QMetric

A Metric Tool Suite for the Evaluation of Software Process Data

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Motivation

- **Purpose**
  - Monitor current project states
  - Identify weaknesses in the development process
  - Assess the result of process changes
- **Background**
  - **Change Request** and **Configuration Management** Systems contain valuable information about the history of a process
- **Constraints:** Metrics of interest…
  - depend on **organization specific goals**
  - are retrieved from **heterogeneous** data sources
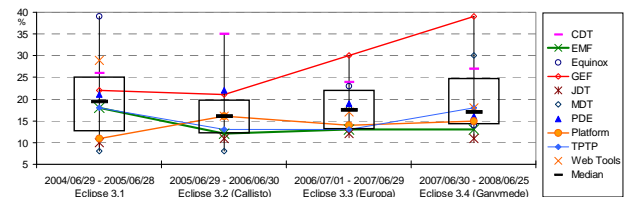
Declarative Metric Specifications

- **Limitations of existing tools**
  - Users can only use a **fixed set of metrics** with slight modifications
  - Defining and validating new metrics is **time-consuming**
- **Our approach: User-defined metric specifications**
  - Declarative description of **what** should be calculated
  - Allow to concentrate on the **model of the metric**, not on the **implementation**
  - Offer a large **flexibility** (e.g. mathematical operations, weights, filters, grouping, etc.)
  - Simplify development and **validation** of metrics

QMetric Tool Suite

- The QMetric Tool Suite provides a **general infrastructure** for the assessment of process quality based on evaluating software repositories
- **Features**
  - Flexible definition of a wide range of metrics based on **declarative metric specifications**
  - Web-based **metric query tool** for defining, evaluating and saving of metric queries
  - **Graphical wizard** for metric definition
  - Definition of organization-specific **quality models**
  - Automatic **evaluation** based on a quality model and **visualization** of the results
  - Interpretation based on **empirical data**
- **Open source: www.qmetric.org**

Example Evaluations

Percentage of defect reports with the **first reaction later than 3 days** and a severity of „normal" or higher

Percentage of **reopened change requests** relative to the number of resolved change requests in a time period
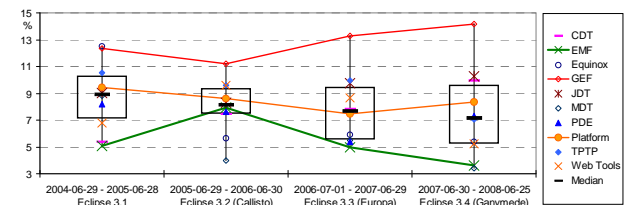
Design Concepts

- **Separation between Metric Specification and Metric Calculation**
  - Metric specification is independent from how it is calculated by the evaluation algorithm
- **Separation between Metric Calculation and Data Retrieval**
  - Metric Calculator is independent from the way the information is stored and retrieved
- **Extendability of the Metric Calculator**
  - Definition of new weights, events, and operations

Architecture of the QMetric Tool Suite

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