

Domain Engineering for Weather Information Services

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WIMEA-ICT

Objectives

- Analyze the weather dissemination domain to identify specific information needs for stakeholders - domain analysis
- Define a Domain Specific Language (DSL) for the weather domain to support development of weather information dissemination products - domain design



Design Objective

- Identify building blocks for DSL
 - Syntax
 - Semantics

Magnolia is an integrated programming and algebraic specification language.



DSL

- Informal - natural language concepts, operations, transformations
- Formal - specification using Magnolia (algebraic)
 - adopt formal notations of domain experts - jargon, use Informal notation of domain as foundation
 - identify types/sorts,
 - operations,
 - axioms



*/** A simple notion of a weather forecast and how it can be updated by new models and meteorological interpretation. */*

concept WeatherForecast = {

*/** Weather forecast data, the forecast being updated as a stream from external sources. */*

type WeatherForecast;

*/** Meteorological know how, typically embodied by a person. */*

type MeteorologicalKnowledge;

*/** Update the weatherforecast from external sources (computers, sensors etc). */*

procedure updateWeatherForecast (upd wf:WeatherForecast);

*/** A human meteorologist interprets the weather forecast and improves its interpretation. */*

procedure interpretWeatherForecast (upd wf:WeatherForecast, obs mk:MeteorologicalKnowledge);

*/** Is the forecast showing a dangerous situation. */*

predicate isDangerous (wf:WeatherForecast);

};



Domain Analysis

- Questionnaires from extensionists and UNMA coded
- Currently looking for how to represent the findings (writeup) as a tech report (to give all further analysis a foundation)
- Paper rejected but good feedback for polishing and sending to the requirements engineering workshop
 - 6th IEEE International Workshop on Empirical Requirements Engineering (focus on process of taking stakeholder feedback into requirements) (<http://munddos.com.br/empire2017/>) as technical paper
 - Submissions due: June 9, 2017
 - Notifications to authors: June 30, 2017
 - Camera-ready copy of accepted papers: July 16, 2017



Domain Analysis Objective

- Paper to Africon retracted, being polished to target journal
 - Showing the linkage between the data and actual dissemination to the end user (stakeholder)



Next Steps

- Address feedback from domain exploration paper and resubmit
- Complete and submit dissemination domain decomposition paper
- Build and refine DSL by filling in gaps - e.g.,
 - How does agricultural agency determine which seeds to distribute?
 - How accurate are seasonal forecast advisories?
 - To what extent do farmers in other parts of East Africa get agricultural advisories, how do they make decisions?
 - Look at past seasonal forecasts and translations to establish how forecasts are written and translated (so as to support automatic translation)



Thank you! Comments, suggestions, questions, reactions?

