Karlsruhe Institute of Technology

Institute for Nuclear and Energy Technologies
Accident Management Systems

PREPARE

Web-based decision support system for emergency management

System architecture and enhancement possibilities

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MOTIVATION

Time pressure, uncertainty, multiple stakeholders and distributed responsibilities are some issues crisis management is confronted with. Computerized decision support can help analyzing the event to identify appropriate management strategies. Supporting systems have emerged by and by for several years, often specialized in certain disaster types mostly with the need to be installed on local machines.

OBJECTIVES

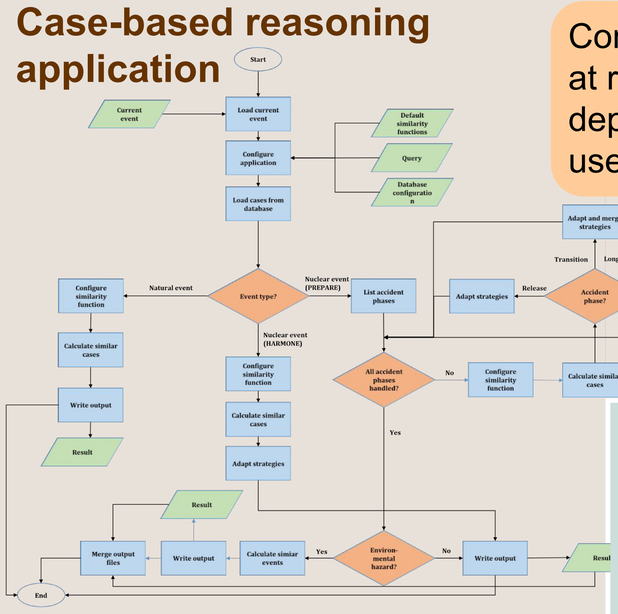
- **Easy-to-access decision support** without pre-required software installations.
- **Facilitated information exchange** for users located in different places.
- **Generic system design** allowing **easy expandability** of existing structures as well as integration of new event types.

Multiple disaster types may occur at the same time making a system capable of analyzing different event types highly valuable.

SOLUTION

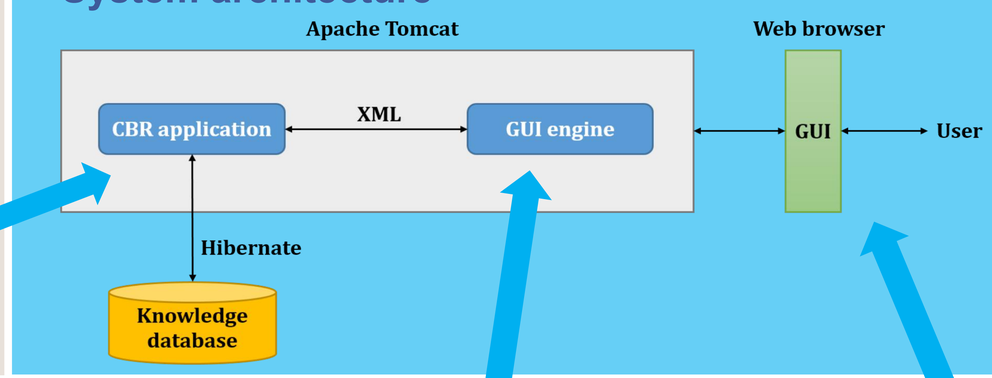
A decision support system has been realized as **web-based client-server architecture** with **Case-based reasoning** (CBR) as decision supporting backend, and has been successfully applied to **nuclear** and **several kinds of natural disasters**. The connection to the database, control of the program flow as well as generation of the input mask are **event type-dependent** and **configured with XML files** making flexible and easy enhancements possible.

Case-based reasoning application



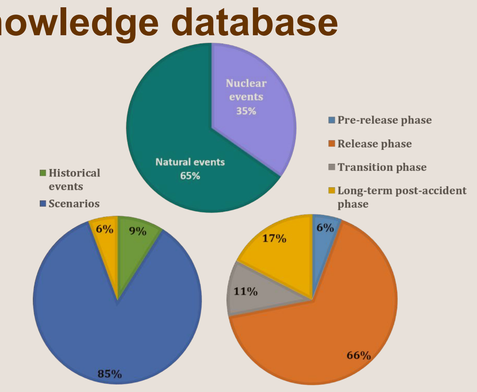
Configuration at run time depending on users‘ request

System architecture

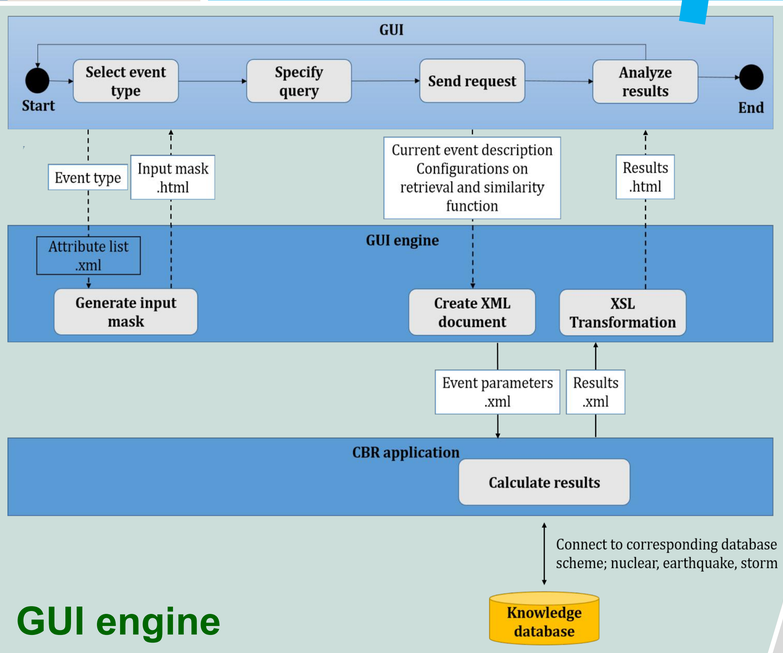


Web-based access
- No local installations
- Easy exchange of query parameters & results

Knowledge database

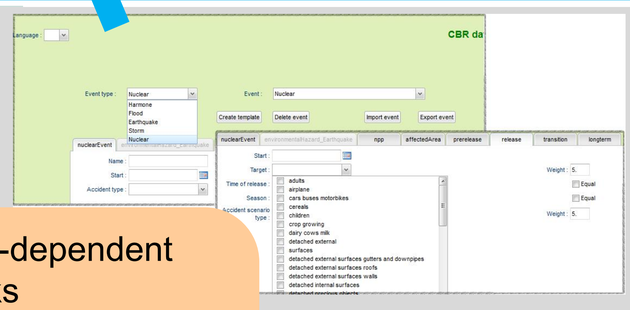


- Storage of historical events and expert knowlege prepared with JRODOS
- Hibernate allows flexible access and usage via XML cofiguration files

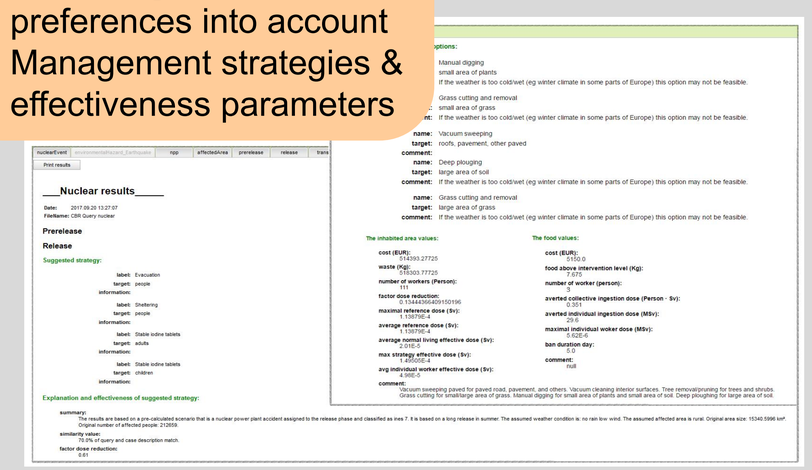


GUI engine

- Exchange with CBR application of query/results via XML files
- XSL transformation to HTML
- Query/result XML files can be imported and exported from and to other sources



- Event type-dependent input masks
- Flexible decision support tool taking individual preferences into account
- Management strategies & effectiveness parameters



Graphical user interface

OUTLOOK

- Extension of knowledge database
- Further in-depth analysis of uncertainty issues and different event types
- Investigation of end users needs with respect to visualization
- Feasibility study of integration in the operational procedures of emergency management

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