

Interactive comment on “The architecture and prototype implementation of the Model Environment system” by G. Donchyts et al.

G. Donchyts et al.

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Thank you very much for your review. Please see the answers to all the questions below.

Q: The number and quality of references is not appropriate. I do not think that Wikipedia links are acceptable.

A: There were no comments given from the editor regarding Wikipedia references during the article acceptance process. The Wikipedia links were given to make an easy to read and understand presentation of the software concepts from the paper. Links to the referred sources on the topics can be found in the bottom of each provided Wikipedia URL. We list here the most important links: Software Frameworks (Gachet 2003, Johnson 1999), Model-View-Controller pattern (Fowler, 2002), Object Relational

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Mapping (King, 2004).

Q: Existing model environments (e.g. Leavesley et al., 2002) are not discussed.

A: There are many model environments available nowadays and it is out of scope of the article to provide an overview of them (see Gachet 2003, Johnson 1999). Instead the paper is more concentrated on the two main aspects:

1) how to describe model data in such a system, see Chapter 3 "Data and metadata (common library)" of the paper.

2) what is the general structure of the system and how models are integrated (Fig 1, Fig 5).

The first concept is very interesting and was already discussed in number of standards and systems such as OpenMI, ArcHydro and other ESRI data models, ESMF, DUTCH-OMS, LIANA Model Integration System, Modular Modeling System (MMS) etc. (Maidment 2002, Killeen et al. 2006, Gofman 2005, Leavesley et al. 1996, 2002).

Q: The description of the system architecture is insufficient. "A plug-in is a library which can be easily embedded into the system only by putting it into the specific folder." This is not a satisfactory description of the coupling of different modules.

A: The aim of the sentence was to put attention of the reader to use Plug-in pattern. Model coupling is done once a "Model Environment wrapper" is created around a computational kernel; in other words once a model can communicate in a defined common language. No detailed description on how to create a wrapper is given to fit the limited size of the paper. The sketch of the model wrapping idea is presented on the Fig 5.

Q: Even the figures presented do not give an overview of the system architecture.

A: The Fig 1 presents the main blocks of the system to clearly show separation of entities and information flow between them (UI should not ask DB directly for the data, only through the Core). Again, no detailed UML diagram of classes is given a) not to

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overload a hydrologist reader with Computer Science terms and b) to fit the size of the paper. The paper is more concentrated on object-oriented analysis and identification of the main system entities required to describe model data and manage model engines.

Q: The cited (not presented!) application ("Decisions Support System for Nuclear Emergency Management") is out of the scope of HESS. In its present form the paper is definitely not publishable. Especially without any sample application that lies within the scope of HESS and demonstrates the benefits of the modelling system discussed.

A: The authors of the paper are definite that the cited application "Decisions Support System for Nuclear Emergency Management" is within a scope of HESS since one of its main parts is a collection of hydrological models, which is explicitly mentioned in the (Raskob et al., 2004) from the current version of the paper.

The evaluation of the radiological consequences of accidental releases of radionuclides from various sites demonstrated a significant contribution from the contaminated waterbodies to the water quality. This was clearly shown, e.g., for the Clinch River-Tennessee River basin - releases from Oak Ridge, for the Techa River / Ob River watershed - releases from "Mayak", for the Dnieper river basin, and for the population in the vicinity of Scandinavian lakes - Chernobyl accident.

The realization of a Hydrological Dispersion Module (HDM) inside the RODOS system (real-time on-line decision support) for nuclear emergency management in Europe has been started (Heling at al. 1997, Raskob at al. 1996, Zheleznyak at al. 1993, 1996, Margvelashvili et al. 1997). HDM is developed at the NRG -KEMA, the Netherlands; FZK Karlsruhe, Germany; IMMSP, Kiev, Ukraine; TYPHOON, Obninsk, Russia; IPEP, Minsk, Belorussia, NTSC Democritos, Athens, Greece. The testing customization work is doing by the NPPRI, Slovakia. The work on the module development and customisation is sponsored by the Commission of the European Communities within its Radiation Protection Research Programme in the projects "Customisation and further development of RODOS for operational use" (RODOS-B) and "Enhancement of

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the EU Decision Support System RODOS and its Customisation for Use in Eastern Europe (Inco-Copernicus project RODOS-E)".

The models from the RODOS HDM were tested within several intermodel contests on radionuclide transport in water bodies (Monte et al. 2006a, 2006b).

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