End-User Development Framework with DSL for Spreadsheets

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Situation

- Governmental finansial institution
- Systems input documents – tables with figures
- Systems reports – tables with figures
- Frequent changes of requirements – new input documents and reports

Kinds of Input Documents and Reports

Input document

Year: 2011 Issuer: Client1

	Col1	Col2
Row_1	*Num_1-1*	*Num_1-2*
Row_2	*Num_2-1*	*Num_2-2*

a) Example of input document

Report over issuers

Year: 2011

Client	Indication_1	Indication_4
Client_1	*Num_1-1*	*Num_2-2*
Client_2	*Num_1-1*	*Num_2-2*
...	...	...
Client_n	*Num_1-1*	*Num_2-2*

b) Vertically flowing-type report

Report over years

Client: Client_1

Period from: 2009 till: 2011

	2009	2010	2011
Indication_1	*Num_1-1*	*Num_1-1*	*Num_1-1*
Indication_2	*Num_1-2*	*Num_1-2*	*Num_1-2*
Indication_3	*Num_2-1*	*Num_2-1*	*Num_2-1*
Indication_4	*Num_2-2*	*Num_2-2*	*Num_2-2*

c) Horizontally flowing-type report

Report over clients and years

Period from: 2009 till: 2011

	2009		2010		2011	
Client	Ind_1	Ind_4	Ind_1	Ind_4	Ind_1	Ind_4
Client_1	*Num_1-1*	*Num_2-2*	*Num_1-1*	*Num_2-2*	*Num_1-1*	*Num_2-2*
Client_2	*Num_1-1*	*Num_2-2*	*Num_1-1*	*Num_2-2*	*Num_1-1*	*Num_2-2*
...	...	...	...	...	...	...
Client_n	*Num_1-1*	*Num_2-2*	*Num_1-1*	*Num_2-2*	*Num_1-1*	*Num_2-2*

d) Report flowing in both directions

Pros and Cons

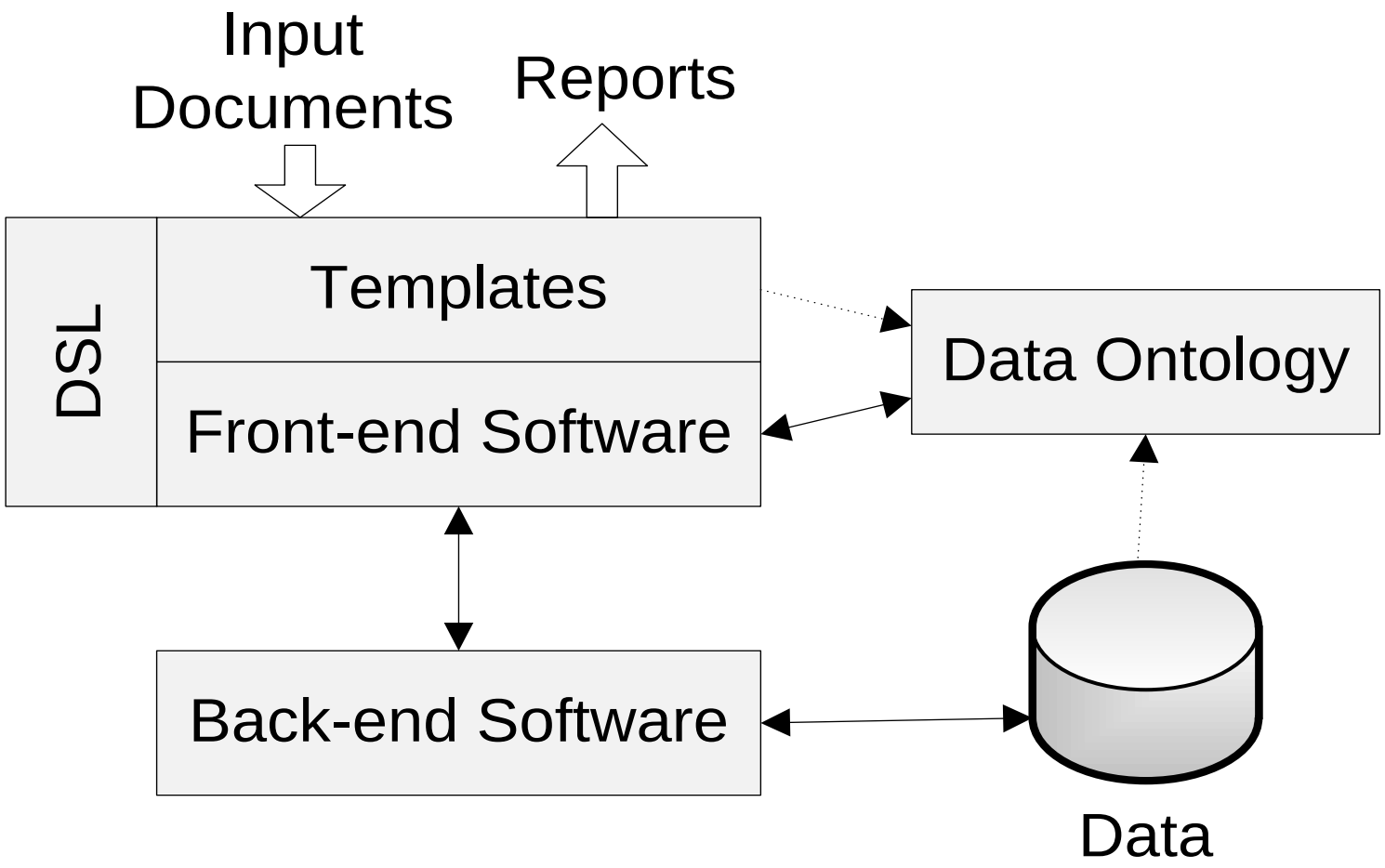
+ End-users very interested in – they need system as soon as possible

- Very little amount of time for development
- Small development team

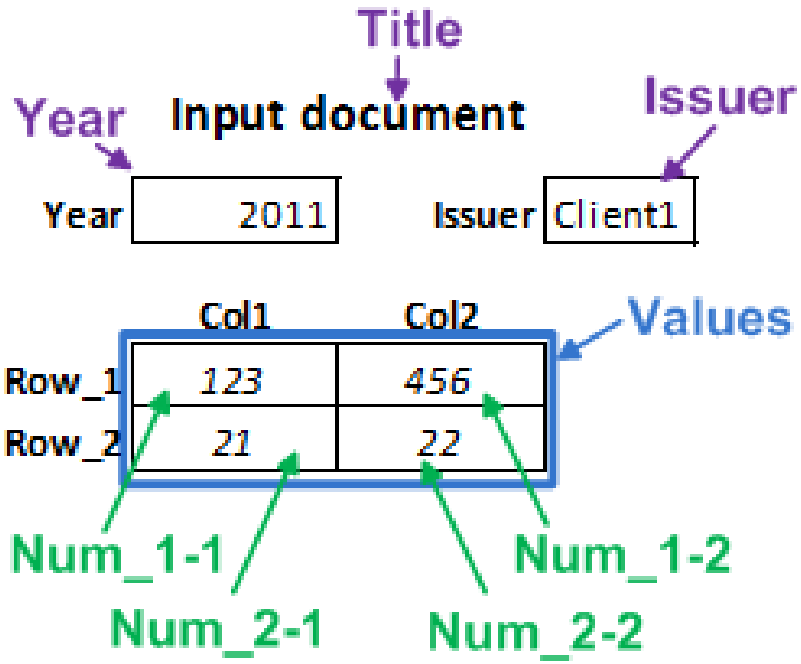
Solution

- User interface – spreadsheet
- Users:
  - Design specifications input documents and reports as spreadsheets
  - Develop templates from specifications using domain specific language (DSL)
  - Test system’s user interface

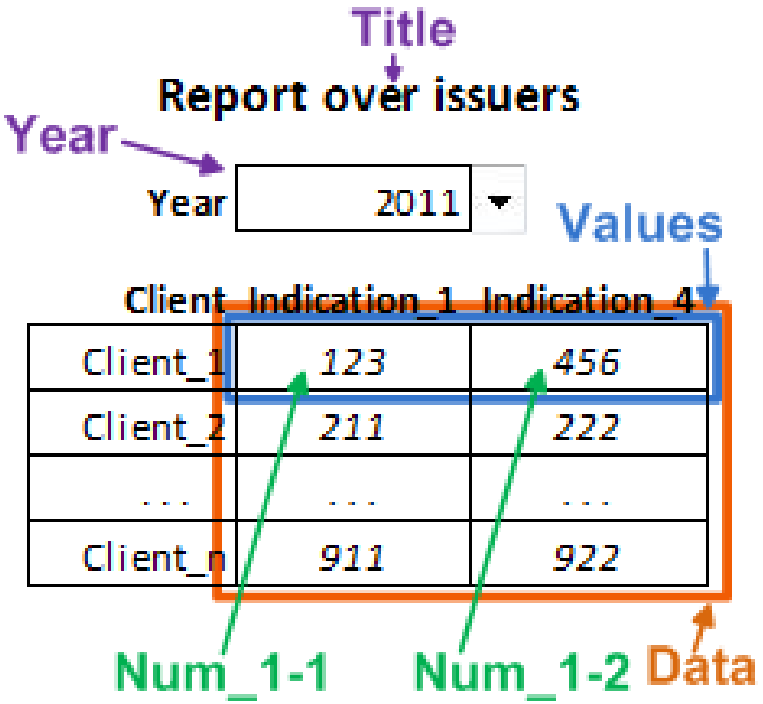
Framework Architecture



UI templates' DSL

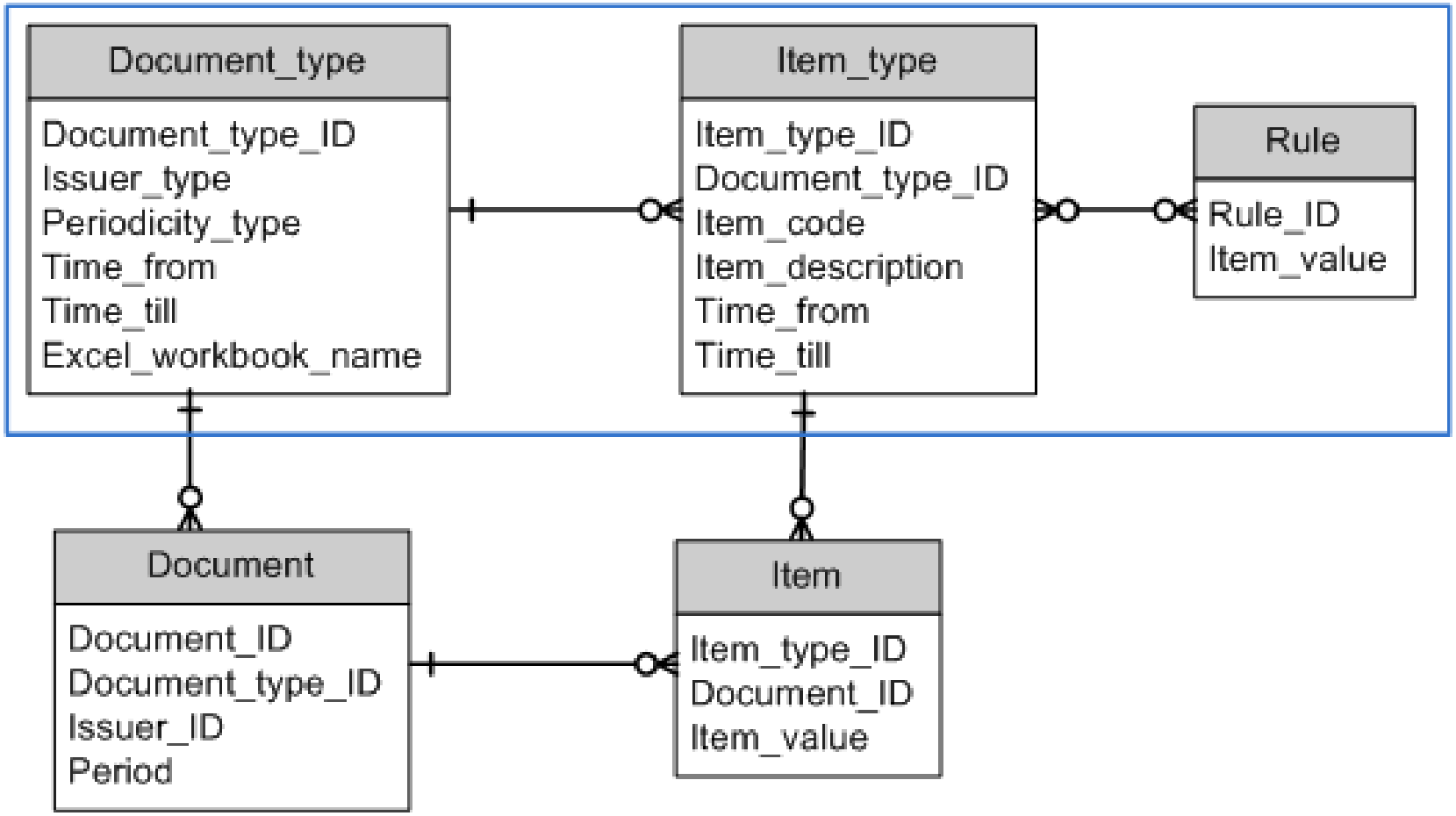


a) Input document template's schema



b) Report template's schema

Conceptual schema of ontology and data



Results

- System I
  - Types of input documents: 205
  - Types of reports: 1397
- System II
  - Types of input documents : 132
  - Types of reports: 185

Conclusions

- Complexity of interface design and usability testing transits from IT department to the end-users
- Testing of each new interface become simplier
- Front-end software is more complex but more reliable, too

- Users get the system that more corresponds to their needs:
  - Users use the tool that they know very well (MS Excel)
  - Users discuss and design desirable interface with minimal consultations from IT specialists
  - Users get the interface that is exactly the same as it was designed by them.

Questions?

Conceptual Schema of Ontology