BoF-PSS2

Payment and Settlement System Simulator

- Tool architecture

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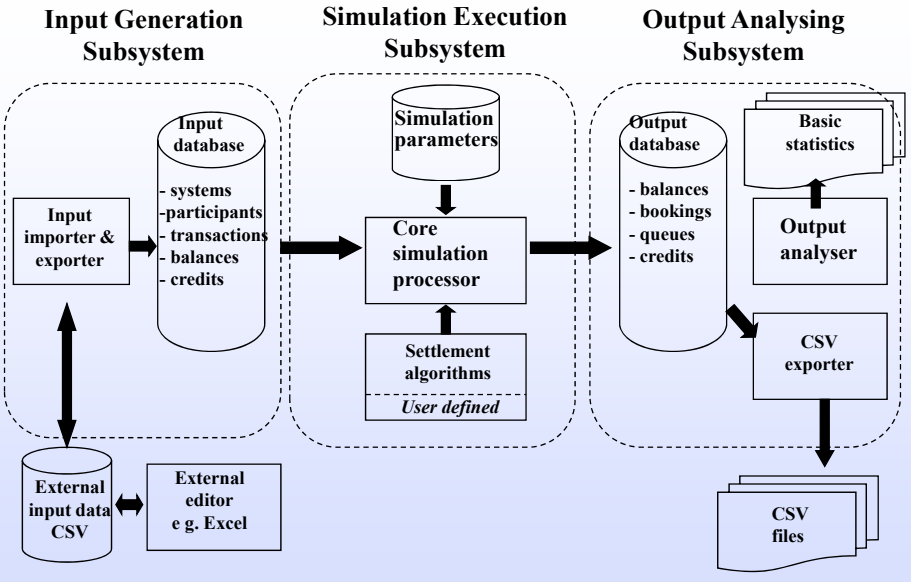
Simulator structure



Bank of Finland Payment and Settlement Simulator

Deterministic simulations with historic or stochastic input

- The result of a simulation is always the same with a given input
- Input can be historic time series or stochastic/artificial time series
- The results of multiple simulation runs are compared and variations are analysed as well as critical incidents

Input database data table structure

SYCD, system level control data	**(mandatory)**
PART, participant/account level data	**(mandatory)**
TRAN, transaction data	**(mandatory)**
DBAL, daily opening balances	**(optional)**
ICCL, intraday credit changes	**(optional)**
BLIM, bilateral limit changes	**(optional)**

All data for the PART, TRAN, DBAL, ICCL and BLIM data tables are imported via CSV-files (comma separated values). SYCD system level data is defined via a separate screen.

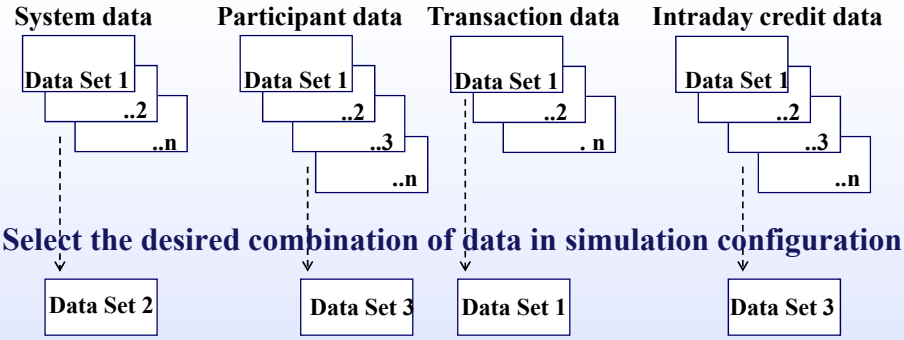
Important input data keys

- SystemID = The key of the defined systems
- ParticipantID = The ke_ of defined _artici_ants
- ParticipantID+AccountID = The key in case same participants have several accounts
- DatasetID = The ke_ to se_arate _arallel in_ut data

Clear IDs help to run large simulations projects

Simulation configuration and cross-check

- Data set IDs allow storage of parallel data tables in data base



- Select the desired combination of data in simulation configuration
- Cross-check the selected combination for internal coherence
  - participants, dates, times, etc

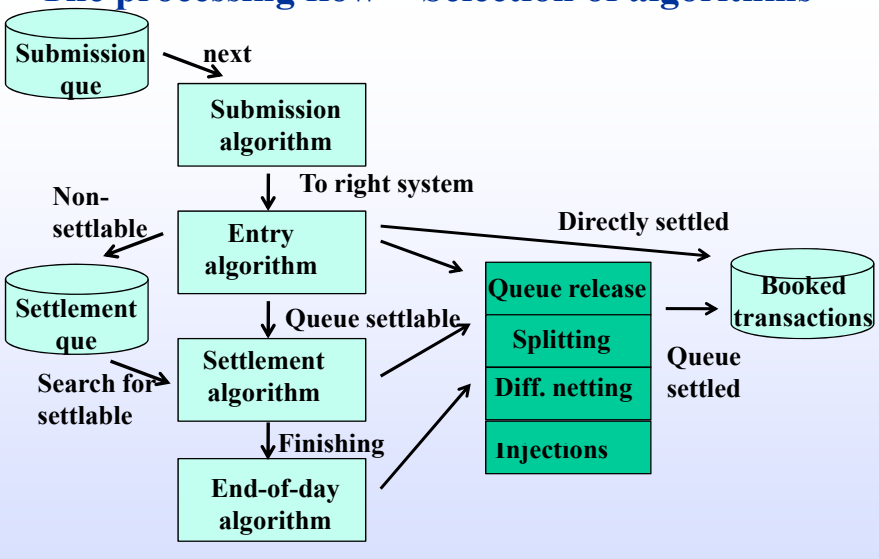
Use a clear labelling convention for different data sets

Output database structure

- **Each simulation creates a set of output data defined by the key SimulationID**
- **The user defines which output data table will be stored in the output database for each simulation**
- **Available tables eg**
  - **System level statistics**
  - **Account level statistics**
  - **Transaction level statistics**
  - **Netting event statistics**
  - **Queued transactions statistics**
  - **etc**

The output database may grow really huge if all output is stored for all simulations

The processing flow = Selection of algorithms



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Use of Excel

- Excel is used for viewing CSV-files
- Excel can be used for editing input CSV-files
- Excel can be used for makin_ re_orts out of CSV-files
- Current Excel versions have a limitation of 65.000 rows
- Excel is often producing extra empty rows/columns (,,,,,)
- Check that delimiters (decimal and data separators) and presentation formats (date and time) are identical with simulator specifications
- Large values may be distorted (less accuracy)
- The actual content of CSV files stored by Excel can be checked with eg Notepad

Use of MySQL

- MySQL provides advanced functions for database management (see www.mysql.com)
- Augments advanced user capabilities when simulator functions are insufficient
- Some special administration features omitted in the simulator and MySQL required when e.g. deleting projects, templates, comparison views, user module definitions and batch-run IDs
- MySQL has ready-made interfaces eg to Access
- Detailed database description available on web-site