

Emergency Management research at the ISSI Group

The Software Engineering and Information Systems (ISSI, following its name in Spanish) was created by Prof. Dr. Isidro Ramos in the late 1990s at the Universitat Politècnica de València, in Spain. Since then, its members have developed research work in several disciplines within Software Engineering (e.g. requirements engineering, software architecture, model driven software development, software product line engineering, software quality, empirical software engineering, agility) and Information Systems (e.g. digital libraries, ambient intelligence systems, emergency management). The group is currently led by Dr. José H. Canós Cerdá.

The group started the R&D work on Emergency Management in 1998, when they designed and developed the Hypermedia Emergency Plan of Metrovalencia, the underground transportation company in Valencia, Spain [1]. From there on, the group has focused on the design and development of tools to support emergency plan design, development and management. Following this trend, we are interested in the topic ***SEC-01-DRS-2016: Integrated tools for response planning and scenario building*** of the H2020 Work Programme for 2016-2017.

Emergency plan development tools

Innovations in document design and dissemination have not reached the universe of Emergency plans. Today, emergency plans are just like 20 years ago: large, text-based documents that must be accessed sequentially in order to find the right information when needed. Moreover, the most frequent tool used to write emergency plans is a word processor, in a process with plenty of text reuse, where the customization is made by hand (which implies a high rate of errors).

We have moved towards a new generation of emergency plans as live artifacts that integrate hypermedia with data from other sources, and that use innovative technologies that replace natural language narrative: flexible process specification languages for defining the coordination among teams, digital library technology to manage multimedia information, collaborative tools to support decision-making, etc. Additionally, we have developed DPL, a Document Engineering Framework for the definition and development of families of documents following a product line approach. With DPL, content is written once and reused (and customized) as many times as needed. Documents built using DPL are fully customized since the document engineer can select the components to be incorporated to it, which are added from a repository without any manual editing. We use DPL to support emergency plan building, as described in [2].

SAGA: a platform for the integral management of emergency plans

Governments are starting to officially rule the management of emergency plans. In Spain, for instance, the structure and basic content of emergency plans, as well as their management processes, are prescribed in a nation-wide law. Besides the need of providing means to enforce such a law, authorities should provide organizations with tools for elaborating their emergency plans. The ISSI group has developed SAGA, a framework for the integral management of emergency plans [3]. SAGA includes emergency plan development tools, knowledge repositories for planners, facilities to use modern process languages together with their associated execution environments, and analysis tools. The aim of SAGA is to help

governments to set up a Web-based universe of emergency plans where knowledge can be organized, shared and, if needed, reused across similar organizations, reducing individual development efforts and ensuring quality via content reuse.

A quality-driven approach to emergency plan management

Despite the relevance of the emergency plan in the overall emergency management lifecycle, little attention has been paid to aspects related to the assessment of the quality of current emergency plans. As a consequence, planners develop their emergency plans without a reference framework allowing the assessment of the artifacts developed and providing mechanisms for the improvement of plans. But defining quality of emergency plans is not easy: different communities have different views of quality, and a global quality model is still to come. The ISSI group is developing QuEP, a framework for the assessment and improvement of the management of emergency plans within organizations [4]. It is inspired by the Total Quality Management strategy, and provides a hierarchy of emergency plan management maturity levels. The aim of QuEP is to guide organizations to assess and improve their emergency preparedness by following a set of principles, practices and techniques at the technical, human and strategic levels, and how to contribute to more resilient emergency plan management.

References

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