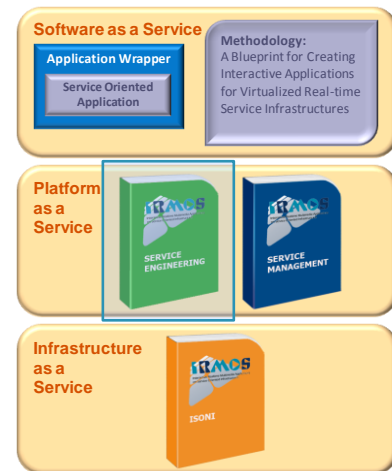


## Service Engineering Tools

Determining resource provisioning policies for applications in cloud computing environments is a significant challenge. The novel IRMOS PaaS architecture targets real-time Quality of Service (QoS) guarantees for online interactive multimedia applications, considering the full service lifecycle including both Service Engineering and Service Management. The IRMOS QoS-oriented Service Engineering tools support two important features: (i) Real-Time Specification, addressing the representation of an application within the PaaS architecture and (ii) Event Prediction, addressing the procedures and mechanisms needed to model an application and determine the appropriate infrastructure requirements.



### Key Features

- *UML-based environment (Papyrus) for application performance modelling and service design.* In particular the *MARTE UML Profile* and *UML Profile For Modelling QoS And Fault Tolerance Characteristics And Mechanisms* are used.
- *Business value driven optimisation strategy* based on resource estimation techniques exploiting queuing networks and discrete event simulations.
- *Benchmarking techniques* and *Artificial Neural Networks* to capture the mapping rules from high level application component QoS parameters to resource requirements.
- *Performance control loop* between service engineering and service management for event monitoring and runtime adaptation of resource provisioning policies.

### Building Blocks

- *IRMOS UML design tool:* Papyrus UML tool including the MARTE profile and a profile for modelling IRMOS Applications.
- *Business Performance Management:* provides strategic decision support and allows an Application Provider to define and assess their business goals (e.g. profitability).
- *Optimisation Engine:* uses the performance models and business constraints in order to optimise the choice of resources to satisfy the application QoS constraints and business goals.
- *Performance Estimation Service:* provides (amongst other functionalities) an interface for the Application Providers to manage their application performance models and simulators.
- *Performance Feedback Service:* helps improve the accuracy of predictions and allows for feedback and learning.

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Further information: <http://www.irmosproject.eu>

