A proposal for modular XMCDA

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https://github.com/oliviercailloux/XMCDA-Modular-road

My goal (broadly)

- Improve XMCDA
- Long term goal!
- Compatible with evolutions to come (XMCDA v3)
- This is not a criticism of existing work
- *I*'ll (try to) take care of it
- Comments / Help welcome

Outline

1. My goal
2. Overview
3. Current state
4. Modular XMCDA
5. Implementation

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My goal (more specifically)

- We want to let Web Services (WSs) communicate
- Communication requires standard language
- Common language ≠ constraints specific to WS
- Currently: non standard encoding of specific constraints (diviz-like)
- Not taken into account in your programming language
- SOAP calls allowed, but does not embrace standards
- My goal 1: improve compatibility with standards
- My goal 2: ease development
- My constraint: compatibility with XMCDA

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Example of WSs

WS 1

- I want a non-empty list of alternatives each having a name and a value
- Example input (conceptually) : $\{ ("a1", 3), ("a2", 10), ("blah", 4) \}$
- I provide as an output an ordered list of alternatives
- Example output: $("a2", "blah", "a1")$

WS 2

- Input: an ordered list of alternatives; evaluations for each of these alternatives; a value function
- Output: binary (is the list ranked according to the value function?)

Desired

- In example: Common encoding of “ordered list of alternatives”
- In general: Common encoding of other inputs and outputs: “list of alternatives each having a name and a value”, …
- With low redundancy: only one way of specifying each possible input type
- Common language, but each WS has specific inputs and outputs

Current approach

Common language

- Each WS must accept and produce XMCDA
- Specified with a schema
- Version 3 in preparation
- Improvements done about “low redundancy”

Specificities of WSs

- Not every WS accepts every XMCDA valid input
- Each WS specifies its supplementary constraints in a diviz web descriptor
- Diviz uses this for its user interface
- Developers manually check their input

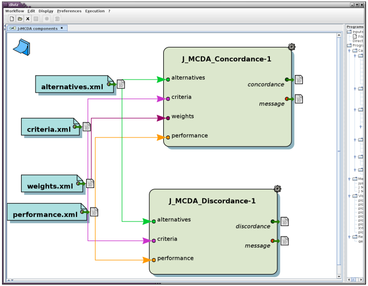
Some details

Common language

- XMCDA schema specifies the grammar of valid XMCDA encoding
- Very permissive (out of necessity): has to accept inputs and outputs that are valid for at least one WS
- Valid iff contains alternatives OR criteria OR value functions OR ...

Specific constraints

- Developer specifies input type
- Through Diviz descriptor (example)



Some details: simplify developers work

Also: simplify developers work

- Diviz framework cuts this input into pieces: alternatives; value functions; …
- Developer programs a WS by simply reading from different inputs (one input per type)

But…

- Tendency to mandate use of library to guarantee constraints satisfaction beyond schema valid files

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Goals: More standard conforming

- Use XML schemas to constrain every WSs
- SOAP calls with schema constrained input
- Automatic discovery of compatible WSs possible
- Automatic invocation and GUI generation possible
- Better integration with enterprise infrastructure
- Decentralisation: provide XMCDA WS with industry standard tools
- Easier interface with existing services (example: solve LP problem)

Goals: Ease developer work

- Give guarantee: input type has been checked against some specific grammar
- Example: I know I receive a list of ...
- Possible to use libraries to transform XML to language specific types

Constraints

- Interface various WSs
- Reuse global encoding standard (XMCDA v2 / v3)
- Compatibility with existing WSs
- As easy to use for non-XML aware developers

Approach

- XMCDA-Modular (XM) Standard provides a set of types
- Called XM types
- Example: set of alternatives, value function, …
- Each WS has a specific schema
- This schema is composed of a list of entries
- Some of them are XM types

Compare to: one schema for every WS

Reuse

- The single types could be borrowed from XMCDA v. x
- Some types could even be made more constrained
- Developer may provide its own type when too specific for deserving being in the standard
- Developers may re-use types from the industry, e.g. LP
- Compatibility with existing WSs: have to develop translators (per type)

Developer POV

- Instead of Diviz descriptor, has to provide a schema
- More difficult!
- Possible to help with tools (to be developed!)
- Possible conversion with Diviz descriptor files
- Leverage existing tools for easy / automatic parsing of input / output

⇒ To be developed as well!

- Provides standard, more general functionality equivalent to existing manually programmed libraries, with support for languages to come

Infrastructure

- Leverage WSDL, language for SOAP WS description
- Provides standard, more general equivalent to Diviz descriptor
- Extend Diviz to account for standard (WSDL) descriptors suppl to Diviz-like

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Implementation

- Course at Dauphine, MIAGE M2
- Some of these students know the prerequisites
- Could be interested in (parts of) this as student projects

Proposed course of action

- You comment
- We discuss
- I (try to) get parts of the idea implemented
- Using XMCDA-Modular schema types to get started
- To be developed progressively!
- I keep you posted
- Possibly: request some resources for online hosting (later!)
- This proposal is compatible with any improvements to the XMCDA schema
- Don't hold your breath!

Thank you for your attention!