Towards Systematic Spreadsheet Construction Processes

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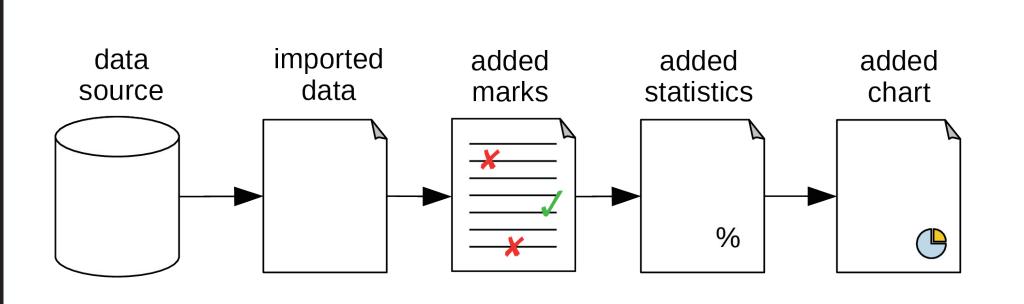† NOVA LINCS, DI, FCT, Universidade NOVA de Lisboa, Portugal
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Ad-hoc Construction

data source → imported data → added marks → added statistics → added chart

Only the current version is known, or multiple copies were saved to keep a sense of what was created.

How do you master the computational complexity of your spreadsheet?

Someone built this large spreadsheet. **Does it have errors?**

I was given a new spreadsheet. **How do I work with it?**

Another year passed. **How do I produce the report with the new data?**

Systematic Construction

Spreadsheet Process Engineering

- composition of functional services
- reuse of concepts from situational method engineering
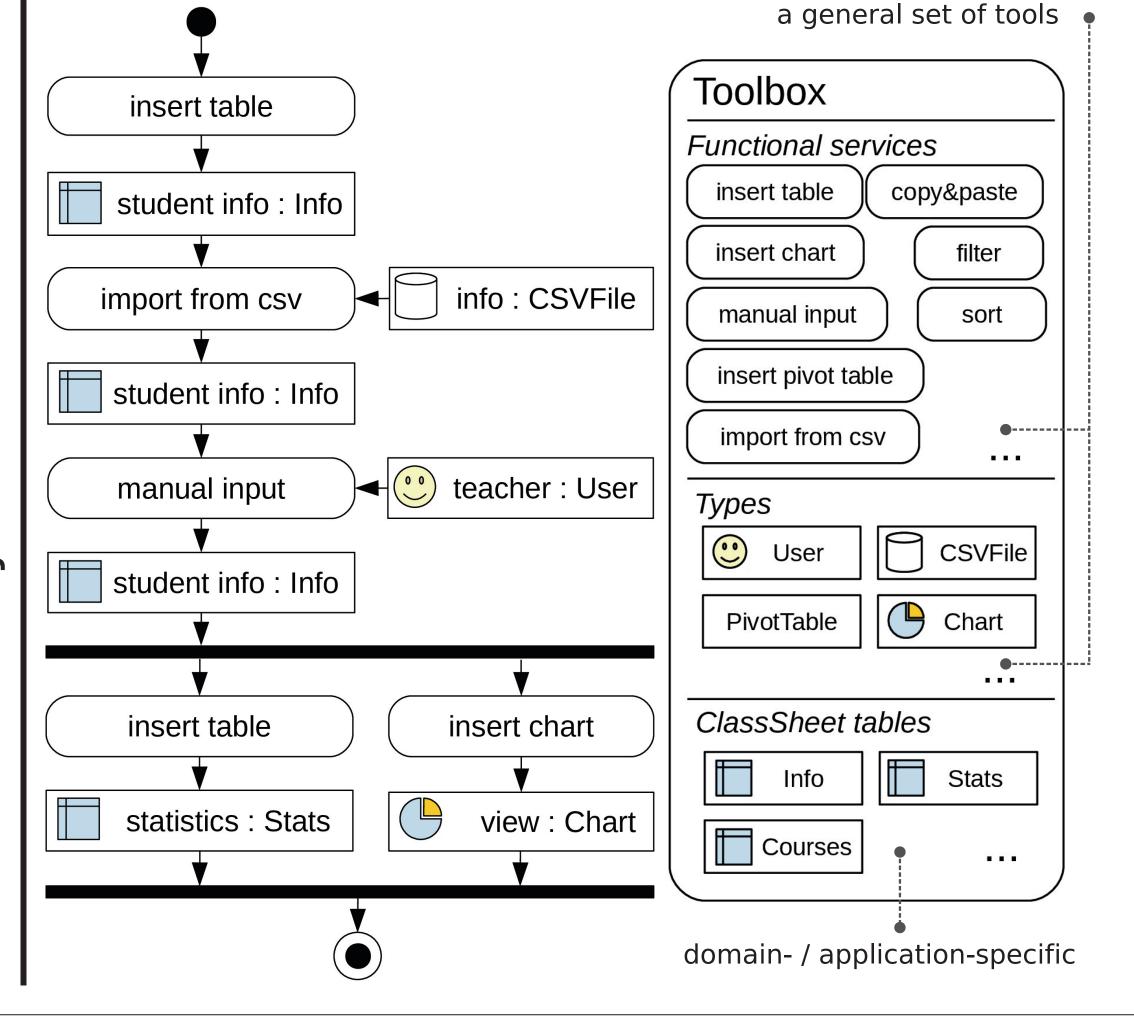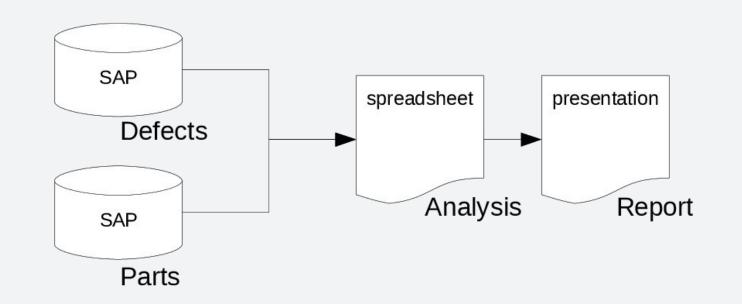- ClassSheets as type specification of spreadsheets

Requirements ⇒ Process Design ⇒ Process Enactment

Example of a Spreadsheet Construction Process

a general set of tools

Toolbox

Functional services
- insert table
- copy&paste
- insert chart
- filter
- manual input
- sort
- insert pivot table
- import from csv
- ...

Types
- User
- CSVFile
- PivotTable
- Chart
- ...

ClassSheet tables
- Info
- Stats
- Courses
- ...

domain- / application-specific

Industrial Case Study
Bosch Car Multimedia, Portugal

SAP Defects / SAP Parts → spreadsheet (Analysis) → presentation (Report)
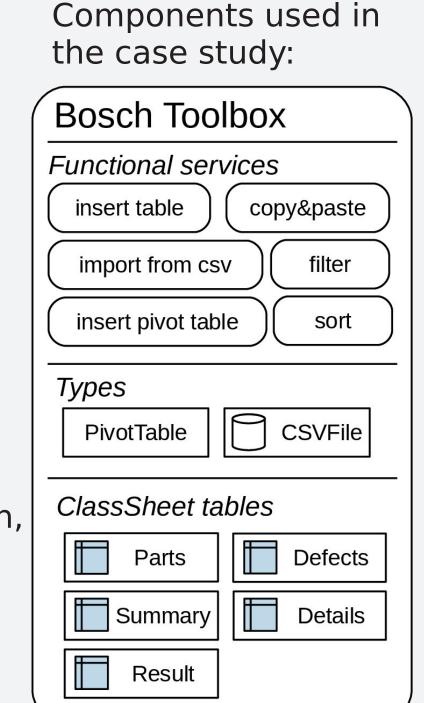
1 spreadsheet:
- 2 data sources { 72 columns × 2300 entries / 2 columns × 1400 entries }
- 5 intermediate spreadsheets
- 1 result
- 3 distinct analyses
- built every week
- reported every month
- hand-made
- performed at multiple factories in a non-uniform process

The process has no user interaction, thus it can be automatized!

Components used in the case study:

Bosch Toolbox

Functional services
- insert table
- copy&paste
- import from csv
- filter
- insert pivot table
- sort

Types
- PivotTable
- CSVFile

ClassSheet tables
- Parts
- Defects
- Summary
- Details
- Result

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DAAD Deutscher Akademischer Austauschdienst German Academic Exchange Service

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