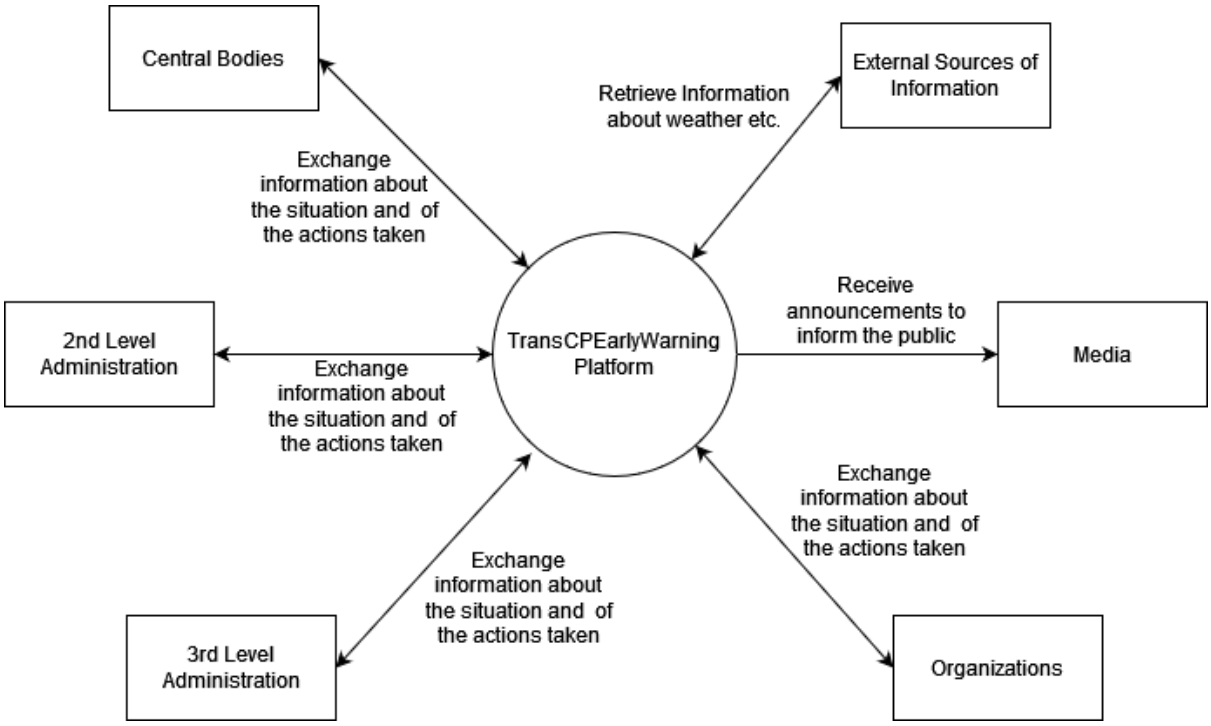

Figure 2 Context diagram that describes the role of all the involved parties and external bodies