

# User modules and extending the capabilities of the simulator

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## Possibilities of using modules

- Changes processing patterns and settlement conventions used in simulations
- Expands the functionality of the simulator
- User can develop own modules for their exact needs
- User might also use modules created by other users



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## Basic features of algorithms

- Receive either a transaction or a queue of transactions as an input parameter
- Decide how these transactions are treated
- As a result some transactions are booked and some remain in queues (or are put into queues in case new transactions were created)
- Update output statistics



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## Features of user modules

- Essentially equal to ready made algorithms
- Use the same interface as the algorithms provided with the Simulator
- Name, type, location and possible parameters have to be defined in user module definition screen
- After definition modules can be employed as normal algorithms



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## Technical

- Every module must be inherited from abstract class **Algorithm**
  - gives the user module access to information sources of the main system
  - offers methods to pass results to the simulation
  - offers methods to update statistics
- Every module must be an instance of one of the defined algorithm types of the simulation



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## Payment queues

- Each system has a queue management, ie each system has reference to all payments belonging to the participants of that system
- Each participant of the system has its own queue as well
- Settlement order of payments can be changed by sorting queues with different criteria (up to three criteria: priority, time...)



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## Configurable algorithms

- User modules can be configured by passing parameter(s)
- If module uses parameters those must be defined in user module definition screen
- The name of the parameter must be equal to the key used in module implementation
- Parameter values must be set in system control data specification screen, when using the module



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## Implementation



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```

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// Module: .../projects/.../src/modules/INPAULI.java

import java.util.*;

/**
 * Injects the given value when required from the main system to the machine
 * system account and deleted the same account when it is possible
 */

public class INPAULI extends Algorithm implements INJECTORALGORITHM {

    private static final String PARAMETER = "PARAM";

    private double injectionValue;

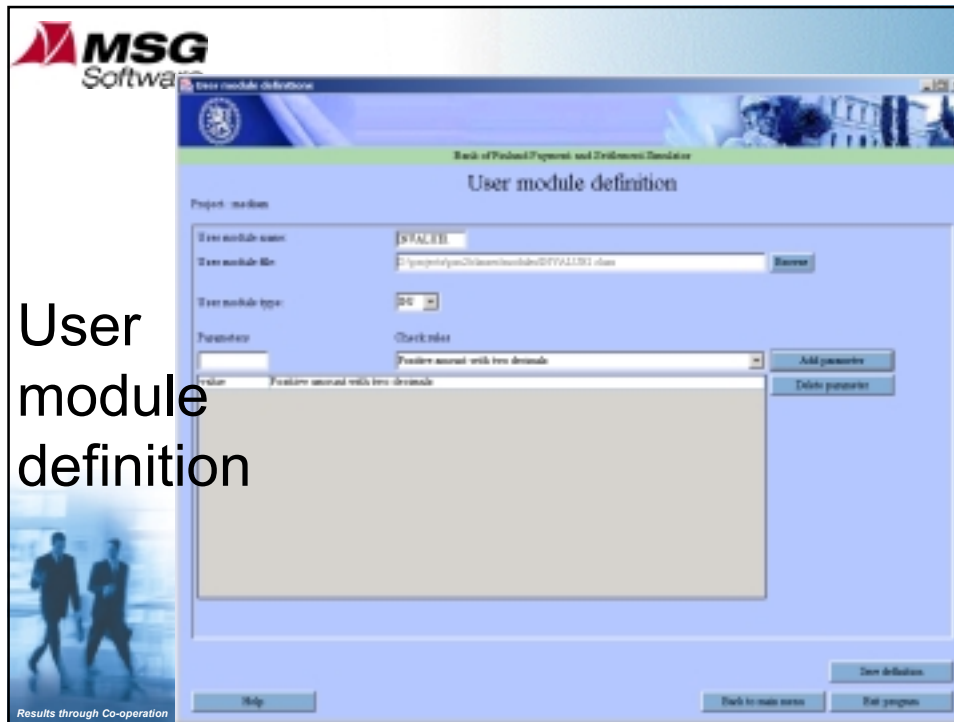
    /**
     * default constructor
     */
    public INPAULI() {
        super(ALGORITHM.INJECTOR);
    }

    /**
     * algorithm implementation method
     * Returns true if valid
     */
    public boolean isValid() {
        return true;
    }

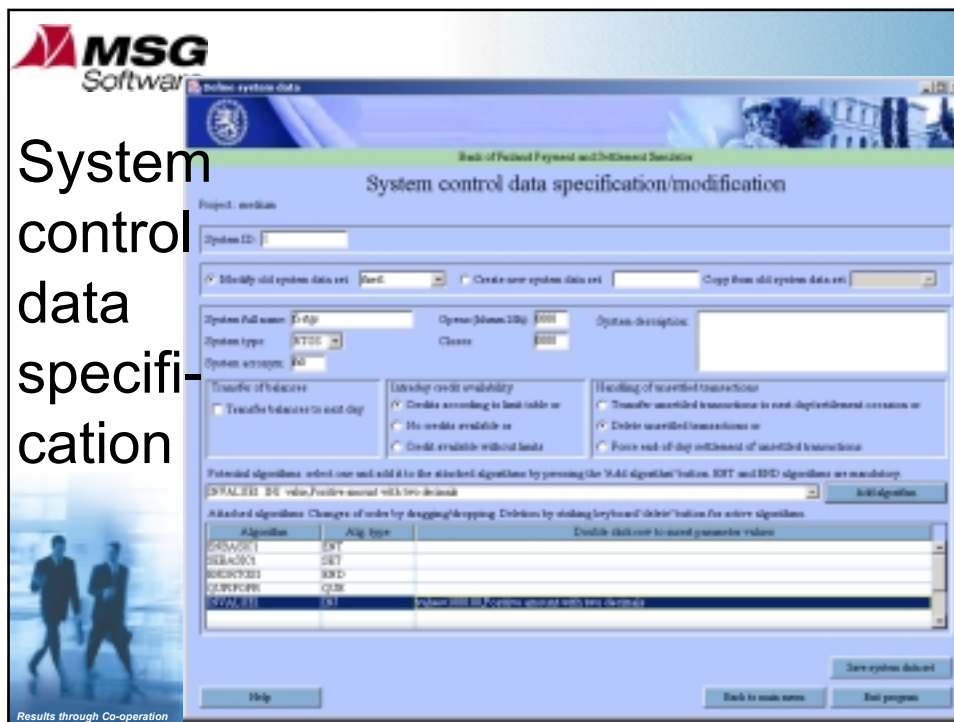
    public void setParam(String param) {
        if (param == null) {
            return;
        }
        if (param.equals(PARAMETER)) {
            return;
        }
        return;
    }

    /**
     * process injection
     * System parameter
     */
    public void process(Transaction paramTransaction) {
        // do something
    }
}

```



User  
module  
definition



System  
control  
data  
specifi-  
cation



## Requirements for module/algorithm development

- Java software development kit (J2SE 1.3.1)
- Optionally Java development environment. BoF-PSS2 is created using Borland JBuilder 6, other environments are possible but a new project file is needed
- BoF-PSS2-jar file
- MySQL Connector/J for connecting MySQL with Java



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## Information needed to create new algorithm

- Accurately defined requirements of the algorithm
- Sorting criteria of queues when developing algorithms for queued transactions
- Parameter requirements and parameter types



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