synectique
Inventive Analysis

Inventive Toolkit for 4D

Dedicated Tools for Software Business Intelligence

www.synectique.eu

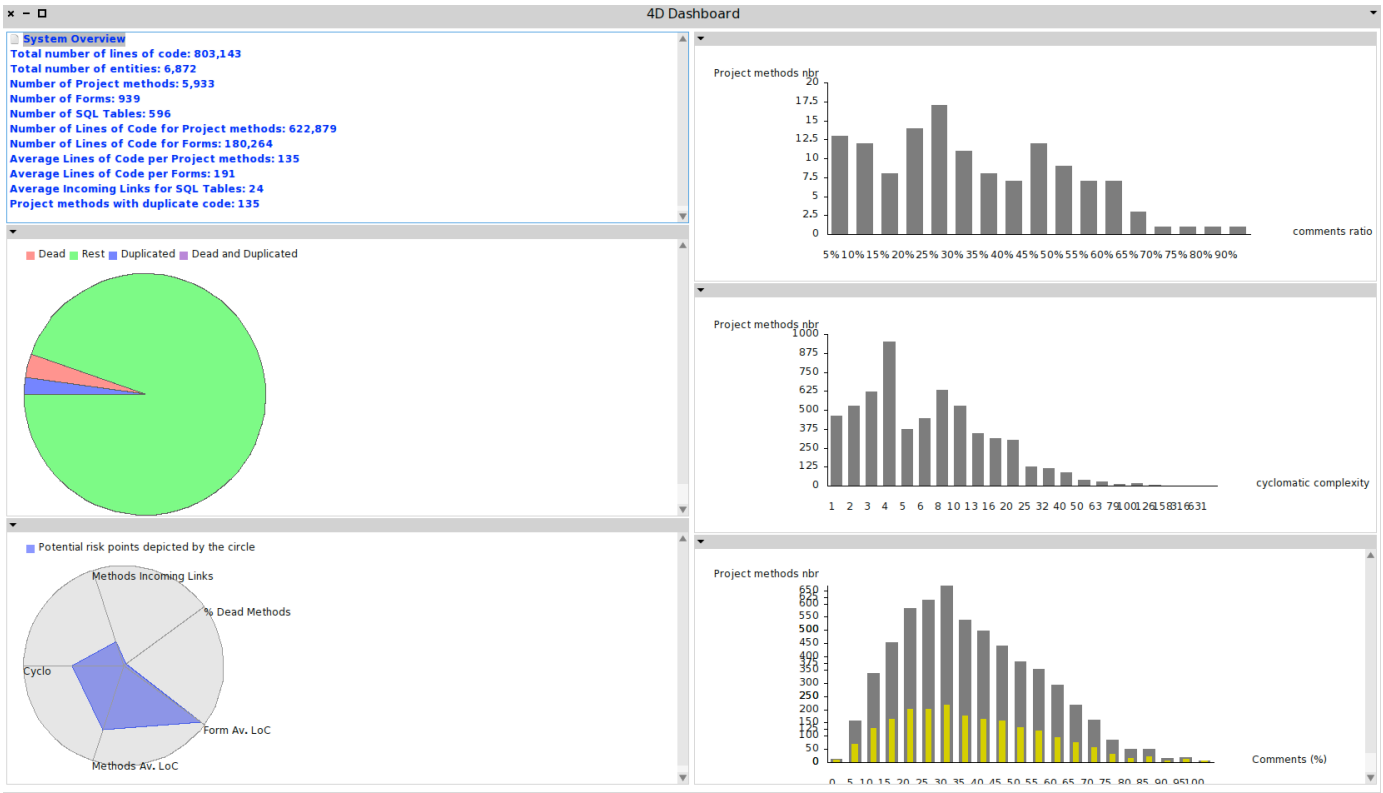
Dedicated Analysis Tools for 4D

Salient Features

- Metrics and Analysis for Tables, Project Methods, Form, Form Methods
- Duplication Detection
- Dead Code Analysis
- Change Impact Analysis
- Metrics: Cyclomatic Complexity, Code Reusability, Duplicated and Dead Code
- Dynamic Execution of Forms
- Embedded SQL Queries and Cross References for Tables and other Entities
- Commented Code and Comments in Code
- Reports
- Trends of Metrics
- Customized Tools

Dedicated Analysis Tools for 4D

The Dashboard



Inventive Toolkit's Dashboard provides high-level metrics and charts to understand the overall state of your code. The available information include:

- Code metrics for Project Methods, Forms, Tables, and Form Objects
- Metrics for code duplication
- Metrics for incoming and outgoing links to 4D entities
- Cyclomatic complexity for Project Methods
- Identification of dead code
- PDF reports

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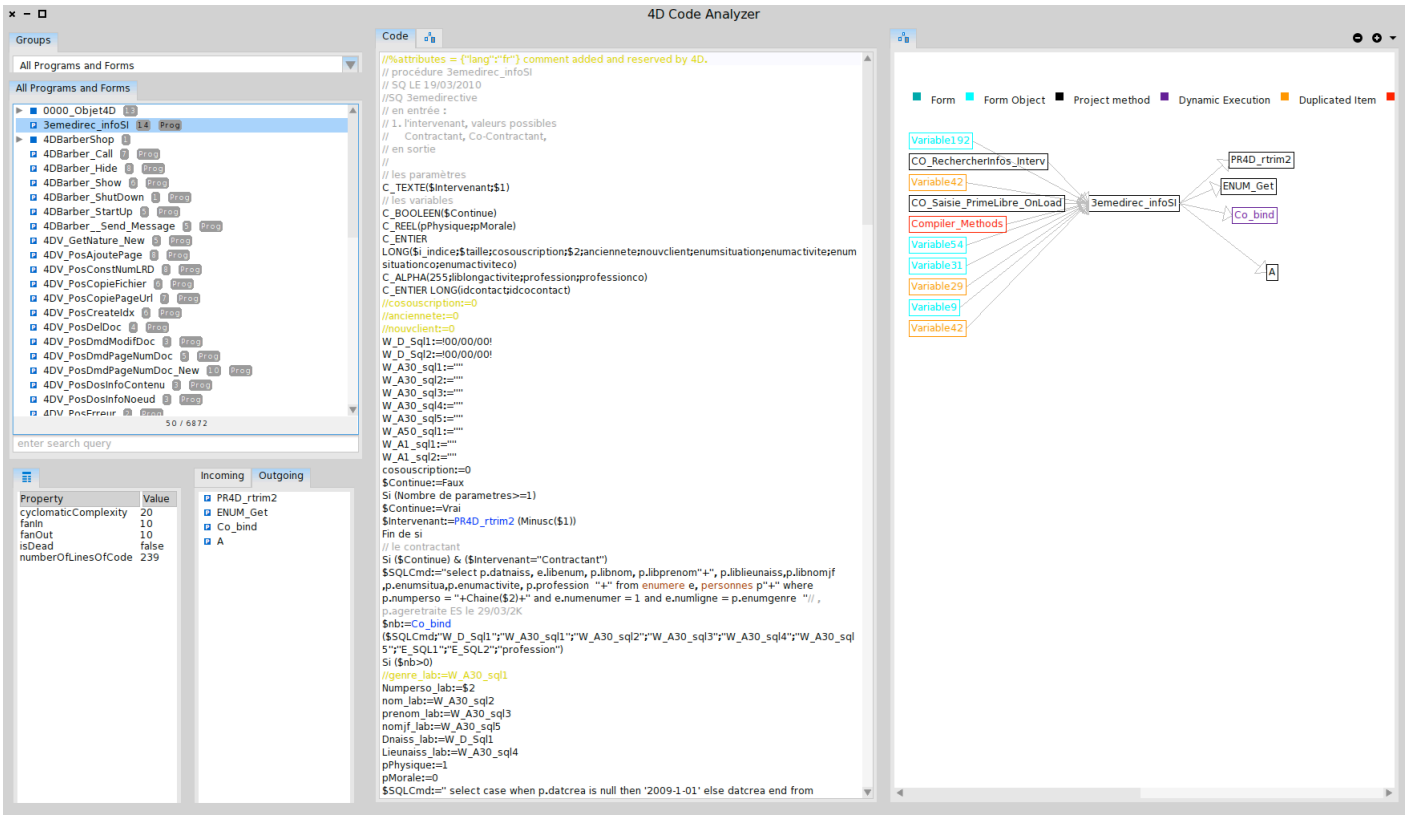
The Code Analyzer



The Code Analyzer is a dedicated environment to analyze detailed characteristics of 4D entities. Whereas the dashboard enables understanding the entire system, Code Analyzer provides detailed insight regarding a specific entity. Code Analyzer is an augmented code browser that is enriched with a code highlighter for important concepts, visualizations and metrics. It consists of several panes, and each pane concentrates on a particular characteristic of the entity selected for analysis.

Augmented code browser: Shows the code associated with the entity, highlights important concepts in the code, such as dynamic calls, duplicated code and comments.

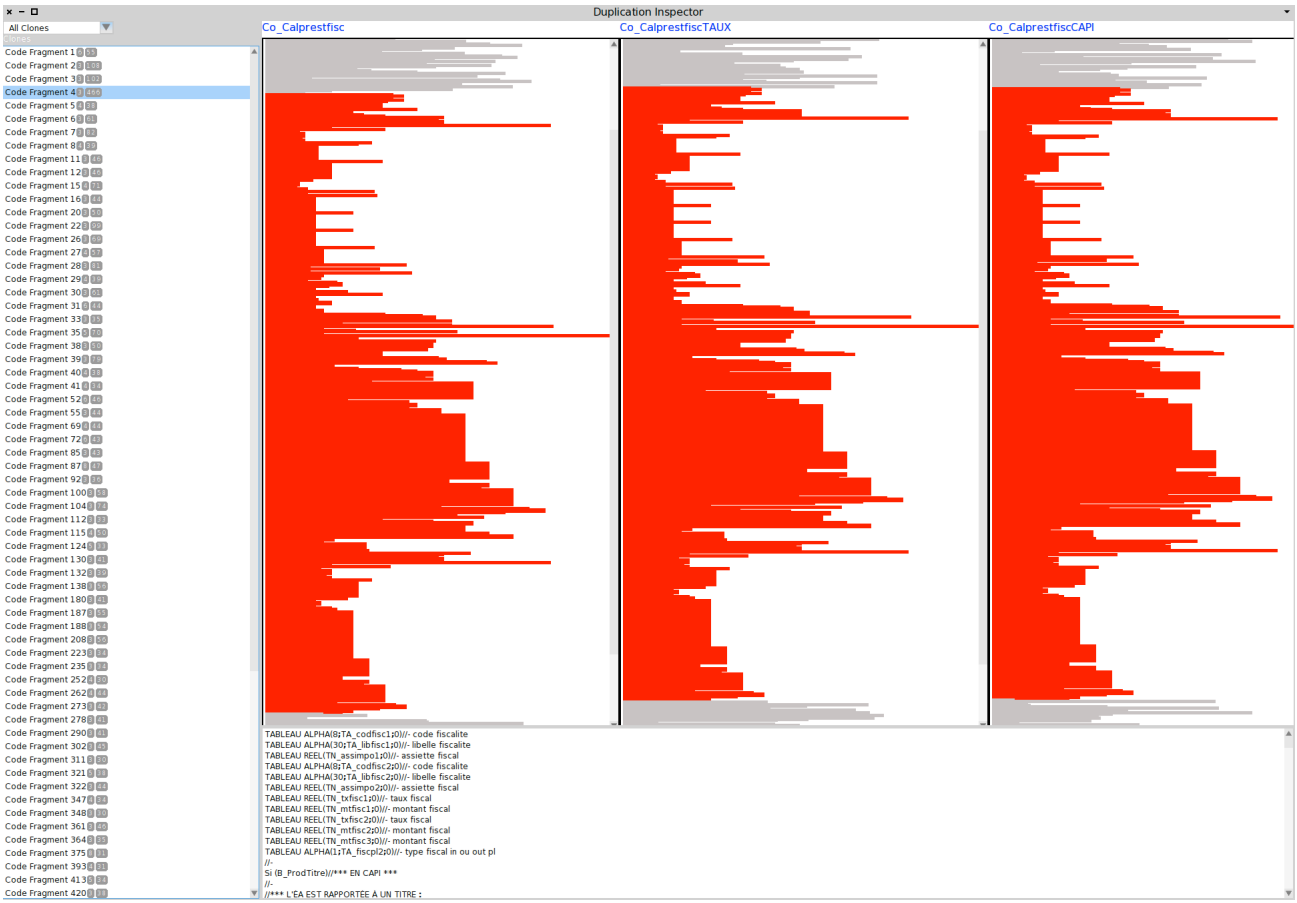
Search/Filter: Annotated list of 4D entities with searching and filtering facility (e.g. all entities with duplicated code)

Metrics: Cyclomatic complexity, number of links to outside entities, number of lines of code

Dependencies: A list of callee and caller entities. For example, for a table, all project methods or forms that call the table are shown in the list of incoming links.

Visualization pane: A graph showing dependencies of the selected entity.

The Duplication Inspector



The Duplication Inspector is a tool to detect duplicated code in a 4D system. All duplicated fragments in the system are shown in a list. A duplicate code fragment can be analyzed through a dedicated visualization that shows its location in each entity. To facilitate the analysis, the actual code of the duplicated fragment is displayed so that the user can judge whether it is to be removed or not.

The duplication detection can be launched with the new parameters or on a subset of entities.

The tool also permits annotating duplicated fragments and creating reports for discussion with other developers.

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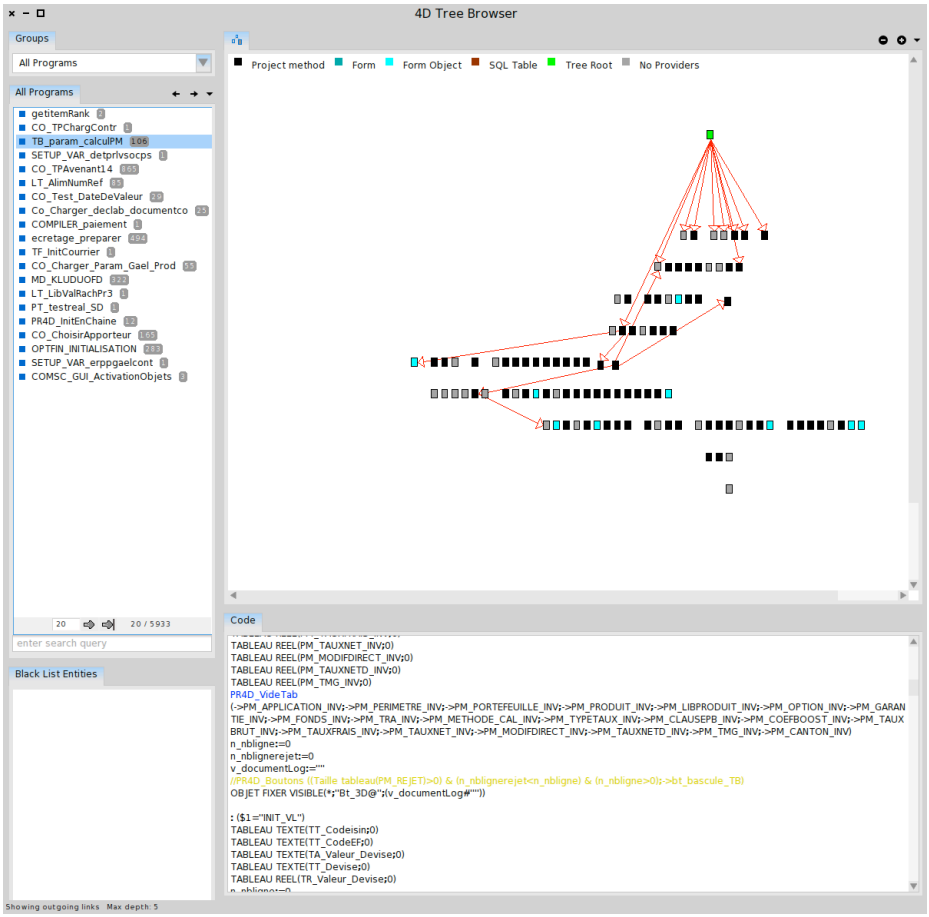
The Impact Analyzer



The Impact Analyzer allows you to understand the dependencies amongst 4D entities. It shows transitive dependencies (direct and indirect dependencies to other entities) from a root entity. Such analysis is helpful in order to understand the impact of changes or, for a migration project, to determine which part of the system can me migrated without impact.

You can analyze both outgoing and incoming dependencies of entities as well as cyclic dependencies amongst 4D entities.

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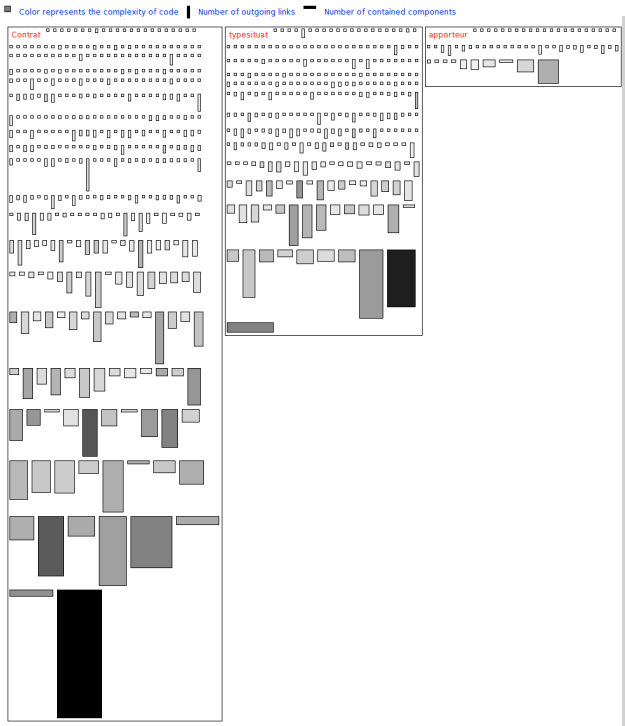
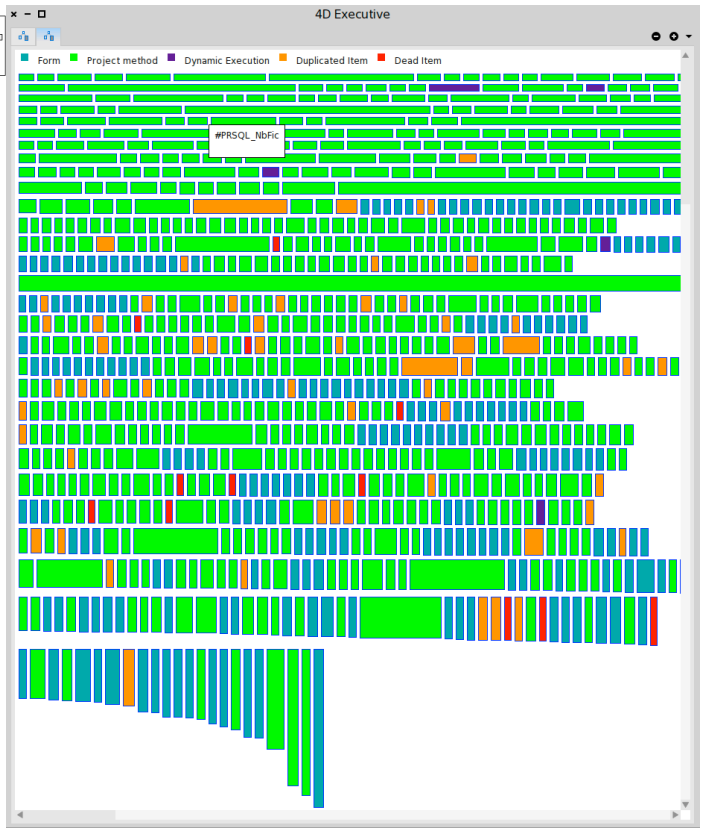
The Executive





The Executive Analyzer provides an interface to understand various key characteristics of 4D entities at the architectural level. It allows different views to show the complexity of code, links to entities, dead code and other custom-defined characteristics.

Inventive Toolkit Key Software Assets

Inventing Toolkit is composed of several engines that have been developed from 1996 up to today. The estimated research and development effort is more than 150 man years. Inventive Toolkit's engines (parser, tool builder, visualization, meta modeling, metric generators...) allow Synectique to deliver dedicated tools to answer your specific problems.

Modeling. Inventive Toolkit uses meta modeling at its roots. Software entities are represented as first class entities that can be manipulated. It extensively uses meta-models to ensure dedicated and tailored solutions for their clients.

Parsing. Importing information is important. Inventive Toolkit provides a variety of parsers to facilitate import of data from several sources and source languages.

Measuring. Inventive Toolkit defines software metrics. For specific needs, new metrics can be added easily.

Portfolio of analyses. Inventive Toolkit's advanced analysis plugins (for example, time series, formal concept analysis, dependencies structural matrix) can be used to build cross referencers, dependencies maps or extract other fine-grained information.

Visualizing and creating maps. One of the strengths of Inventive Toolkit is the possibility to define dedicated visualizations. Thanks to its innovative and flexible scripting engine, new software can be defined and updated on the fly.

Versatile and powerful meta tool builder. The tool enables Synectique to develop new dedicated tools in an agile way that facilitates customers to obtain dedicated solutions to their problems.

Reporting. Inventive Toolkit generates automatically validated reports that can be integrated into continuous integration servers such Jenkins.

Summary

Using Inventive Toolkit, we can easily define new analyses, create new visualizations, or build complete browsers and reporting tools altogether.

Dedicated Tools for Software Business Intelligence

Inventive Toolkit Portfolio

The underlying technology has been used in the following industrial projects: Credit Suisse (2012), CompuGroup Medical Schweiz AG (2010–2012), Eidgenössischen Institut für Geistiges Eigentum (IGE) (2008–2010), Glue Software Engineering AG (2008), Harman/ Becker Automotive Systems GmbH (2005–2006), Siemens AG (2006), IVU Traffic Technologies (2003), MediaGenix (2001), Bedag AG (2000).

The Inventive Toolkit has been successfully applied to create value for our clients including large insurance companies.

For one of its clients, Synectique built a special environment to support the analysis of a mainframe language. To answer the company's problems, Synectique delivered a set of applications that: (1) identify duplicated code, (2) help developers to understand their program – in particular following the paths of specific menus enabled the developers to identify parts of the applications that could be migrated to Cobol in parallel of the current development, and (3) dedicated tools for migration.

Synectique builds dedicated tools that solve specific company problems. This approach implies that the company should allocate experts to use the tools during their implementation and/or customization. These system experts also assess if the customized tools function as expected to assess your system's architecture and quality.

Licenses

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