Improving and Harmonizing Healthcare Processes Across Europe

PULSE Platform for European Medical Support during major emergencies

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The Challenge

Challenged with deadly threats such as pandemic diseases, large scale accidents or natural disasters and major terrorist attacks, it is crucial for the European Health System (EHS) to remain in an excellent state of preparedness supported by first-class planning and decision support tools.

Notwithstanding the application of international agreements (WHO, EU) the current state of affairs is characterised by the response of a multitude of organisations, services and stakeholders acting on national, regional or local level, regulated by nation specific rules of law using legacy and proprietary systems and procedures.

Within this general framework, the European Commission tasked a European consortium of analytical, industrial, healthcare and research organizations to analyze and demonstrate capabilities for improvement and harmonization, by creating the PULSE project, on "*Development of decision support tools for improving preparedness and response of Health Services involved in emergency situations*"

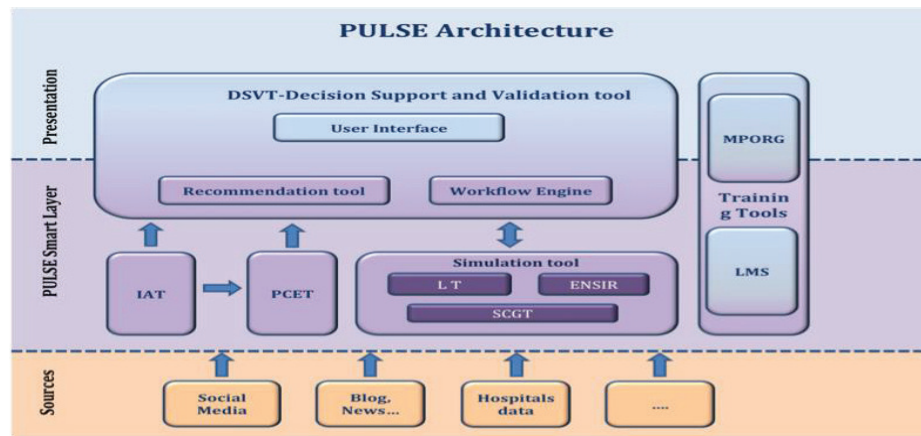### The PULSE Project (http://www.pulse-fp7.eu)

In order to mitigate national inadequacies and to improve communication, coordination and harmonization across Europe, an IT platform including a set of innovative functional tools has been designed integrated, demonstrated and validated to enhance planning and decision support in the areas of:

- Intelligence Information Gathering,
- Treat and Risk Analysis, Warning & Alerting,
- Operational picture Generation & Situational Awareness,
- Tasks and Resources Planning,
- Training and Exercising,
- Knowledge Management.

Via these supporting functions, the main objectives of the PULSE system should be achieved, which are timely access of decision makers to key data, better inclusion of social media, advanced training techniques, reduction of bureaucratic effort, and ultimately, optimum triage, and assignment of victims to and treatment in hospitals.

An Innovative Platform and Tools

Architecture and main components of the system are depicted below.

DSVT Decision Support and Validation Tool
IAT Intelligence and Analysis Tool
PCET Post Crisis Evaluation Tool
LT Logistics Tool
SCGT Surge Capacity Generation Tool
ENSIR Event Evolution for Bio-events
TT Training Tools
MPORG Multi Player Online Role Game (used as TT and for Demo support)
LMS Learning Management System
APP Smartphone APP

The overall platform offers flexible and adaptive operational picture generation, controls inter-operation between the individual tools, and sets a standard for interoperability with other systems via the application of common web-based interfaces.

Testing, Demonstration, Evaluation

The whole system was demonstrated and evaluated through being implemented and demonstrated in two realistic scenarios: An interactive tabletop exercise in Italy with a scenario of a serious viral disease evolving across Europe, and a live exercise in Ireland with mass casualties caused by a crush in a Stadium. These scenarios were deliberately chosen in order to test the system in essentially different environments in terms of threats, timeframe and dynamics, type and numbers of affected people, services and resources required. This way, the PULSE system proved its effectiveness, performance and benefits to both, the health services and society. It proved its flexibility and usability across a wide spectrum of public health activities and demonstrated the capability to serve as a standard across Europe. It was also evaluated with respect to its societal and ethical acceptance, compliance to legal and political settings, and –to some extent- its economic value.

Summary and outlook

Measured over a total of 82 diverse evaluation criteria, the PULSE platform, having demonstrated its benefits and overall applicability, was rated very positive by the participants. Despite this obvious requirement for such a system and the improvement potential of the PULSE system for European health services operations, due to health systems being so heterogeneous across Europe, it may be a long and tedious way until such a system will be introduced at a significant scale, let alone becoming a standard in Europe. From a scientific and technical point of view, the results should be encouraging.

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