A Multifunctional, Interactive DMN Decision Modelling Tool

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Outline

1. DMN
2. IDP & Interactive Consultant
3. DMN-IDP
4. Demo

1 DMN

What is DMN?

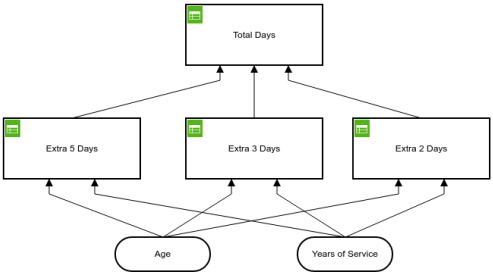
Decision Model and Notation

- Notation standard for decision logic
- Published by OMG Group
- Table-based representation of decisions
- Decision Requirements Diagram
- Main focus: readability, traceability

What is DMN?

Decision Requirements Diagram

- Represents structure of decision model
- Inputs, decision tables, knowledge sources, . . .



Decision Tables

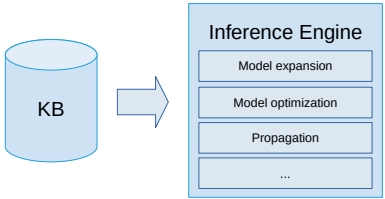
- Decide outputs (blue) based on inputs (green)
- Rows represent rules
- Columns represent values
- Behaviour defined by Hit Policy
- (S-)Feel in inputs

Eligible for 5 extra days			
U	**Age**	**Years of Service**	**Eligible5**
1	< 18	—	Yes
2	$[18, 60]$	≤ 10	No
3	$[18, 60]$	≥ 10	Yes
4	≥ 60	—	Yes

2 IDP & Interactive Consultant

IDP: Interactive Declarative Programming

- Implementation of the Knowledge Base Paradigm
  - Knowledge is stored in a Knowledge Base
  - Inference methods to apply knowledge
  - Goal: clear separation between knowledge and use



IDP

- Knowledge in KB is encoded using FO(·)
  - Extension of First Order Logic
  - Adds types, aggregates, (inductive) definitions and more
- Imperative Lua shell around reasoning engine

Interactive Consultant

- Pierre Carbonnelle, Marc Denecker
- Interactive Consultant is an IDP-based interface
- User-friendly interaction with KB's
- Features:
  - Propagating information in all directions
  - Reasoning on incomplete data
  - Can explain decisions
  - Showing which decisions are irrelevant
  - Optimization of terms

3 DMN-IDP

DMN-IDP

DMN-IDP combines DMN editor and Interactive Consultant:

- The knowledge base is in the form of a DMN model
- User can upload or create DMN models
- Automatic translation to FO(·)
- DMN models become useable in more situations
  - because of propagation and reasoning on incomplete data

DMN-IDP

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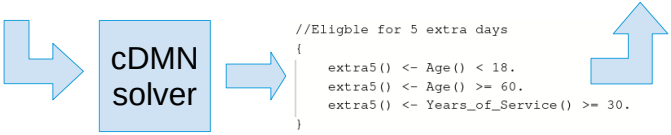

4 Demo

Conclusion

- DMN: user-friendly encoding of knowledge
- Models can be used in multiple ways
- IDP + Interactive Consultant “unlock” these usages by:
  - Reasoning on incomplete data
  - Propagating decisions in all directions
  - Explaining decisions
  - Allowing optimization

Thank you for your attention.

Any questions?

For further questions or discussion:
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Try the tool yourself: https://DMN-IDP.herokuapp.com/

For more information on IDP:
https://dtai.cs.kuleuven.be/software/idp

For more information on Interactive Consultant:
https://idp-z3.be/interactive_consultant.html