An Ontology-based Adaptive Reporting Tool

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“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”
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
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)*
Tool requirements

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

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

Structured event reporting

Basic event info

Event
Event name: Threatening #4711
Event type: Threatening
Select event type

Data & Time
Start date:
End date:

Actors

New Actor
Name:
Actor type:
Select actor type

Summary

Summary:

Actions

Publish report
Mock-up
Matching external information needs

Event → Soldier → Reporting system → Semantic statements → Match?

If entered statements match information needs, the user will be asked to answer additional questions.

Organization A → Formalised description of "information need" → Organization B
Mock-up

Structured event reporting

Basic event info

Event name: Threatening #4711
Event type: Threatening

Date & Time
Start date: 
End date: 

Actors

Perpetrator
Name: Taliban group
Actor type: Criminal_group
Affiliation: Taliban
Relation type: perpetrator_in_event
Group size: “100-150”
Weapon: 

Summary
Summary:
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
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
Priority manager

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

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