

On the Role of Process Models in Risk and Disaster Information Management

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There is considerable effort to cover the broad variety of types of risk including natural disaster risk, technical disaster risk, biological disaster risk, transport and energy, research and innovation, critical infrastructure protection, cross-border health threats, implications for the health service systems, environmental impact assessment, green infrastructure, integrated coastal management, agriculture, food and nutrition security, water, flood risk management, major industrial accident prevention etc.

The complexity of actors and their information needs in all phases of risk and disaster management (from alarm and first aid through prevention measures) is in due need to be structured not only semantically by appropriate methods of meta-information but at the same time, pragmatics structures (workflows, service orchestration, etc.) need an appropriate corresponding framework of business process models.

Currently, the strategic programs of the Hyogo Framework of Action [HFA2] are under global discussion and the corresponding discussions at EU level (Union Civil Protection Mechanism (2013), Managing Risk to Achieve Resilience (2014)) also clearly indicate on the methodological and technological challenges that are faced in this domain.

An overall strategy for information exchange for and between sectors of information society members (including private business, industry, the health domain, agro- [CL01] and food supply chains, lawyers, chambers of professions, etc. etc.) is not developed.

In the future, data flows should be much more specified on the basis of user decision process requirements engineering, centering on actors' information requests [KRE10].

The development (modeling, specification, and implementation, tests etc.) of information standards in these domains is a process of broad involvement of competences from all actors' domains. "Big Data in RISK" (massive and at the same time structurally very complex and heterogeneous data) is in due need for not just "being available" but instead being interoperable for detailed analysis and decision support in a technically controlled way to allow measures of information services quality and contribute essentially to the requested high level of transparency and accountability.

Compared to the current situation of making data of different type and different analysis available for use in risk and disaster management, it is necessary to anticipate and model the broad effects of risk situations and potential disaster on population and economy in an actor-oriented much more differentiated manner and to support the appropriate alternatives of responses based on extensive informational and communicational principles.

The application of complex process modeling will allow control and analysis of information services for decision making in humanitarian situations in a much more reliable way and especially would lead to document and control alternative fact sets as well as contexts and thus contribute essentially to transparency and accountability in all phases of the disaster cycle.

References

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Keywords

risk information management, risk information models, risk information interoperability, standards development, risk information processes modelling and applications, services and service composition, natural, technical, chemical risks from local to international level, risk information system structure, components, risk-related databases and information system components, risk and risk-model change in time and space, risk modeling issues for infrastructure (e.g. factories, railways, highways, pipelines, maritime traffic etc.), disaster management and emergency preparedness, prevention, alert, response and mitigation, health and biological risks issues for humans, and the environment, risk communication, decisionmaking, actors, accountability