INCOME2010 - a Toolset for Developing Process-Oriented Information Systems Based on Petri Nets

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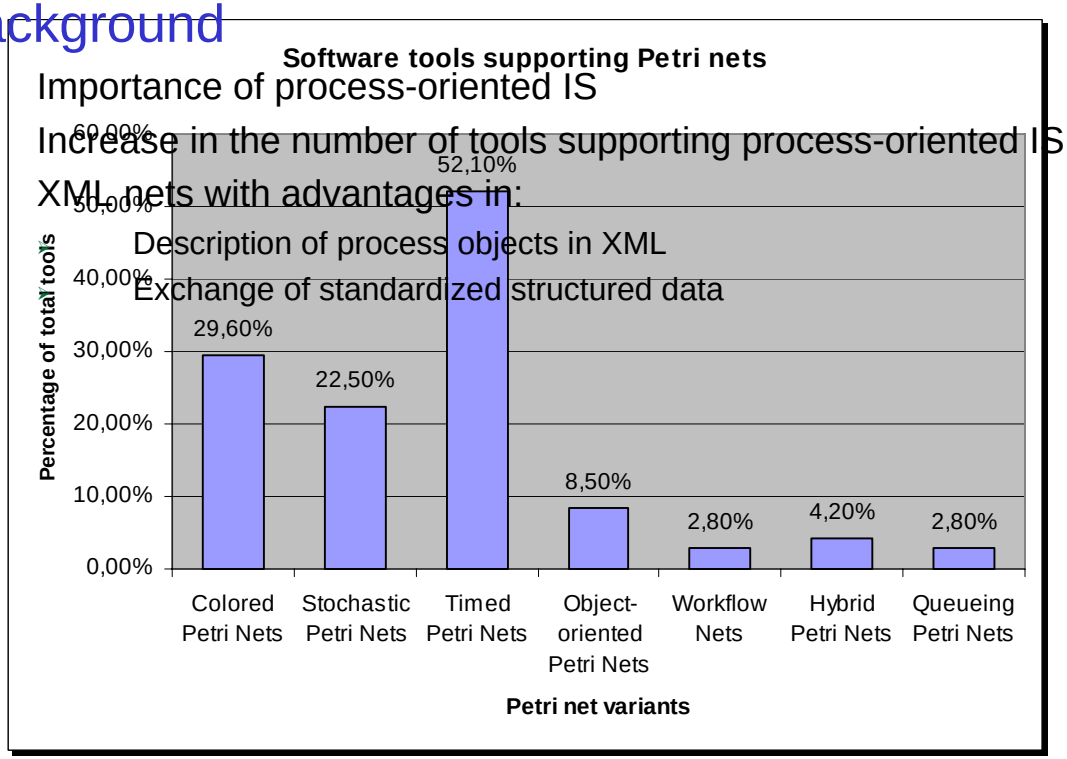
Agenda

- Motivation
- XML nets
- Requirements
- Architecture
- Implementation
- Features
- Demonstration
- Summary & Outlook

Motivation

- Background
  - Importance of process-oriented IS
  - Increase in the number of tools supporting process-oriented IS
  - XML nets with advantages in:
    - Description of process objects in XML
    - Exchange of standardized structured data

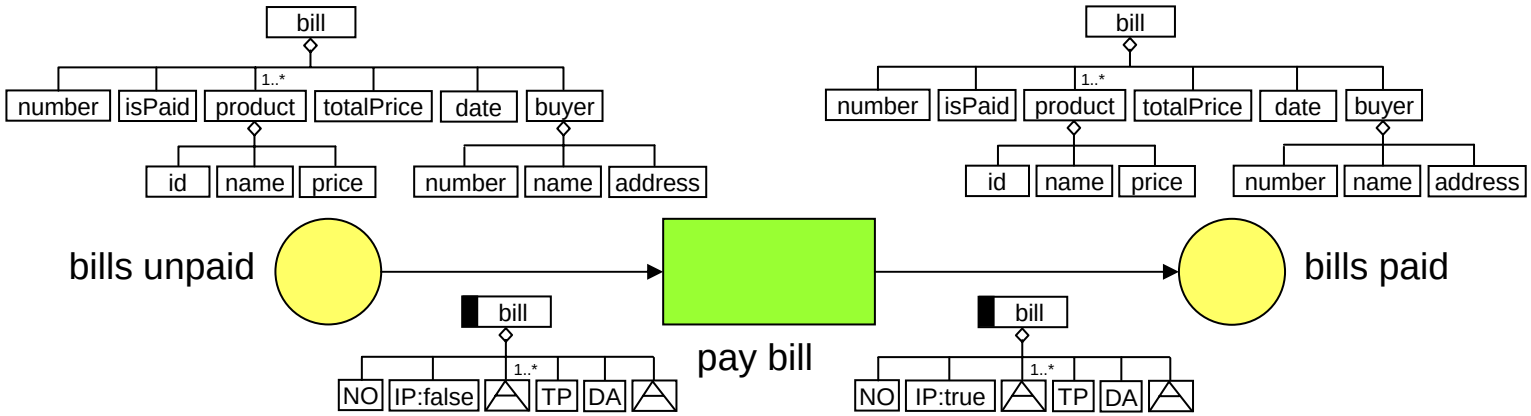


Data source: Petri Nets Tools Database (http://www.informatik.uni-hamburg.de/TGI/PetriNets/tools/db.html)

There were no software tools available which support XML nets.

XML nets

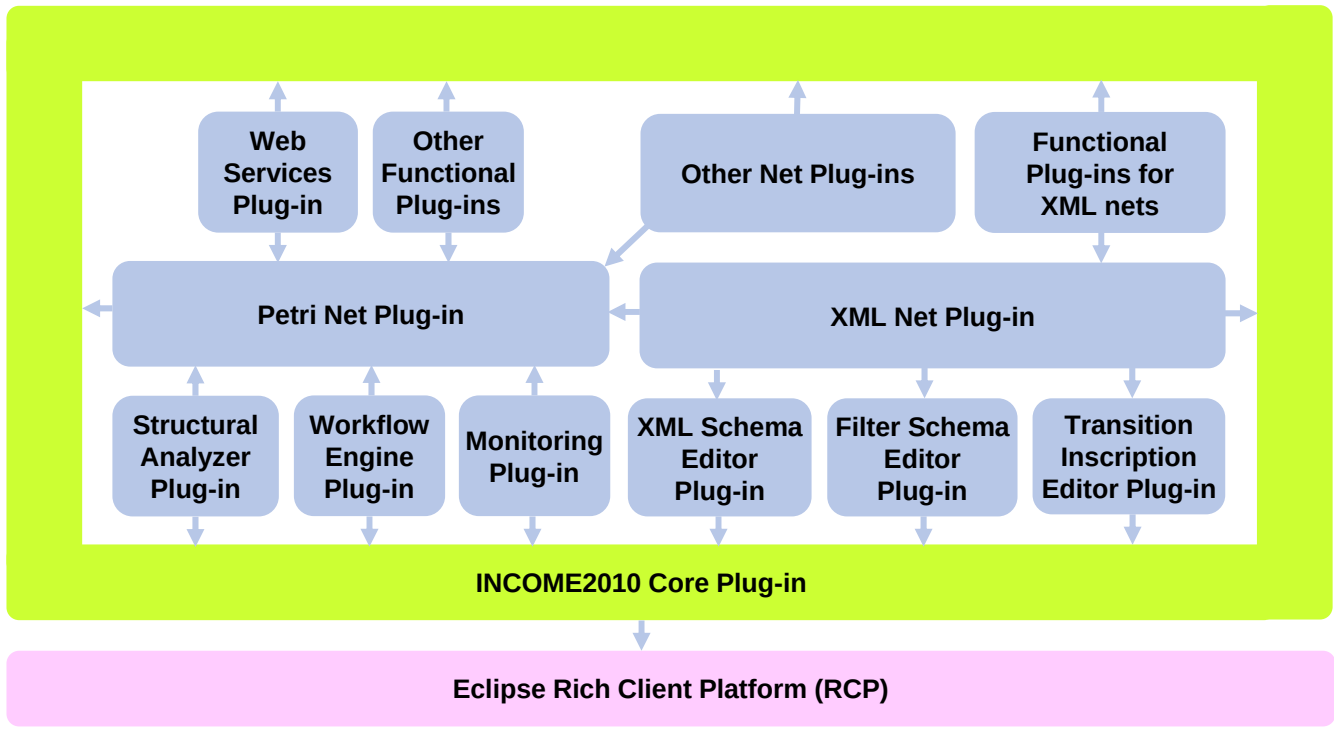
- XML Nets
  - Variant of high-level Petri Nets
  - *Places*: Containers of XML documents, typified by XML Schemas
  - *Transitions*: Optionally inscribed by predicate logical expressions
  - *Edges*: Inscribed by Filter Schemas for reading or manipulating XML documents



Requirements

- Functional requirements
  - Graphical modeling of process flows (control flows)
  - Modeling of data flows
  - Definition and evaluation of (business) rules
  - Modeling of organizational structure
  - Definition and management of process metrics
  - Hierarchy modeling
  - Reusable process fragments
  - Analysis of process models
  - Execution of process models
  - Monitoring of process execution
  - Dynamic process management
  - Incorporation of SOA concepts
- Non-functional requirements
  - *Run-time*: usability, availability, performance, …
  - *Development-time*: extensibility, scalability, composability, reusability, …

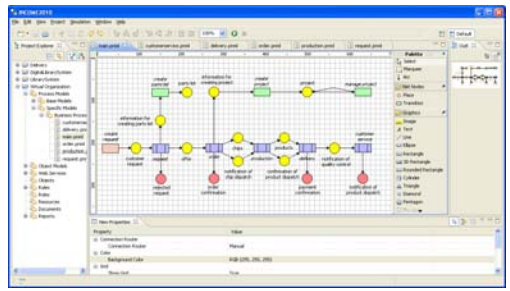
Architecture



Implementation

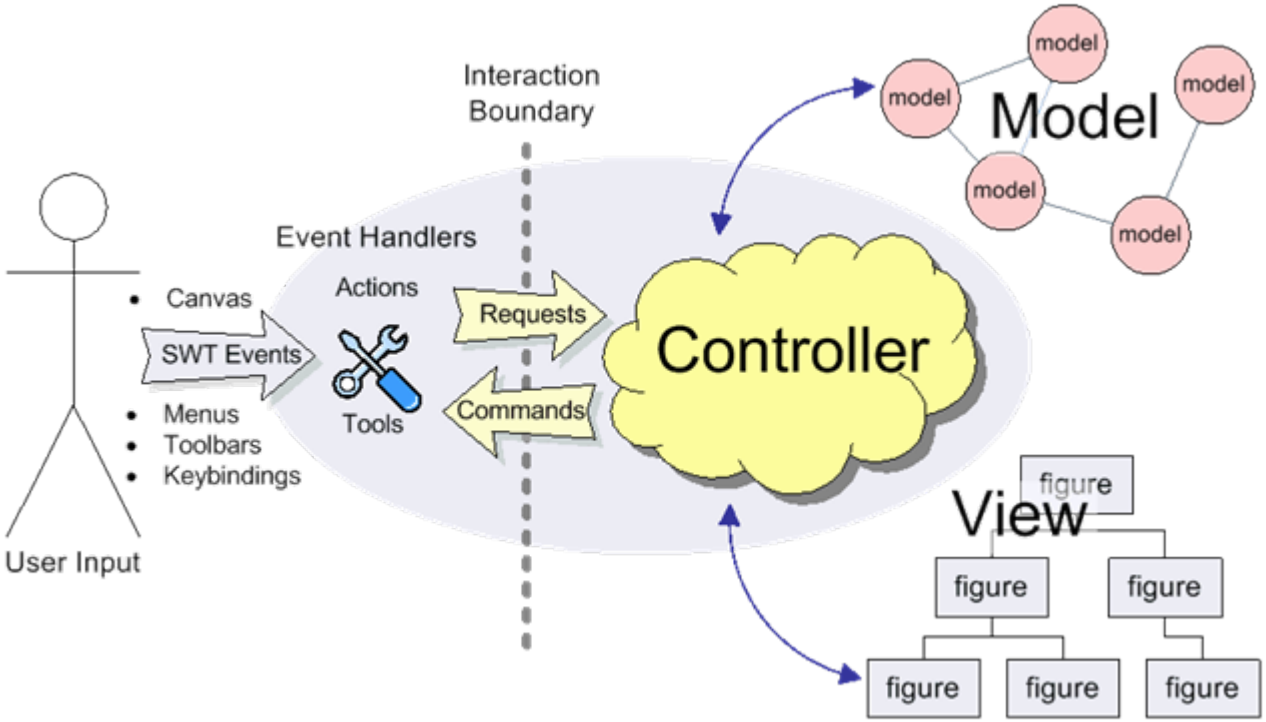
- Project status
  - Type: Open source
  - License: Eclipse Public License
  - Begin: February 2006
  - End (expected): 2010
  - Partner: AIFB, Promatis, FZI
  - Version: 0.2.3

- Technologies used
  - Java 1.6
  - Eclipse Rich Client Platform (RCP)
  - Eclipse Graphical Editing Framework (GEF)
  - PNML, XNML
  - XMLBeans, XQuery



Implementation

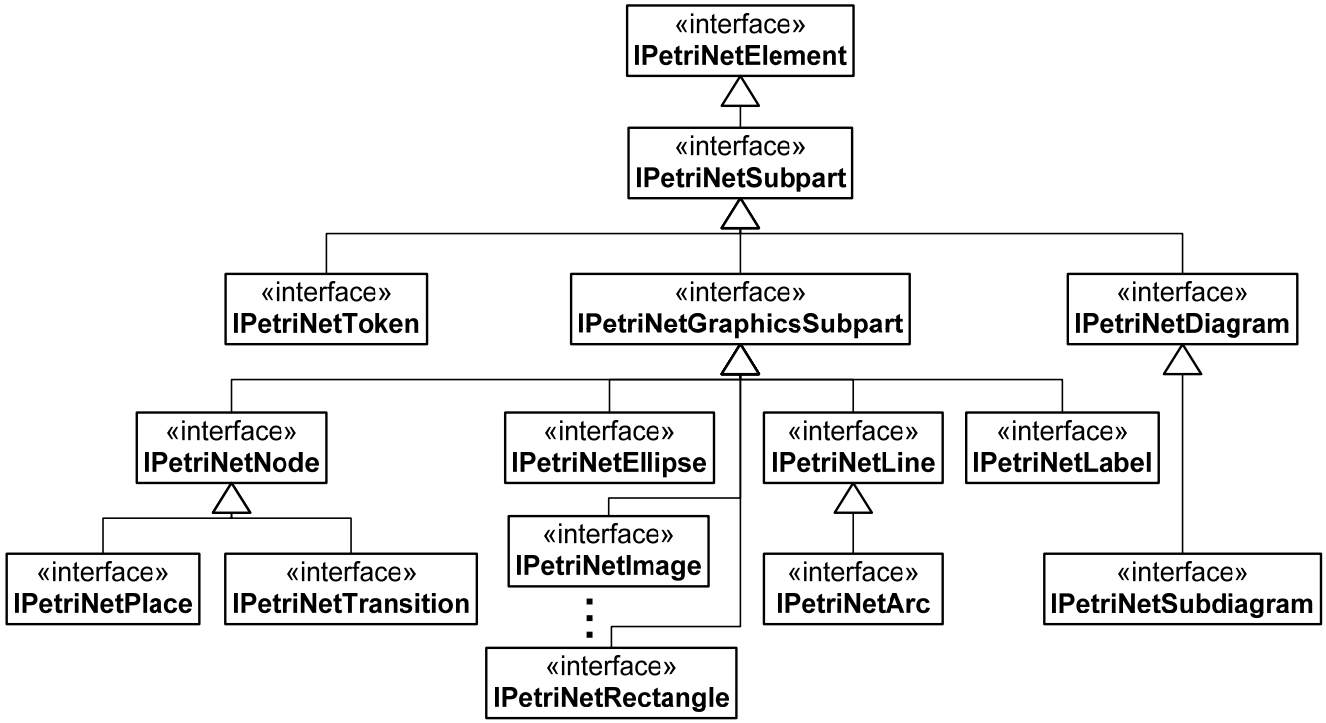
- MVC pattern



Source: GEF Programmer's Guide (http://help.eclipse.org/help31/index.jsp?topic=/org.eclipse.gef.doc.isv/guide/guide.html)

Implementation

- Interfaces for Petri net element models



Features

- Features implemented:
  - Graphical modeling
  - Hierarchy modeling
  - Animated token game simulation
  - PNML-compliant file format
  - Structured standard information describing net nodes
  - Role and resource
  - Graphical editing support
  - Graphical export of diagram
  - Categorized project structure
  - BPEL converter
  - …

Demonstration

Summary and Outlook

- Summary
  - An open source software toolset facilitating the development of process-oriented information systems using high-level Petri net variants and SOA concepts.
  - Open platform, including but not limited to supporting XML nets.

- Outlook
  - Implementation of other functional plug-ins and features, e.g.
    - Automated simulation with detailed report
    - Element library for reusable net components
    - Editors for Filter Schema, transition inscription and organigram
    - Structural analyzer
    - Workflow engine
    - Monitor
  - Integration of other Petri net variants or tools
  - 3D visualization of process flow
  - Web edition based on Web 2.0 technologies, e.g. Eclipse Rich Ajax Platform (RAP)

Further Information

Please visit our website

http://www.aifb.uni-karlsruhe.de/Forschungsgruppen/BIK/income2010/

for more information.