An Ontology-based Adaptive Reporting Tool

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Human generated information

”A group of Talibans visited my village and threatened to kill people if they didn’t get food.”

Human generated information

- Unique information
  - cognitive domain
  - indirect
- High informational value
- Human friendly “syntax”

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Human generated information

- Unique information
  - cognitive domain
  - indirect
- High informational value
- Human friendly “syntax”

- Natural language not suitable for automatic exploitation
- NLP limited accuracy (complex domain, little data)
- Today: Manual tagging to get structured information

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Direct input of structured information?

Input of structured information using ontologies

- Formal language is precise, prevents *unintentional* fuzzy statements
- Ontology based on a shared understanding, increases interoperability
- Formal language is compact, potentially faster input
- Accurate transfer to automatic exploitation

- *Beware: Limits expressivity (and possibly the mind)*

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Tool requirements

- Intuitive to a non-expert
- Domain independent
- Output in rdf-triples
- Adapt to
  - context
  - external information needs

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Related work

- Semantic query systems
  - Natural language
  - Controlled natural language
  - Graphical query tools
  - Forms
- ”Knowledge elicitation scripts”, e.g. Disciple-RKF

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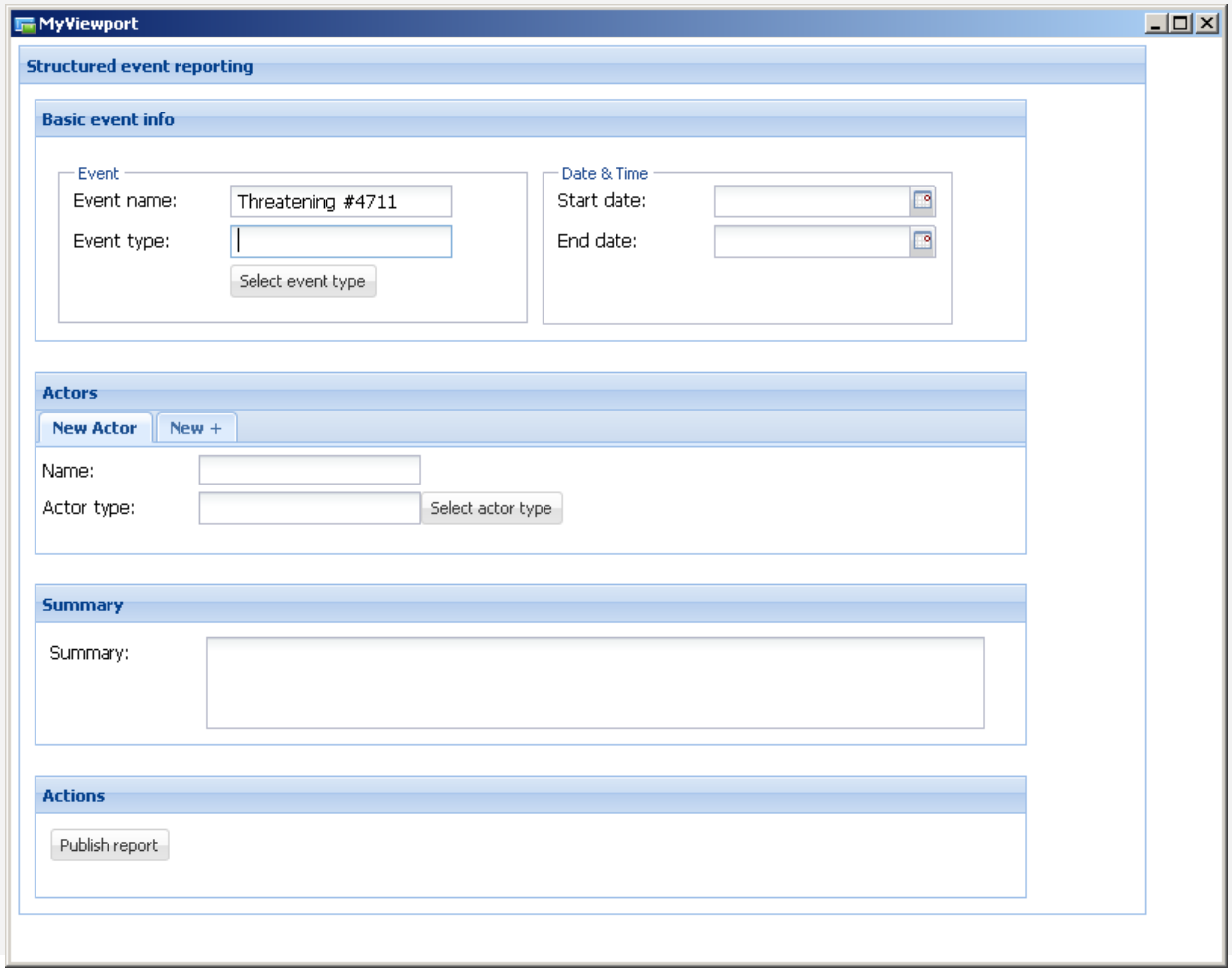
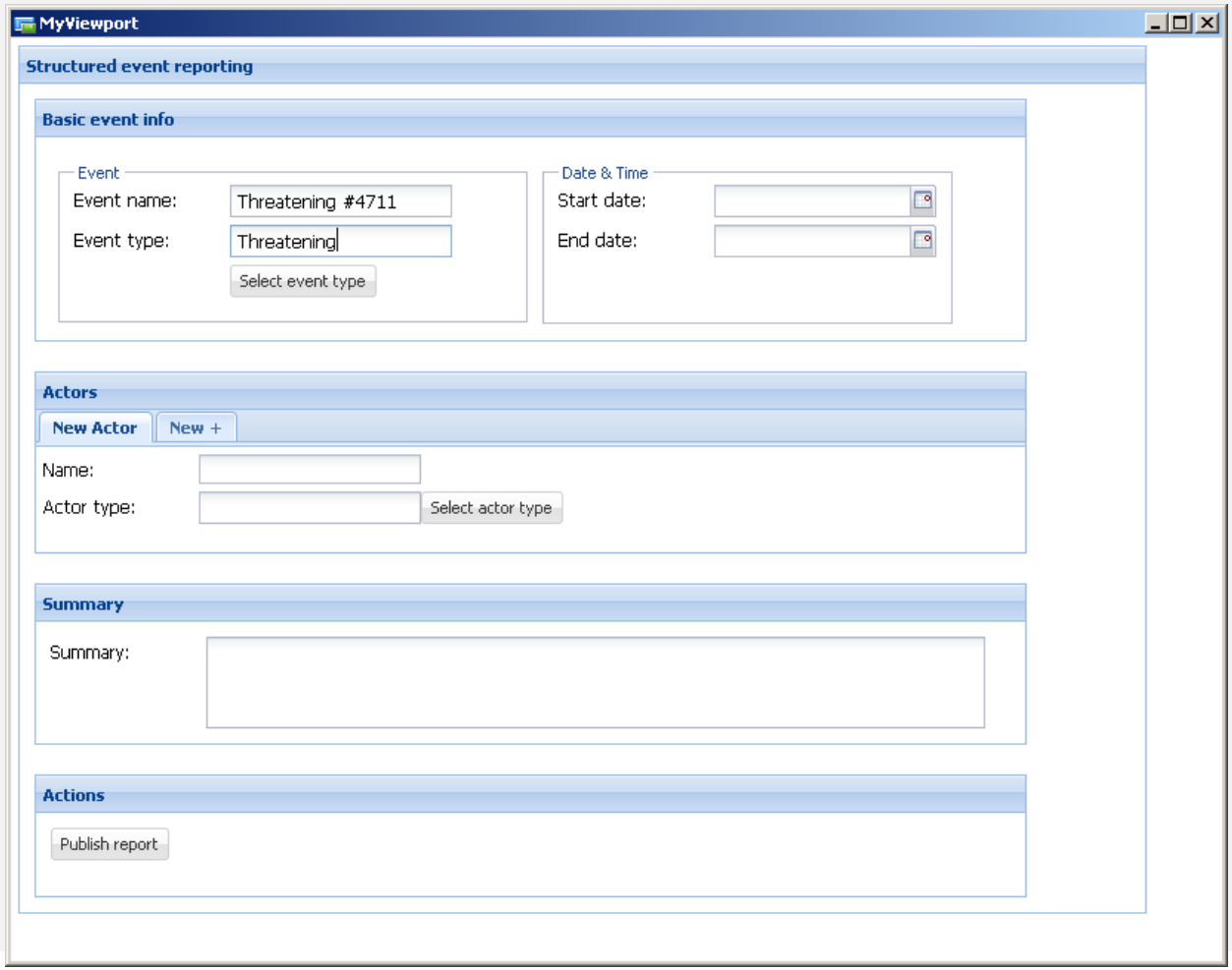
Mock-up


MyViewport
Structured event reporting
Basic event info
Event
Event name:
Threatening #4711
Event type:
Select event type
Date & Time
Start date:
End date:
Actors
New Actor
New +
Name:
Actor type:
Select actor type
Summary
Summary:
Actions
Publish report

Mock-up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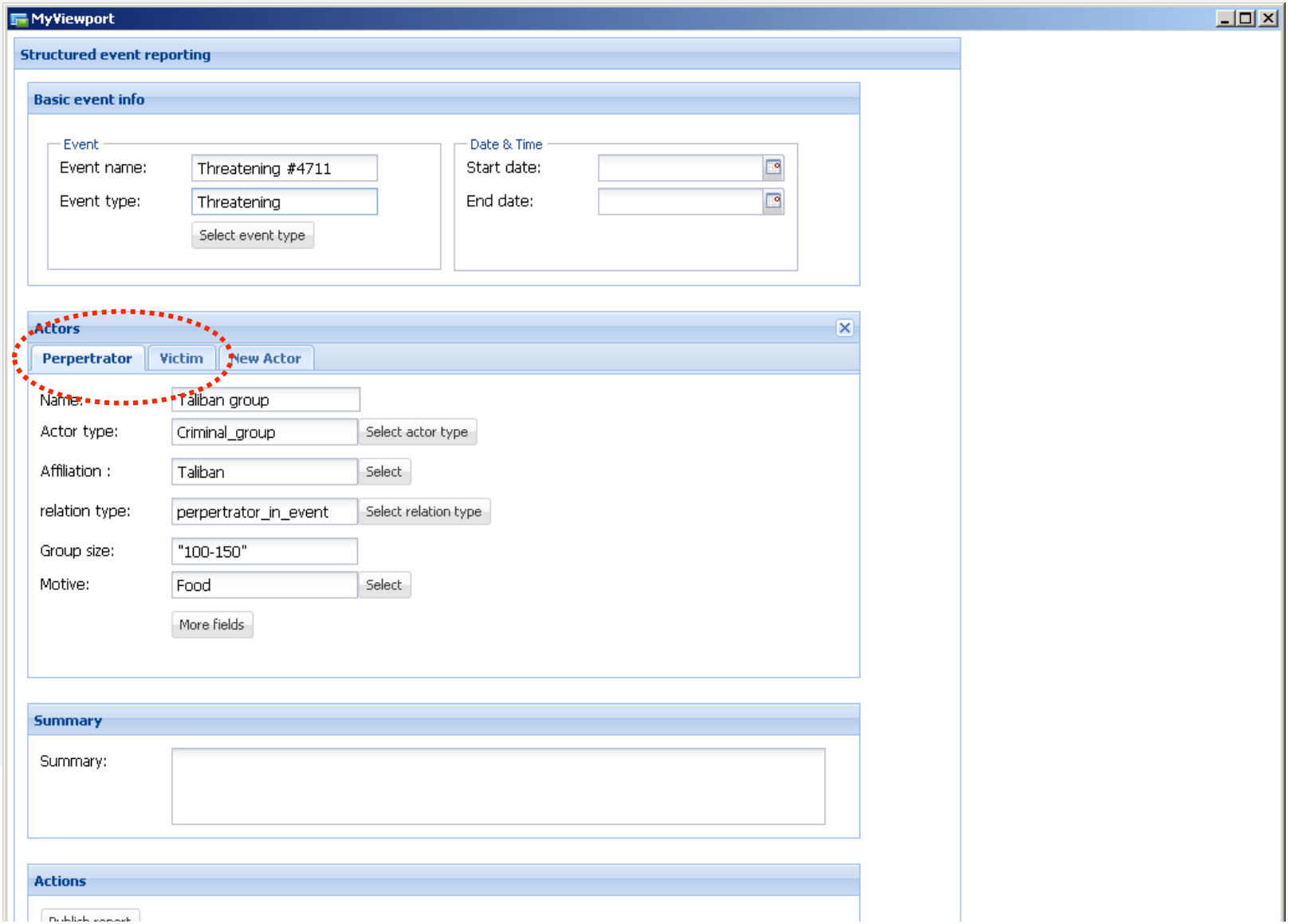
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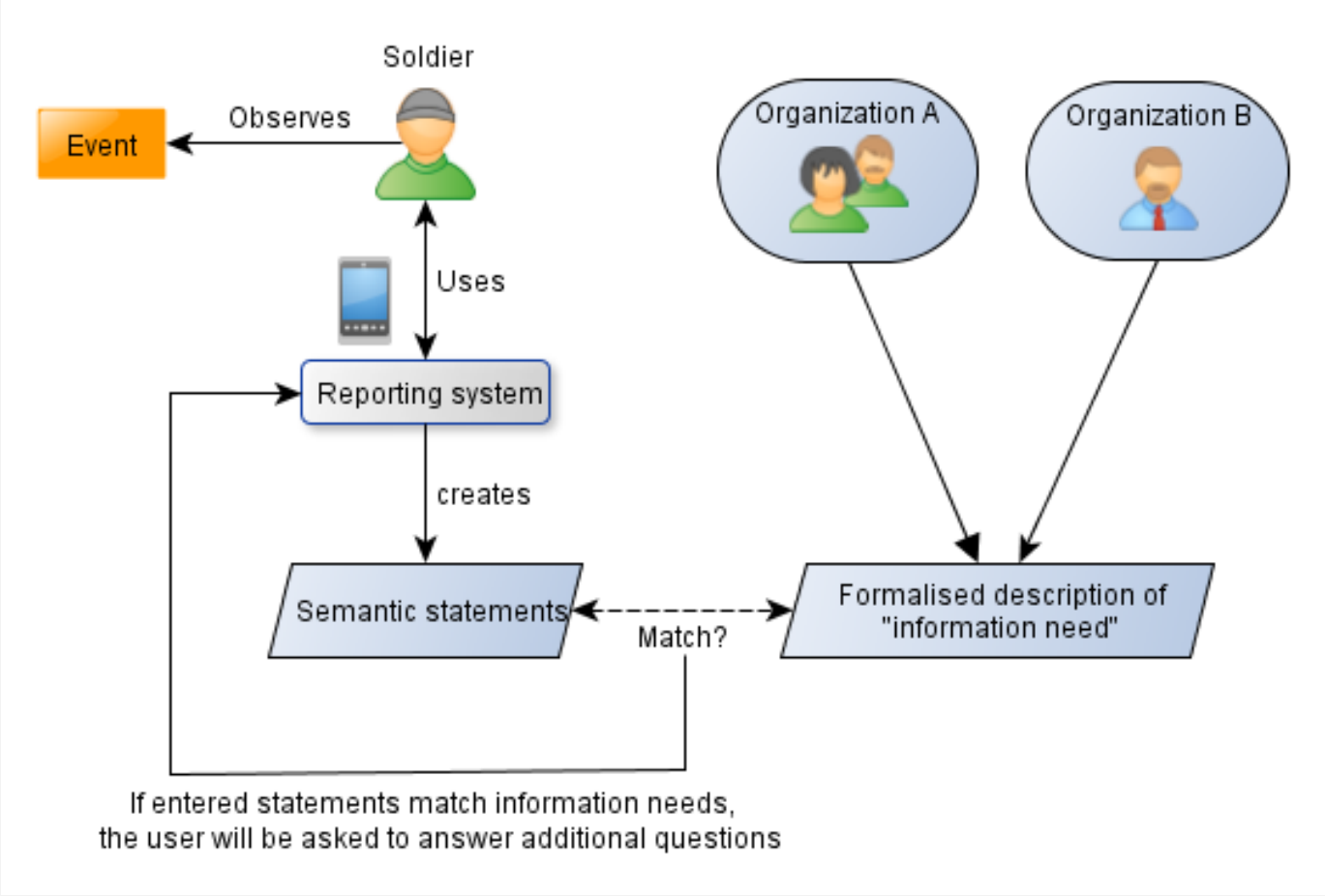
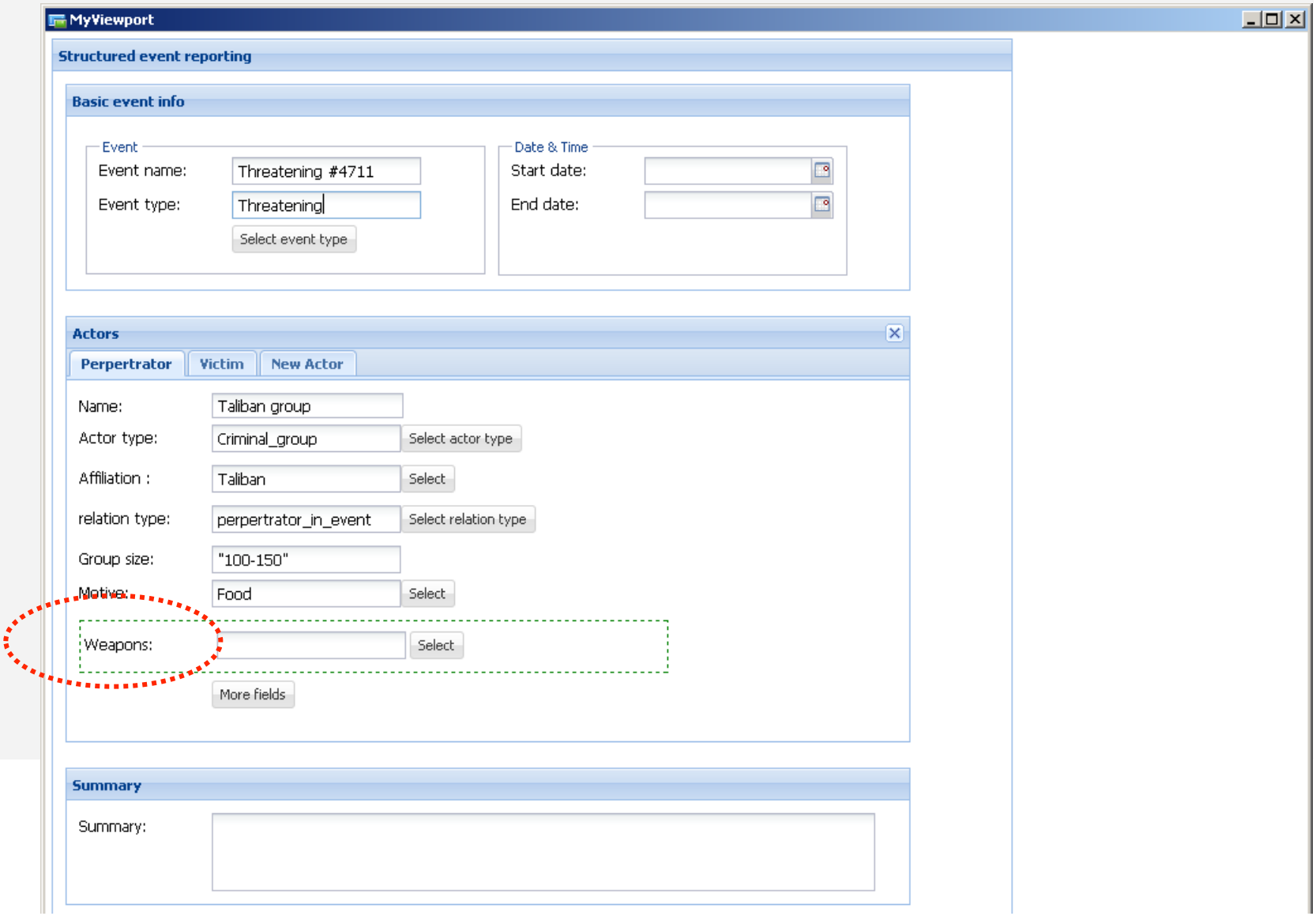
Event type:
Threatening
Select event type
Date & Time
Start date:
End date:
Actors
Perpertrator
Victim
New Actor
Name:
Taliban group
Actor type:
Criminal_group
Select actor type
Affiliation :
Taliban
Select
relation type:
perpertrator_in_event
Select relation type
Group size:
"100-150"
Motive:
Food
Select
More fields
Summary
Summary:
Actions

Matching external information needs



Mock-up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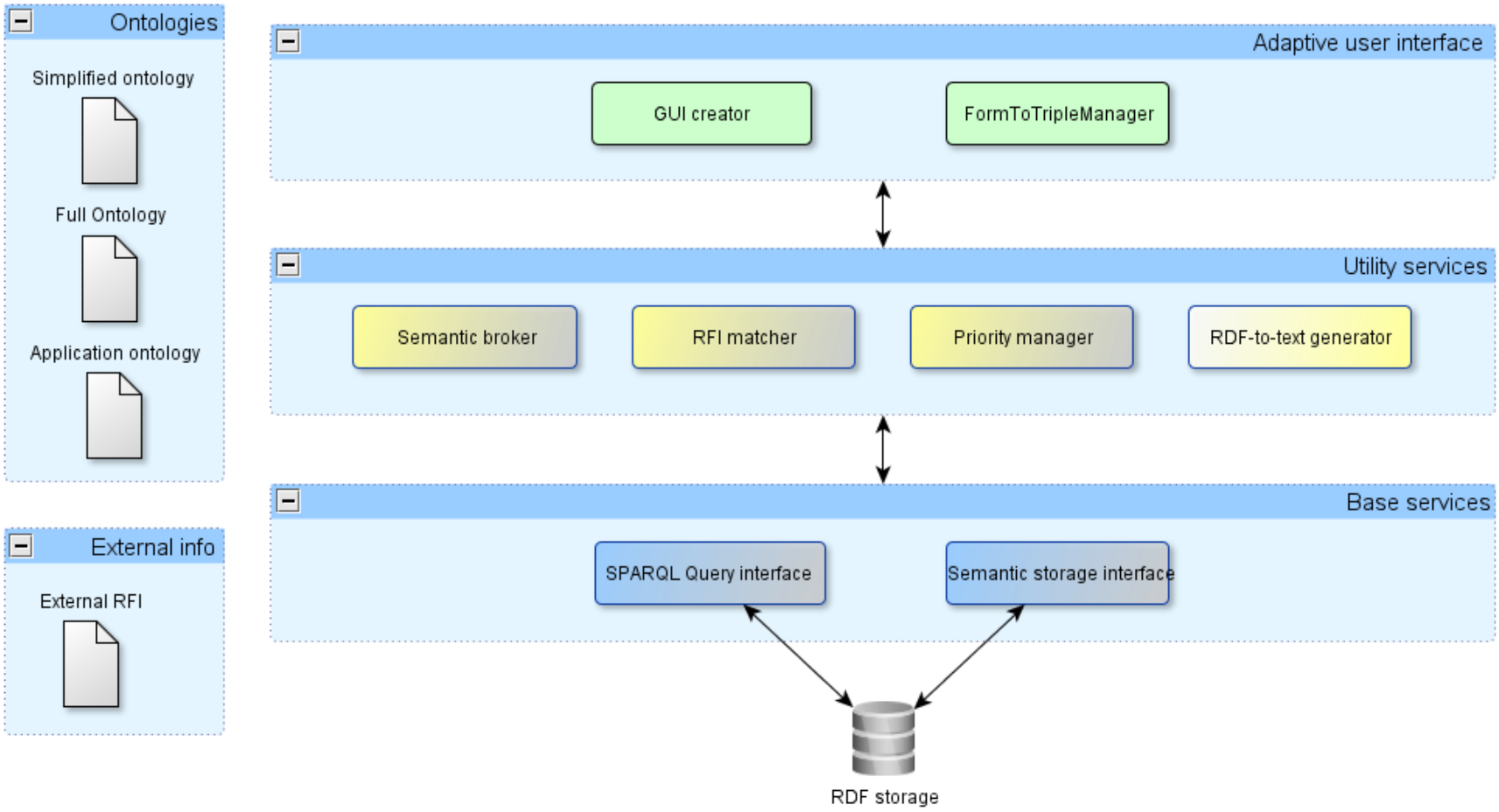
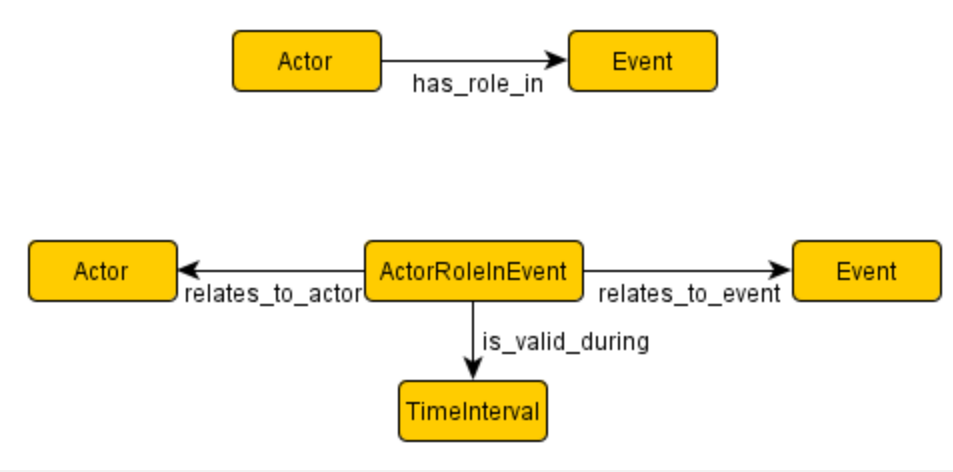
Select
relation type:
perpertrator_in_event
Select relation type
Group size:
"100-150"
Motive:
Food
Select
Weapons:
Select
More fields
Summary
Summary:

System overview



Semantic broker

- Expressive ontologies often use supporting concepts which we want to hide from the user
  - E.g. in order to set attributes on a relationship



- Solutions
  - Simplified ontology + translation
  - Full ontology + GUI-rules

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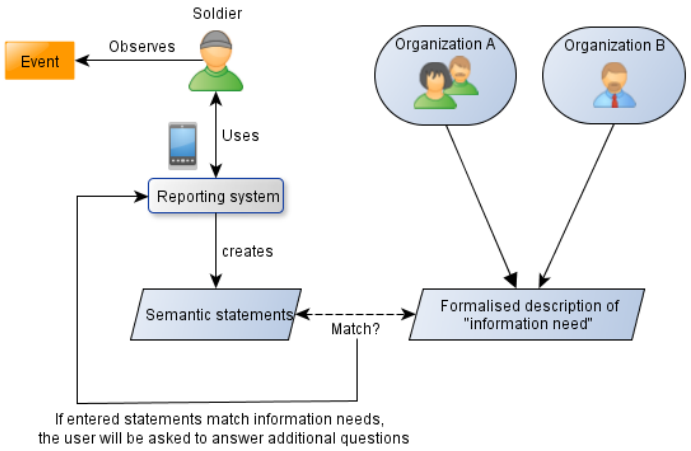
RFI matcher

1. Formalize information need as SPARQL queries
2. Ask for (or prioritize) information that is missing in order to answer query



- Example:
  1. Taliban has_weapon ?x
  2. If ”Taliban” is entered, ask for property has_weapon

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Priority manager

- Prioritize input options based on
  - Ontology (e.g. domain and range)
  - Information needs
  - Context
  - User preferences
  - Social recommendations

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Future work

- Implementation of basic functionality
- Evaluation with users
  - time to enter information,
  - correctness of resulting report
  - completeness of entered information
  - number of RFIs correctly answered
- Study other use-cases
  - Civil security, tool for surveillance personnel?
  - Tagging sensor data

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Questions?

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