Software requirements for Joint FCERM R&D Programme modelling outputs and architecture specification for RASP family outputs

Technical Summary: FD2121

Joint Defra / EA Flood and Coastal Erosion Risk Management R&D Programme

Background to R&D project

The joint Defra / Environment Agency FCERM R&D programme has and will continue to deliver a considerable number of software products to the Environment Agency. Some of these will be operational or planning tools which will be mounted on Agency systems, such tools need to conform to Environment Agency IT data exchange and protocols and go through testing and acceptance procedures. Currently there is no single source of documentation to inform suppliers about the Agency's basic requirements. As a consequence software implementation is slow and extremely resource intensive, the benefits of training are frequently lost due to delays in implementation.

The Joint programme is currently developing a number of inter-related tools which adds an element of complication to the existing situation, for example the RASP (Risk Assessment for System Planning) family of tools. For efficient development and support these should be designed so as to use common modules wherever possible, within an open software architecture. This approach allows the Agency to be flexible when developing tools and it leaves the door open to innovative thinking.

The objectives of this research project were:

Objective 1: To draw up and agree with Environment Agency IT specialists a common set of requirements covering standards on enterprise architecture and related issues, potentially applicable to all software outputs of the joint R&D programme, in order to permit fair tendering and the efficient production of conforming software.

Objective 2: To draw up for the RASP family an initial overall system architecture which will identify and specify common modules. This was based on the work carried by the RASP Scoping study (SC050065) and will be developed further under MDSF2 (SC050051) project.

Results of R&D project

Based on Environment Agency technical reference documents this project has produced a guidance document, presented as R&D Technical Report FD2121/TR2 'R&D Software Development Projects – Guidance for Research Contractors'. The guide sets out the requirements for the R&D contractor to produce Agency compatible software and, importantly, will foster early and informed discussions between the R&D contractor and the EA's Corporate Information Services (CIS). This important and accessible guidance will, when followed, will help improve take

up of R&D software outputs. This is however only one element in improving the take up of the software outputs of high-quality and appropriate research - on-going dialogue and planning will be required, throughout the development life cycle, involving the research contractor, CIS and Agency/Defra managers.

The utility of the guidance has been demonstrated through trial applications on a range of software. The development of the guidance has highlighted a number of areas which could be addressed by improvements to the EA's Enterprise Architecture: Technical Reference Model and other process documentation, including: the need for more guidance on .NET, the need to facilitate end user involvement in the development stage, improved documentation requirements, and the need for early consideration of future custodianship, support, maintenance and user training.

The requirements and methods for the RASP family of tools continue to be developed and currently are not sufficiently well defined to enable a comprehensive and appropriate conceptual/logical architecture for the RASP family to be fully identified. However useful steps towards an appropriate architecture have been made in the project covering: an architectural review of ongoing RASP-related projects, currently identifiable common modules and appropriate enabling technologies. The review has shown that the tools are being designed to share common data and some common computational modules. Further action would be beneficial in the areas of defining requirements, analysing commonalities and further specification of software architecture to better achieve the objectives of facilitating the efficient production of sustainable and appropriate software tools and to facilitate competition. As requirements and methods continue to evolve it will be important to review architectural aspects and maintain an on-going dialogue with CIS and other stakeholders to facilitate take up of the software outputs.

R&D Outputs and their Use

The two technical reports listed below provide the outputs of the project. TR1 provides background material on the Guidance and covers the preliminary architectural review of the RASP family. TR2 provides the Guidance material itself and is expected to be used by research contractors involved in software development under the joint R&D programme.