



ROMULUS

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At a Glance

Project title

Domain Driven Design and Mashup Oriented Development based on Open Source Java Metaframework for Pragmatic, Reliable and Secure Web Development.

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Total cost / EC contribution

3,111,670 € / 2,214,946 €

Start date /end date

January 2008 / December 2009

Scope

Web Software Development is one of the most active areas in software development in Europe, and Java Enterprise Edition is the preferred option for one million developers. Web development is not yet a mature area, characterised by many technologies and frameworks. Developers are not able to master all these technologies, which affects seriously to their productivity.

Romulus project provides a complete suite based on a new open paradigm for developing web systems with Java technologies. The core of this suite is Roma Framework, focused on improving the Java Web Applications development processes by following a domain driven design approach. The Romulus suite includes utilities interoperating with the framework and covering all the Web development aspects.

Advances

While many times, developers focused on the details of the technologies they use, Romulus focuses on domain engineering, delegating to a metaframework and making use of code generation techniques for generating most of the web applications from this domain model.

Roma MetaFramework – as the core part of the Romulus suite – provides the main functionalities of common Web. It is based on an extensible plug-in architecture that allows developers to include new modules using a metaframework syntax in an aspect oriented way. These modules implement the different aspects of Java Web application like persistence, view, services, users, workflow, reporting, etc. Besides, Romulus speeds up the web application development through the reuse of existing services and components. Applications are exposed as services, allowing developers to extend their applications through mashups with external services, enterprise systems, data sources or portal components such as:

- Data-level mashups. Applications created by Roma can be easily integrated within DERI pipes and Sig.ma semantic tools thanks to the module for RDF generation.
- Portal mashups. Integration with Liferay portal allows to access some portal functionalities from other platforms (Facebook and Netvibes) and provide the ability to build new applications combining specific parts of already existent applications.
- Web services mashups. Applications are integrated in MyCocktail -the Romulus Mashup Builder- through services. The developer can extend his application with mashups in a graphical way.
- Enterprise mashups. The developed components allow users to extend the generated applications within external Enterprise applications thanks to its OpenESB integration.

The Romulus suite is completed with **IDE4Romulus** -plug-in for create Roma applications within integrated development environments-,

ATP4Romulus -tool for automatic tests of the applications generated using the Roma framework- and **Wapiti** -black-box testing tool for assessing the security in the generated web applications-.

Positioning in global context

The impact of Romulus in European software and services development is based on the fact that most software and services are developed in Java Enterprise Edition in Europe.

Romulus improves productivity in Java Web Development. Due to the impact of software in the economy, reducing the cost of software development and improving software quality are important economic objectives in Europe. In addition, Romulus is delivered as an Open Source project, which promotes cost reduction and improvement of innovation. Romulus is carrying out an active dissemination in open source communities (Roma Metaframework, Liferay and OWASP).

Contribution to standardization and interoperability issues

- W3C Semantic Web Deployment WG: assists users in publishing data and vocabularies describing data.
- W3C RDB2RDF WG: a language for mapping relational data and schemas into RDF and OWL.



Target users / sectors in business and society

Romulus helps Applications providers to build Java web applications in a more productive, reliable and secure way. The targeted end-users of Romulus are developers. The Romulus is a complete suite of development tools which cover the whole development cycle in order to accomplish these objectives.

Overall Benefits for business and society

The advantages of Romulus technologies, comparing with conventional Java Web Development tools, are:

- Investment saving: Applications are finally portable across tools and frameworks because business

code and model does not contain any references to them.

- Huge improvement of productivity: Saving at least 50% of effort in comparison to conventional Model-View-Controller approaches and up to 80% for applications doing many database persistence operations.
- Average skills required is lower than for conventional frameworks. Developers have to write less code, making maintenance and testing easier.

Examples of use cases

To show the applicability of Romulus' technologies in real contexts and demonstrators are provided:

- The European Projects Manager demo is a complete application that is able to manage the costs and the information of European FP7 research projects. Once all information of each project is completed, the project coordinator will be able to make a costs report to send it to the NEF application of the European Commission.
- Cornelius is an application that allows managing projects, company's employees and their hours-worked over projects activities. Its user policy is based on different profiles thanks to the security annotations included in Roma Framework.
- Scrooge is an application for personal financial management. This Rich-Client application has been created by using the Janus wizard. Scrooge allows users to categorize their own expenses and compare them with similar users.

Achievements

Main software products developed within Romulus:

- Roma Meta Framework, core part of the Romulus suite, provides the main functionalities of common Web applications. [<http://www.romaframework.org/download.htm>]
- IDE4Romulus, NetBeans and Eclipse plugins which provides IDE integration facilities to Roma. [<http://www.ict-romulus.eu/web/ide4romulus>]
- MyCocktail, web application with a graphical user interface for building mashup, it allows to extend Roma applications with mashups. [<http://www.ict-romulus.eu/web/mycocktail/download>]
- ESB4Romulus, Roma Enterprise module allows the exposition of web services defined in Roma over ESB. [<http://www.ict-romulus.eu/web/esb4romulus>]
- Wapiti, an application for auditing the security of web applications. [<http://www.ict-romulus.eu/web/wapiti/download>]
- ATP4Romulus is a tool for the test case generation for the Romulus Framework. [<https://ict-romulus.svn.sourceforge.net/svnroot/ict-romulus/trunk/testing/ATP4Romulus-v03>]
- The complete list can be found at [<http://www.ict-romulus.eu/web/romulus/community/downloads>]