Towards a Common Vocabulary for Crisis Management Scenarios

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Outline

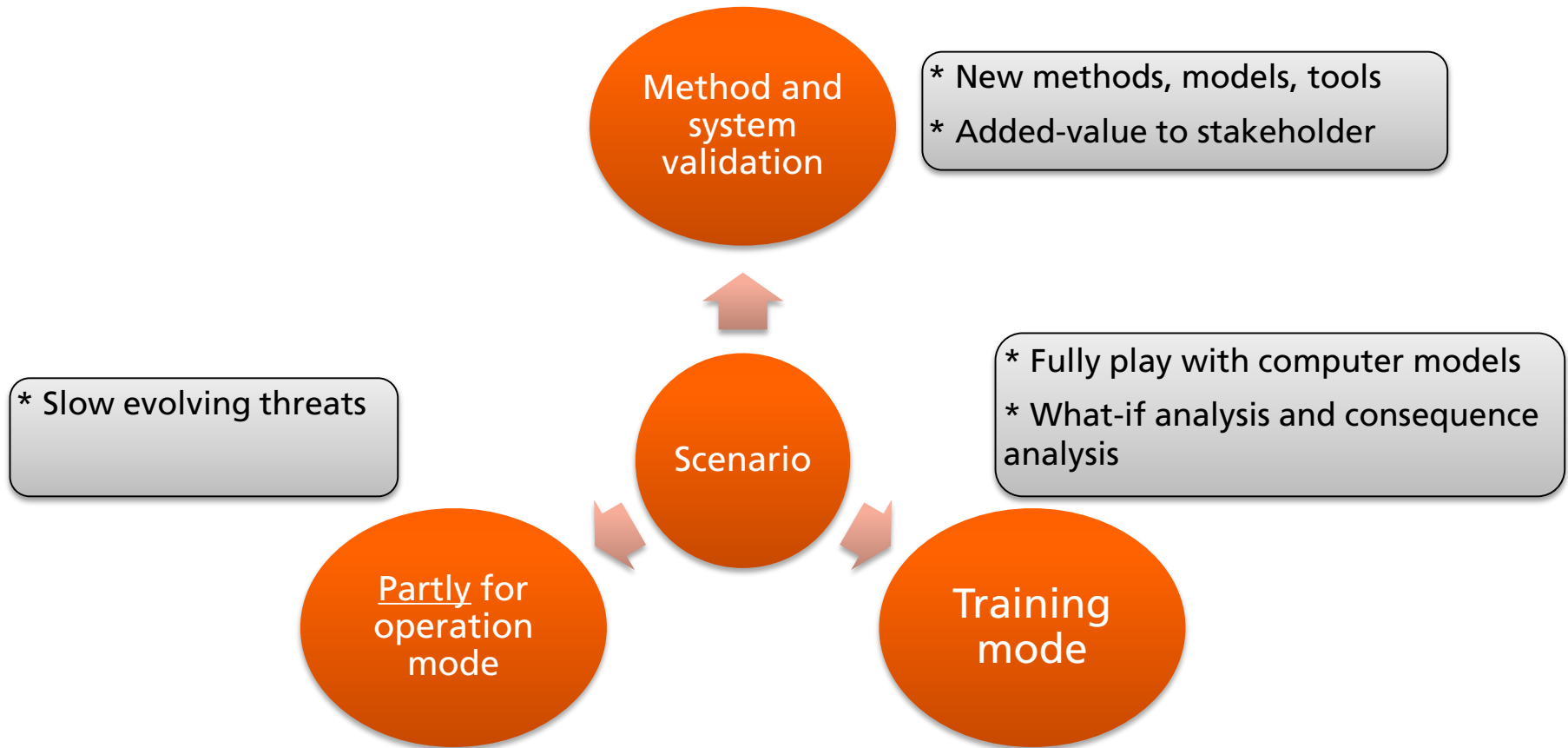Motivation of vocabulary for crisis scenarios

Essential elements in crisis scenarios

SDL - Scenario Description Language, ecosystem

Case study and future work

Motivation
Scenarios in crisis management

Method and system validation

* New methods, models, tools

* Added-value to stakeholder

* Slow evolving threats

Scenario

* Fully play with computer models

* What-if analysis and consequence analysis

Partly for operation mode

Training mode

Motivation
A common vocabulary to describe crisis scenarios

Common vocabulary for crisis scenarios understandable by **humans** + **computers**

Complex to develop:

1) crisis managers
2) domain experts
3) system engineers

Insufficient reusability:

1) Adapt to new projects

Low inter-operability:

1) Heterogeneous software systems

Essential elements in crisis scenarios

* Dynamic behaviours

* What could happen, conditional

Storyline and Events

Mechanism needed as glue!

* Threat models

* Infrastructure models

Domain Models

Consequence Analysis

* Societal and economic impacts

* Algorithms: Input-output-model

Rescue forces, police, hospitals, and ambulances, etc.

Resources

Response and Mitigation Actions

* Evacuation, distribute rescue forces

* Adjust contingency plan

SDL - The Scenario Description Language
Overview

- Declarative language with syntax checking

- Web-oriented Design

- What-if Analysis

- Internationalisation

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SDL - The Scenario Description Language
Examples

```
"model": [{
    "domain":"power",
    "s  periodic_events: [{
    "m    name: OpenTrack step simulation,
    "s    interval           {
 },      event:{              "event_id": "E001",
            "type"           "title": "$E001"
            payloa  }
               comm  ...
               "typ  "internationalisation": {
               to:      "$E001": {
            }               "en": "A train derails in the city of Emmerich.",
         }                  "de": "Ein Zug entgleist in Emmerich."
    }, {// mor           }
                      }
```

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SDL ecosystem
Software Tool Support

Scenario Executor

- Computer program that interprets a given SDL file
- Functionalities like start, stop, pause and continue, etc.

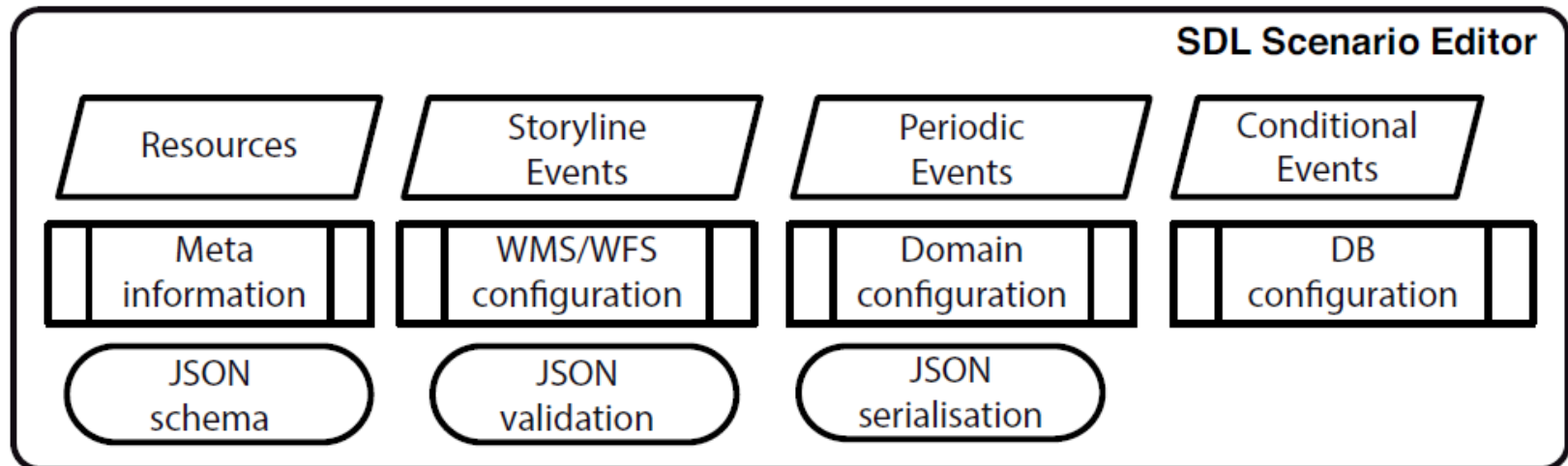### Collaborative Graphical User Interface

* HTML5-based Web application

* Collaborative training

* Advanced what-if analysis and Ssphisticated GIS support

Scenario Editor

* Speed up SDL-based scenario generation
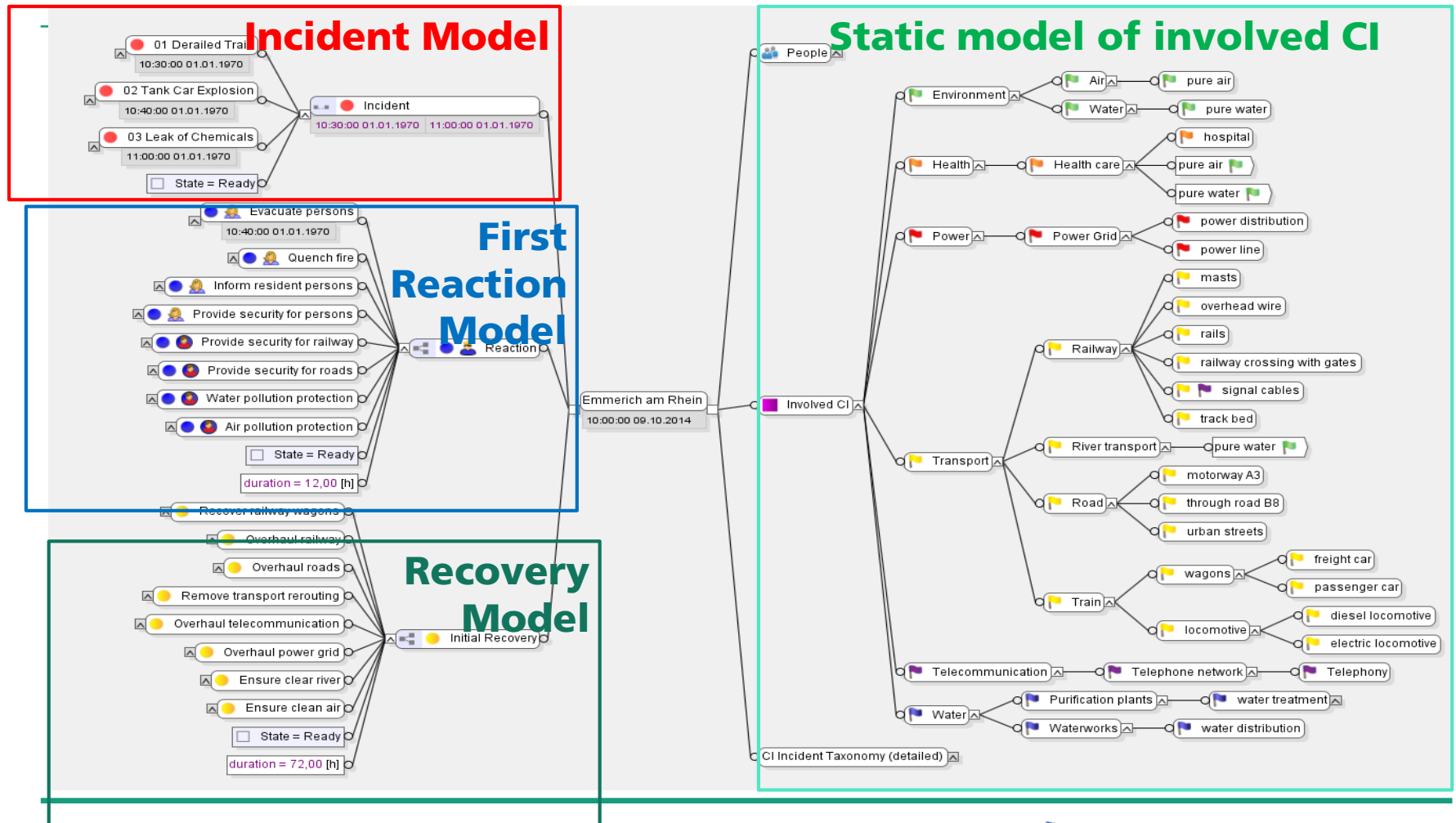
* Scenario element creation

* Automatic syntax checking

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SDL ecosystem
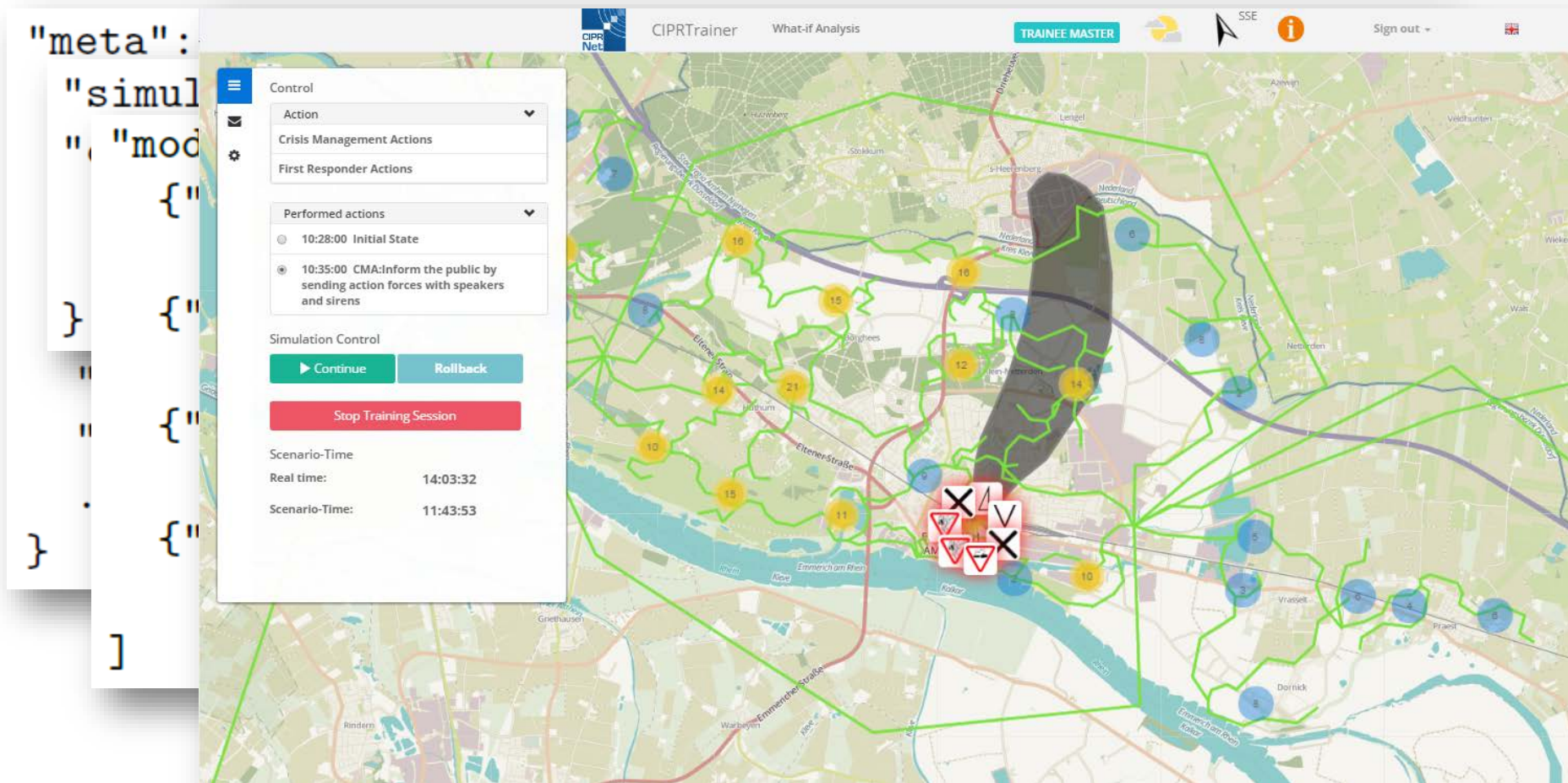Functional blocks of the scenario editor

SDL ecosystem
Screenshot of the scenario editor

Case study and future work
Case study

Case study and future work
Future Work

- To facilitate scenario development and validation in a more user-friendly way
- Integrated development environment for scenario generation, test and publication

Better tool support

- Publish SDL for community use
- Publish the simulation API and example for more domain-specific simulator
- Provide a cloud-based platform for different projects sharing **validated scenarios**

Envisioned European Scenario Database

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THANKS FOR THE ATTENTION
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