

# Advanced Issue Tracker in Smalltalk

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## Abstract

The system demonstrated is an advanced open source issue tracker built using Smalltalk, the continuation based web framework Seaside and an OODB called Magma.

These unorthodox components enabled an uncompromised object oriented implementation and very fast development. The demonstration presents the system, its design, project experiences and the development environment used.

### Categories and Subject Descriptors

D.1.5 [Programming techniques]: Object-oriented Programming

D.2.6 [Software Engineering]: Programming Environments – *Integrated environments, Interactive environments*

D.2.9 [Software Engineering]: Management – *Programming teams*

D.3.2 [Programming languages]: Language Classifications – *Smalltalk*

H.2.4 [Database Management]: Systems – *Object-oriented databases*

H.4.1 [Information Systems Applications]: Office Automation – *Workflow management*

J.1 [Administrative Data Processing]: Manufacturing

K.6.3: [Management of Computing and Information Systems]: Software Management – *Software development, Software maintenance*

K.6.4: [Management of Computing and Information Systems]: System Management – *Quality assurance*

**General Terms** Documentation, Performance, Design, Languages

**Keywords** Issue tracker, continuations, Ajax, bugs, ODBMS, Smalltalk, forms, workflow

## 1. Description

The demonstration presents an advanced web based issue tracker designed to be simple to use but with a very high degree of tailorability for multiple interconnected issue processes.

The system was built in six months by two developers of which one had never worked in Smalltalk before. The chosen tools enabled a pure object oriented design from the user interface all the way down to the domain model.

The demonstration will show a simple but "smart" web user interface using Ajax and the continuations based web framework Seaside. It includes graphical display of workflow and a dynamic custom forms engine.

Other noteworthy features are the validation model for the forms which restricts movements in the workflow graph instead of preventing the user from entering data, a very sophisticated filtering and notifications model, full offline capability with automatic synchronization and conflict detection and an embedded editable contextual wiki help.

The development environment will also be shown and some interesting ideas in the implementation will be explained, like for example the consistent use of the "Command" pattern in the domain model facilitating complete history and offline operation with synchronization.

Challenges during the project included supporting the complex requirements regarding customization, constructing the meta model and execution engine for the forms based user interface and efficiently implementing the filtering and notification model.

To ensure robustness unit testing has been used in combination with an OODB simulation layer in order to run tests fast in RAM. The system has approximately 300 classes, half defining the persistent domain model, and about 20000 lines of code.

The project was published as open source (BSD license) in august 2006 and named "Gjallar". Time will tell if it will attract more developers and users.

## 2. Biography

Göran Krampe has been programming since he was 12 years old and studied computer science at the Royal Institute of Technology in Stockholm until he dropped out in 1995.

Since then he has worked as a consultant in object oriented systems development, participated in all kinds of projects ranging from newspaper production systems, in-house web applications and optimization software. He has also taught object orientation and likes to hold seminars or presentations.

The last 8 years Göran has been actively contributing to the open source Smalltalk implementation called Squeak. Smalltalk, open source and Linux are his main interests today.