Wrocław University of Technology

DePress
Defect Prediction in Software Systems
An Extensible Software Measurement&Defect Prediction Platform

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Table of contents

- Introduction
  - Motivation

- Implementation Details
  - DePress Concept And Architecture
  - DePress Plugins
  - Example (Case Study)
- Collaborative Development Model
- Summary and Feature Work

Motivation

- A standardized, intuitive and extensible framework would make it possible to include predictive modelling in general, and defect prediction analyses in particular, as one of the common QA or SPI tasks, such as code review or software testing.

- Support for versioning repositories like SVN and GIT, bug and issue trackers like JIRA or Bugzilla and other measurement using simple configuration without need of custom development.

- Reuse of techniques offered by the most widely used platforms, such as R, Weka or KNIME.

- Open Source and open for collaboration.

DePress Concept

Workflow visualization and usability	Standalone
Support for collaboration	Export/import support
Extensible	Ready for commercial use
Language and Technology Independent	Open Source with clear licensing rules

Data Access   *Data Transformation*   *Data Analysis & Mining*   *Data Exploitation*

GIT Plugin
(pre release changes)

People & Organization Metric

GIT Plugin
(post release changes)

R To PMML   PMML File Writer

Jira Plugin   Row filter
(Type:BUG)   Issue Metric   Joiner   R Learner

EclipseMetric

DB Writer
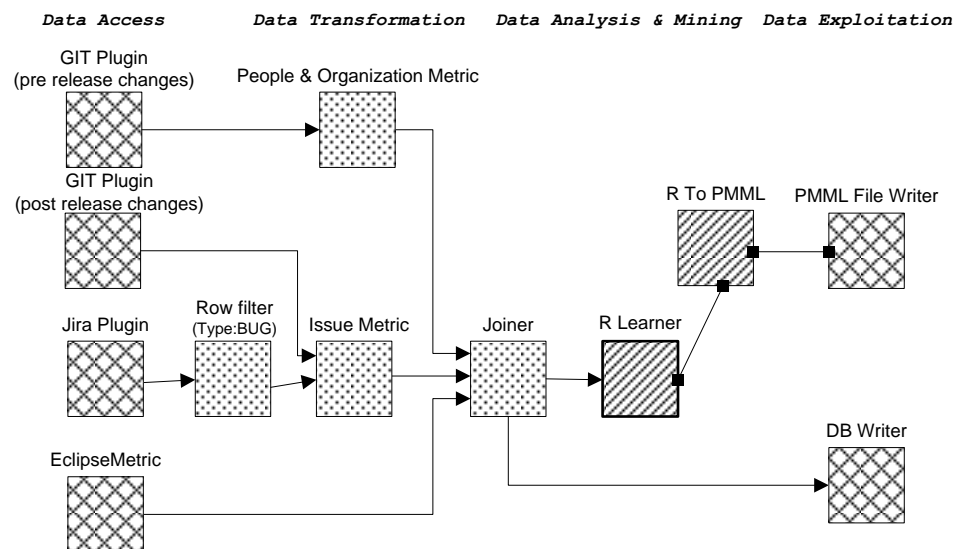
*Conceptual workflow for pre-release data collection

DePress Architecture

- **KNIME*** as an integration backbone

- Independent Plugins
    - Separate PDE* projects for each plugin group
    - Simple data exchange (via KNIME tables)
    - Reused KNIME components and guideline's
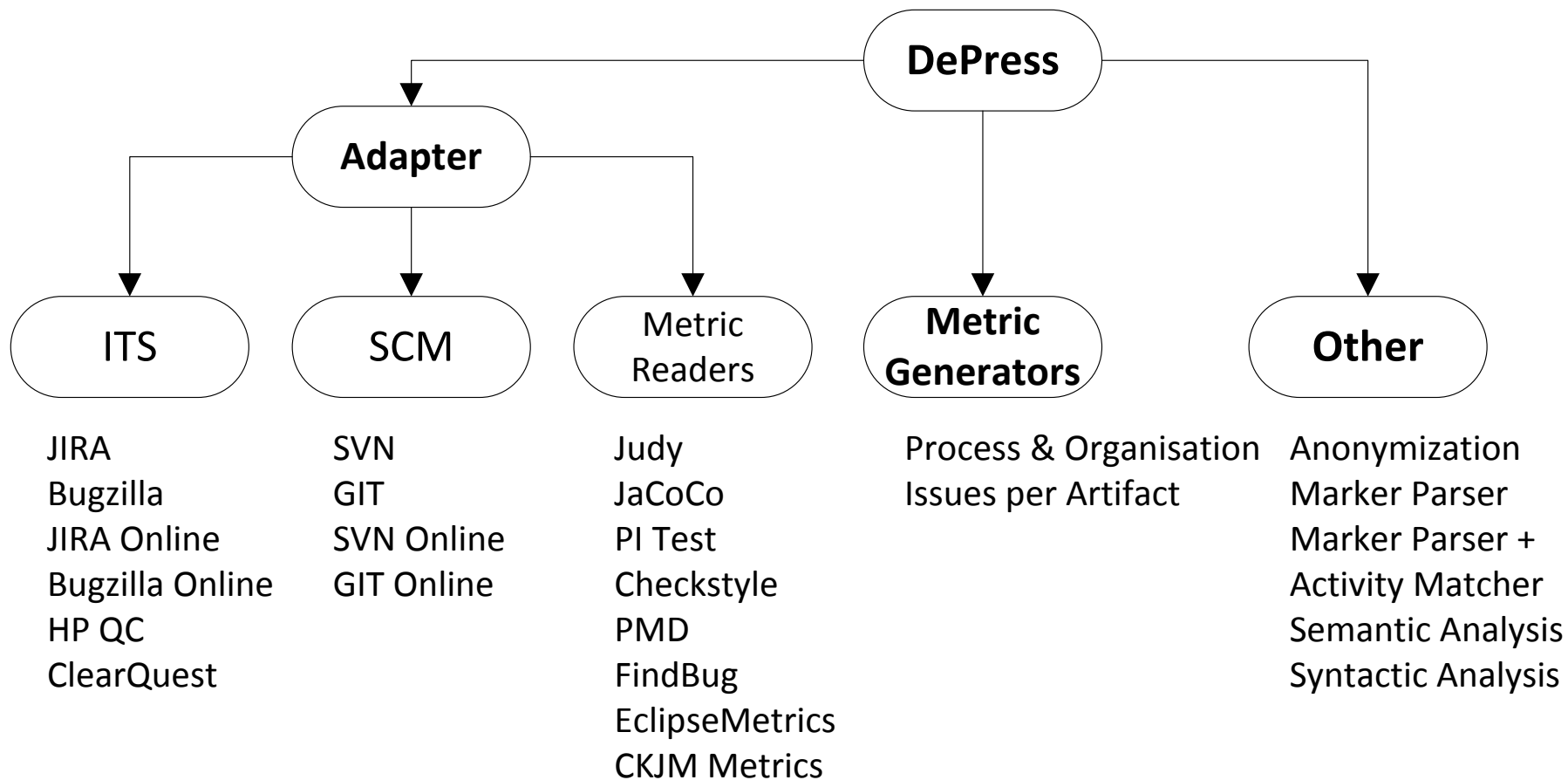
- Online and offline work mode

* KNIME Framework is an integration backbone which allows one to use various external statistical and machine learning tools.
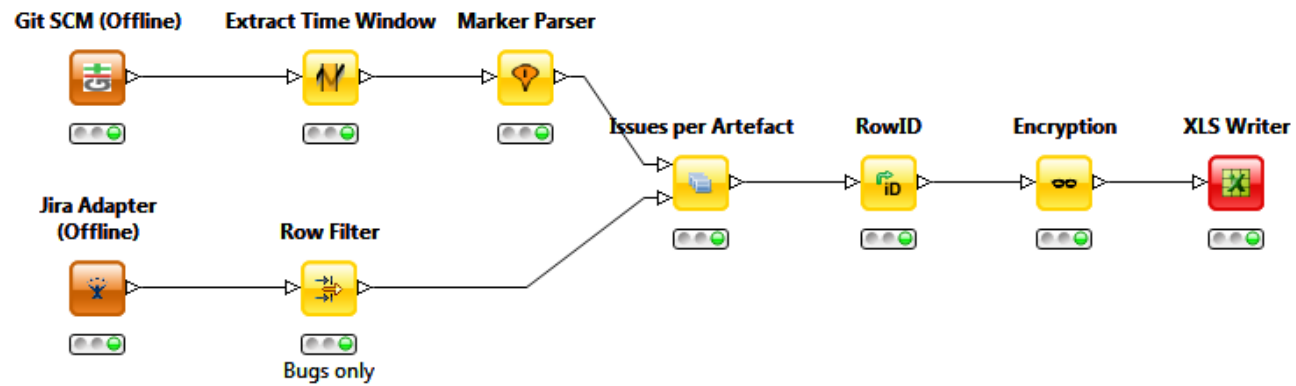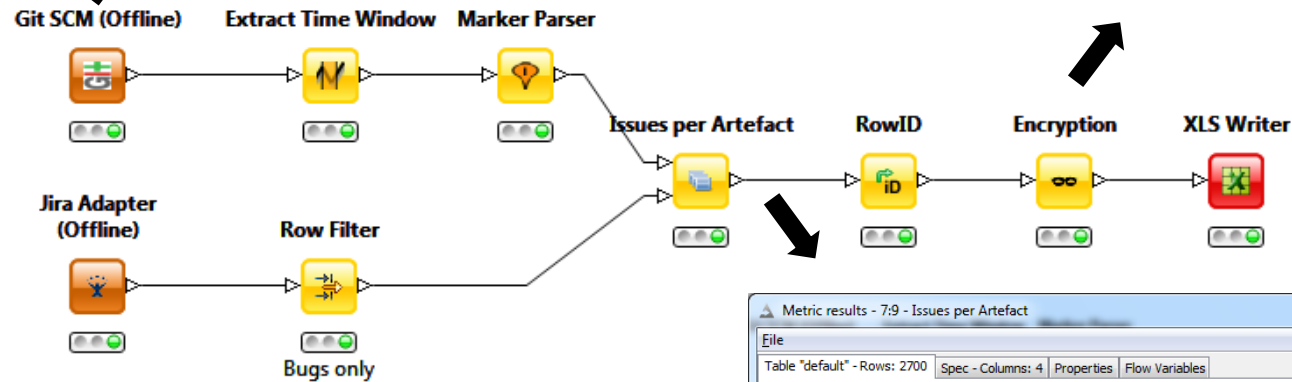*The Plug-in Development Environment (PDE) provides tools to create, develop, test, debug, build and deploy Eclipse plug-ins.
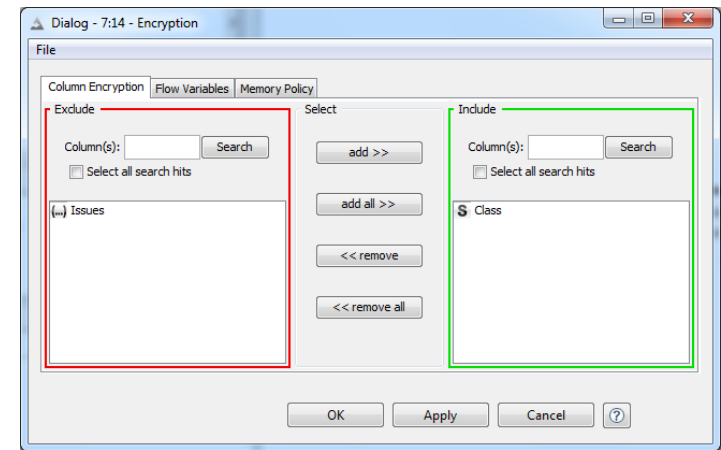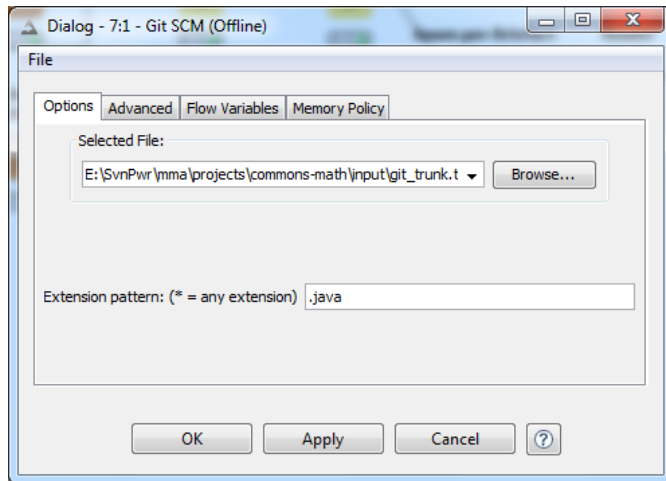
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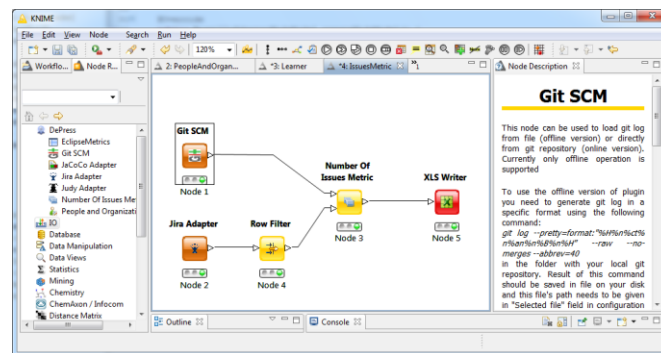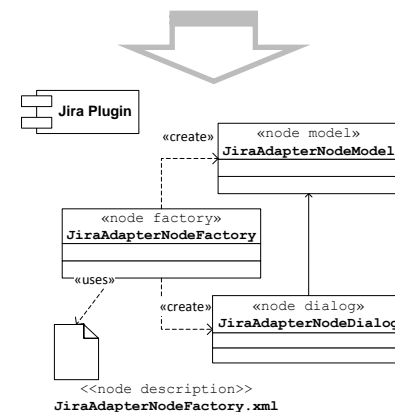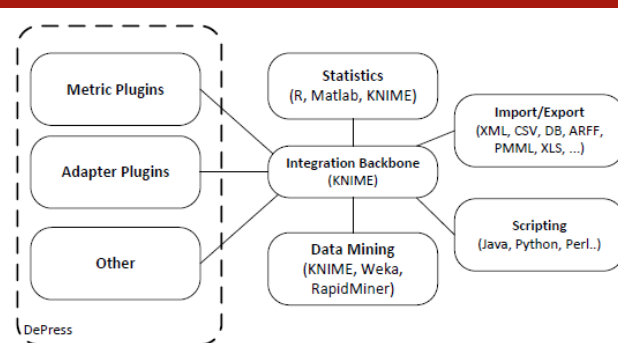
DePress Plugins V2 (ongoing)

DePress

Adapter

ITS

SCM

Metric Readers

Metric Generators

Other

JIRA
Bugzilla
JIRA Online
Bugzilla Online
HP QC
ClearQuest

SVN
GIT
SVN Online
GIT Online

Judy
JaCoCo
PI Test
Checkstyle
PMD
FindBug
EclipseMetrics
CKJM Metrics

Process & Organisation
Issues per Artifact

Anonymization
Marker Parser
Marker Parser +
Activity Matcher
Semantic Analysis
Syntactic Analysis

Example – Commons Math 3.1 Post Release Defects

Example – Commons Math 3.1 Post Release Defects

Open Source and Collaborative Development Model

- **Homepage:** www.depress.io

- **GitHub**: https://github.com/ImpressiveCode/ic-depress

- **Licensing Policy**: GPL v3 License

- **Contribution**: Wroclaw University of Technology, Capgemini Poland
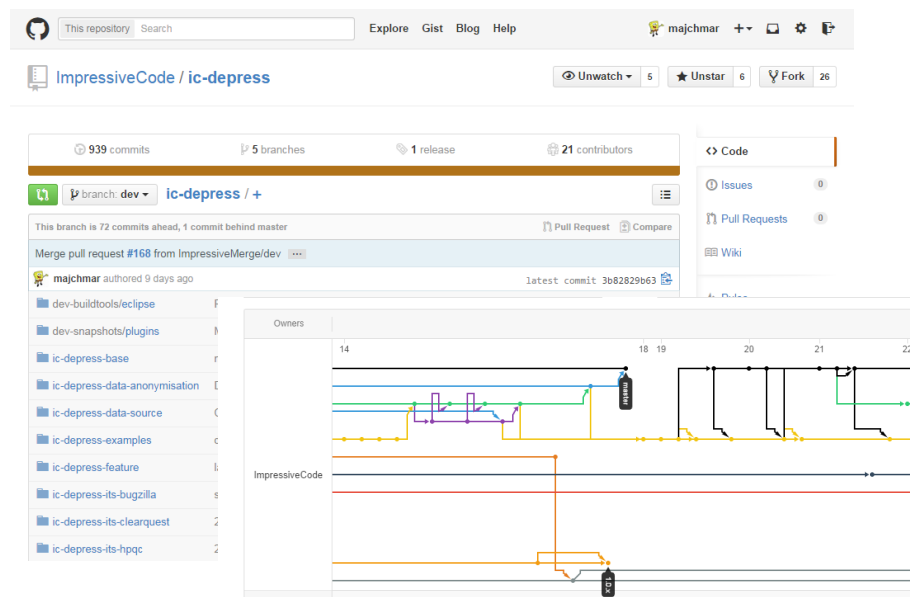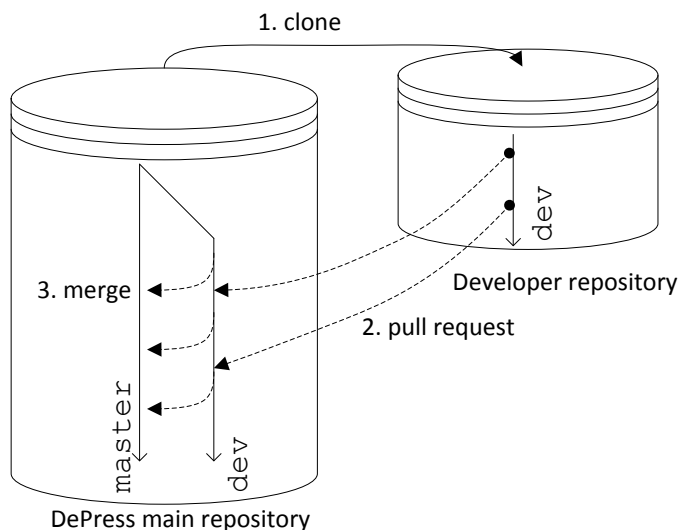
Summary

- DePress is a visual and workflow-oriented framework based on KNIME framework.

- DePress supports software defect prediction but also, to some extent, other areas of predictive modelling in software engineering where the collected metrics can serve as predictors.

- Developed under GPL v3 on GitHub platform.

www.depress.io
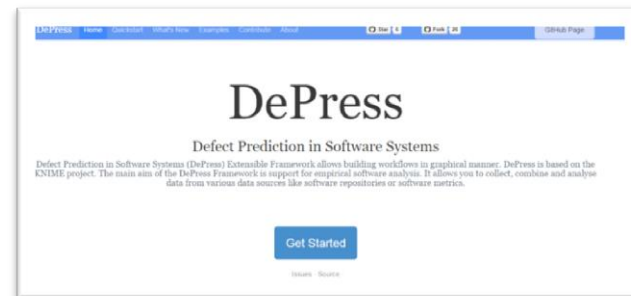
Feature Work

- Support for new data sources

- Support for code churn and burst change related metrics

- Evaluate the effectiveness of DePress usage by QA Engineers in commercial software projects

- Open to wider group of contributors and researchers

Thank You! Q&A

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