Design of a CNL to Involve Domain Experts in Modeling

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Our Objectives Today

• Present to you our efforts to use natural language as a means to involve business users in modeling
• Present to you our experiences while trying these ideas out in the field
  – Typical challenges for business users
  – Their first response to our representation
• Ask your feedback
  – What relevant work/technologies/fields may be helpful to us?
Outline

• Context
  – Who are we and what do we do
• Involving Business Users
• Pattern sentences
• DEMO: Illustration of Practical Experiences
• Challenges/Discussion/Future Work
Be Informed Suite

Services en events
Be Informed Positioning

• Domain characteristics
  – Deterministic (rule based)
  – Decision-oriented

• Typical Ontology Size
  – #Concepts up to 40k

• Kind of Processes
  – Application processing
  – Case management

• Industries
  – Public Sector
  – Financial/Insurance
Our Typical Business User

• Domain Experts, close to the business of our Clients
  – Highly Educated
  – Very Experienced
  – Respected in their Fields

• But
  – No training in Formal Representation
  – Averse to “Technology”
Business User Tasks in Modeling

• Holy Grail: Editing
  – “Single step policy implementation: Business changes its own systems”

• But even more important
  – Reviewing
  – Dissemination/Communication
  – Explaining individual cases
  – Feedback
Business User
Friendly Representation
Business User Friendly Representation
Business User Friendly Representation
Business User Friendly Representation
Business User
Friendly Representation
Be Informed model
Early attempts to incorporate language

• Language-like triples
  – Adding language to relation
  – Concatenation of Multiple Triples
• One of our typical users:
  – “I don’t think that sentence is correct...”

• Editing by parsing triples out of these sentences
• Typical reaction:
  “I keep getting it wrong...”
Early attempts to incorporate language

- Domain Specific Languages
- Many are very syntax oriented
- Typical Reaction: “That’s programming!”
Early lessons learned

• Free typing is not a great editing metaphor
  – Is it freedom if there is more wrong than right?

• Limiting users in the number of ways things must be expressed is a good thing
  – Consistency and quality
  – No need to make choices at every sentence

• Guidelines are needed to avoid ambiguity
  – For instance from SBVR/Rulespeak
Introducing Pattern Sentences

- Sentence Parts mapping to triple types in formal graph
  - Static Text
  - Introduction of concepts (Objects)
  - References to concepts (Subjects)
- Editing operations based on pattern sentences
  - Choosing sentence parts
  - Name an introduced concept
  - Choose an existing concept to refer to
Why Pattern Sentences

• Bridge the gap between formal and natural approach
  – The underlying model is the formal graph
  – The sentences are hand made for comprehensibility
  – Based on best practices in the BR comm. like RuleSpeak

• Based on NLG
  – No parsing: on editing, widgets are NLG-ed in
    • Provides freedom in choosing pattern sentences

• Ability to embed “explanation” inside the pattern
  – Example: next slide
Example

A customer applies for the Triple Play by ordering **all of the products** Digital TV, Fast ADSL and Basic Telephony
Additional Advantages

• Pattern sentences on top of formal graph has other advantages

• Multiple visualisations
  – Visual, tabular, textual

• Multiple languages
  – Translated Patterns

• Multiple target groups
  – Ie. Grammars for different Expert levels
Demo: Textual Policy

In telecommunications, triple play service is a marketing term for the provisioning of two bandwidth-intensive services, high-speed Internet access and television, and a less bandwidth-demanding (but more latency-sensitive) service, telephone, over a single broadband connection. Triple play focuses on a combined business model rather than solving technical issues or a common standard.
Demo: The knowledge model
Demo: The model driven service
Demo: Reviewing based on Natural Language

Discounts

There is a discount group *Consumer Discounts*

There is a discount *Early Adopters* of the discount group *Consumer Discounts* and you can apply for the discount by ordering *Lite ASDL*

There is a discount *TriplePlay* of the discount group *Consumer Discounts* and you can apply for the discount by ordering *Fast ASDL*, *Digital TV* and *Basic Telephony*

There is a discount *Traditional package* of the discount group *Consumer Discounts* and you can apply for the discount by ordering *Analog TV* and *Basic Telephony*
Demo: Business users write rules

Discounts

There is a discount group Consumer Discounts

There is a discount Early Adopters of the discount group Consumer Discounts and you can apply for the discount by ordering Lite ASDL

There is a discount TriplePlay of the discount group Consumer Discounts and you can apply for the discount by ordering Fast ADSL, Digital TV and Basic Telephony

There is a discount Traditional package of the discount group Consumer Discounts and you can apply for the discount by ordering Analog TV and Basic Telephony

There is a product group ________
The product type ________ is part of
The product ________ is a product of the type
There are ________
There is a discount group ________
Demo: Grammar Configuration

Discount [Subject fragment]
- Label: Discount
- Concept type: Discount

Product [Object reference fragment]
- Label: Product
- Concept type: Productinstance
- Single occurrence prefix
- Multiple occurrence prefix
- Link word
- Link word has a leading space
- Last link word: and
- Last link word has a leading space: yes
- Minimum occurrences: 1
- Maximum occurrences (0 is infinite): 0
- Relation type: Requires
- Subject type: Discount

Discount
- New discount
- There is a discount
- Discount of the discountgroup
- Discount of the discountgroup
- Discountgroup and you apply for it
- you apply for it by ordering
- Product
Remaining Challenges

• How to prevent large numbers of patterns
  – Language variations:
    • Inflectional morphology: Plurals,..
  – Other natural languages

• Mathematical Expressions

• Named things vs anonymous things

• Extending/relating CNL’s like we extend/relate meta models
Discussion: What did you see today?
Discussion: An important CNL dimension?
Help needed

• Will this UI work?

• Can you imagine hybrid scenario’s?
  – Based on Patterns
  – NLP for plurals, expressions, conditions

• Other advice?

• Pointers to related work?