Hogeschool van Arnhem en Nijmegen
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Webapplicatie-generatie

NIOC 2013

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Research Group Model Based Information Systems

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Presentation

- Introduction M-BIS
- Data intensive systems
- Requirements
- Generation techniques
- Building a generator
- Conclusion

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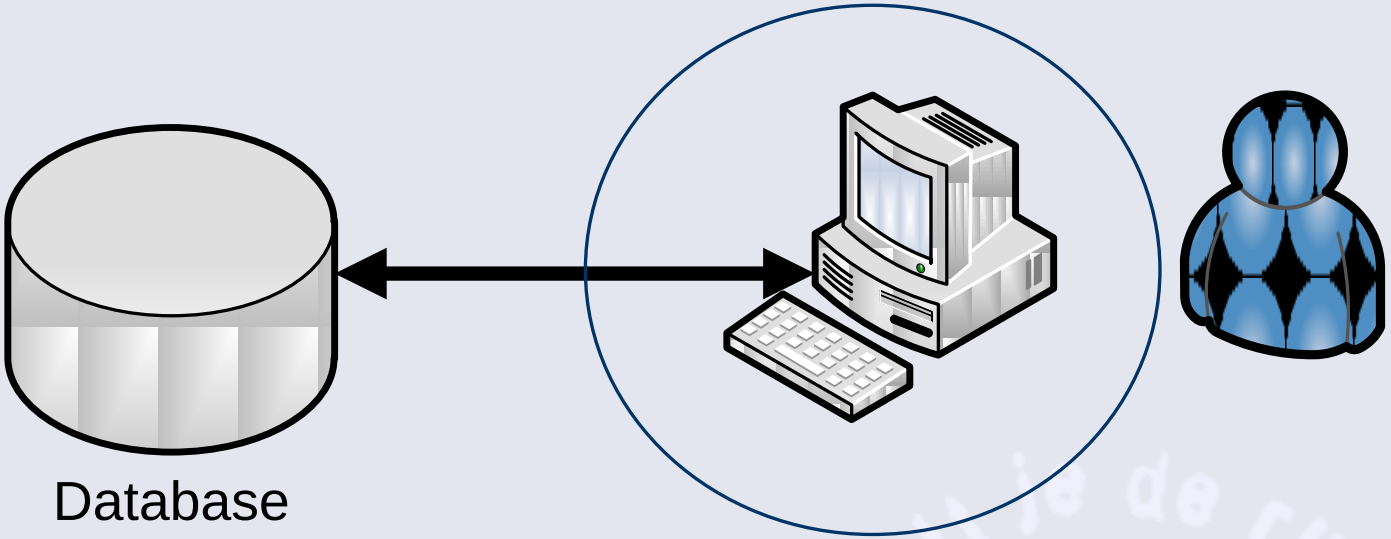
Introduction MBIS

- HAN University of Applied Sciences
- Information Communication Academy
- Lecturers bachelor & master:
  - Information modeling
  - Databases
  - Web technology
- Research group: Model Based Information Systems
  - Education: ER/FCO-IM, Business Intelligence (DV, Anchor)
  - Tools: modeling & application generation
  - Projects: faculty information systems

Data intensive application



- 100+ tables, 1000+ records, 10000+ users
- 100+ complex business rules

Generator requirements

- Main menu
- CREATE, READ, UPDATE, DELETE, SEARCH
- Simple reporting & exporting
- Single point of definition
- Reduce development & maintenance costs

- One programming language SQL
- No knowledge of C#, ASP.NET, Ajax, Javascript
- High performance
- Web based, security, personalization, multilingual

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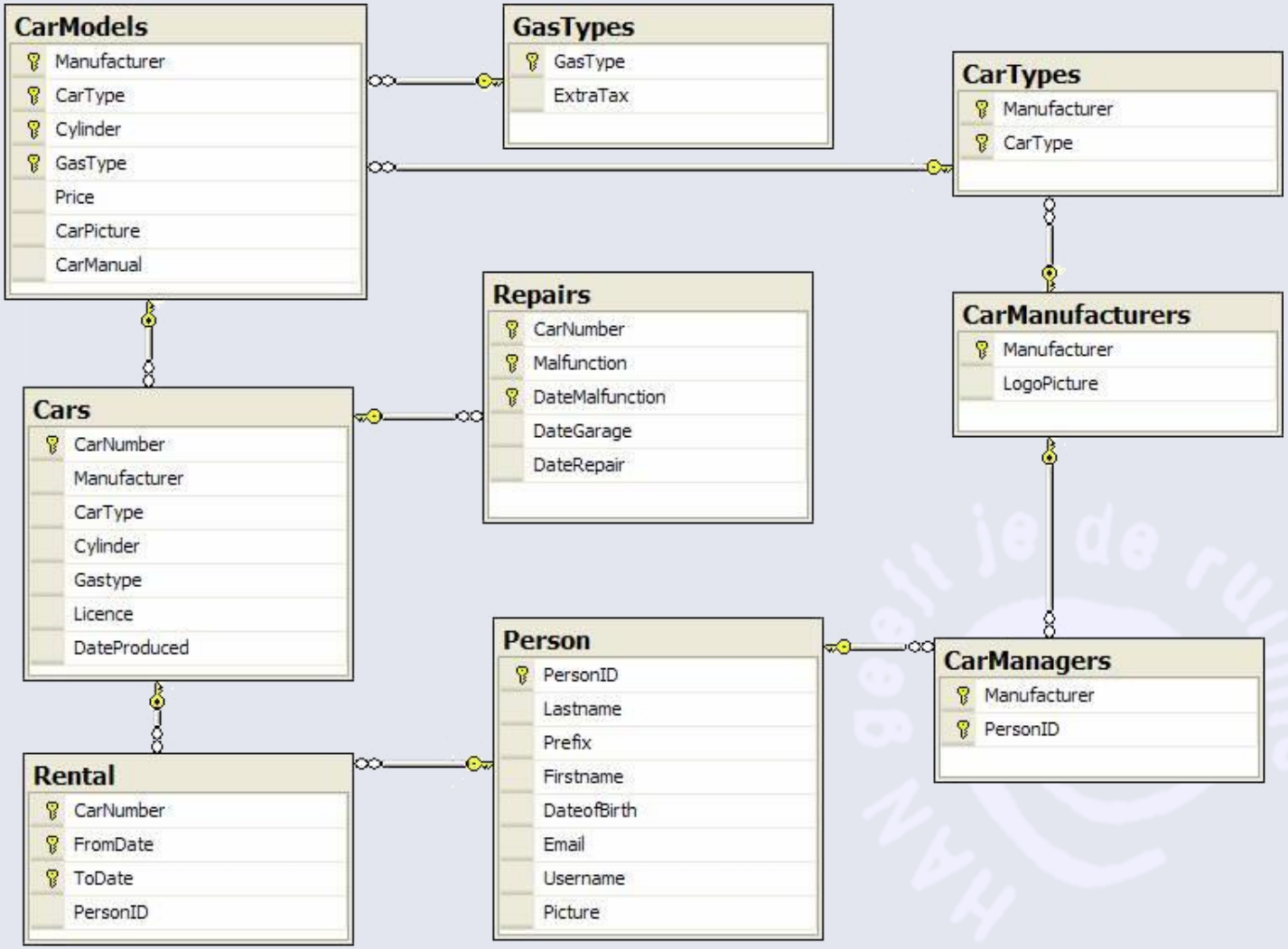
Demo model



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Use system repository

```
SELECT * FROM INFORMATION_SCHEMA.COLUMNS
WHERE TABLE_NAME = 'Rental'
```

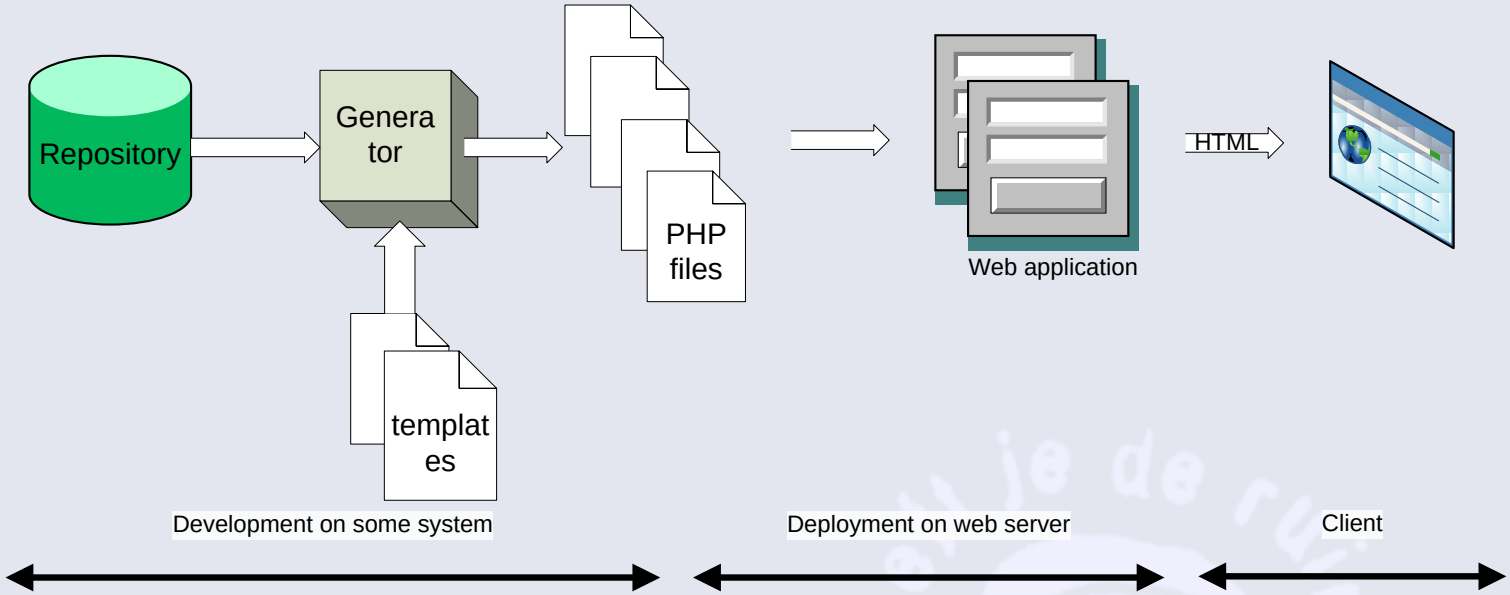
Table	Column	Seq	Default	Nullable	Type	Length
Rental	CarNumber	1	NULL	NO	varchar	20
Rental	PersonID	2	NULL	NO	int	NULL
Rental	FromDate	3	NULL	NO	datetime	NULL
Rental	ToDate	4	NULL	NO	datetime	NULL

- **Building query**
- **Generating forms**

Types of generators

- Code generators
  - Produce code file(s)
  - More than one target language (php, asp, asp.net)
  - Deploy later
  - Final application is run by compiled code in file(s)
- Runtime generators or interpreters
  - Direct read of repository
  - Runtime adaptation of system possible
  - Often platform limited

(PHP) Code generator basics



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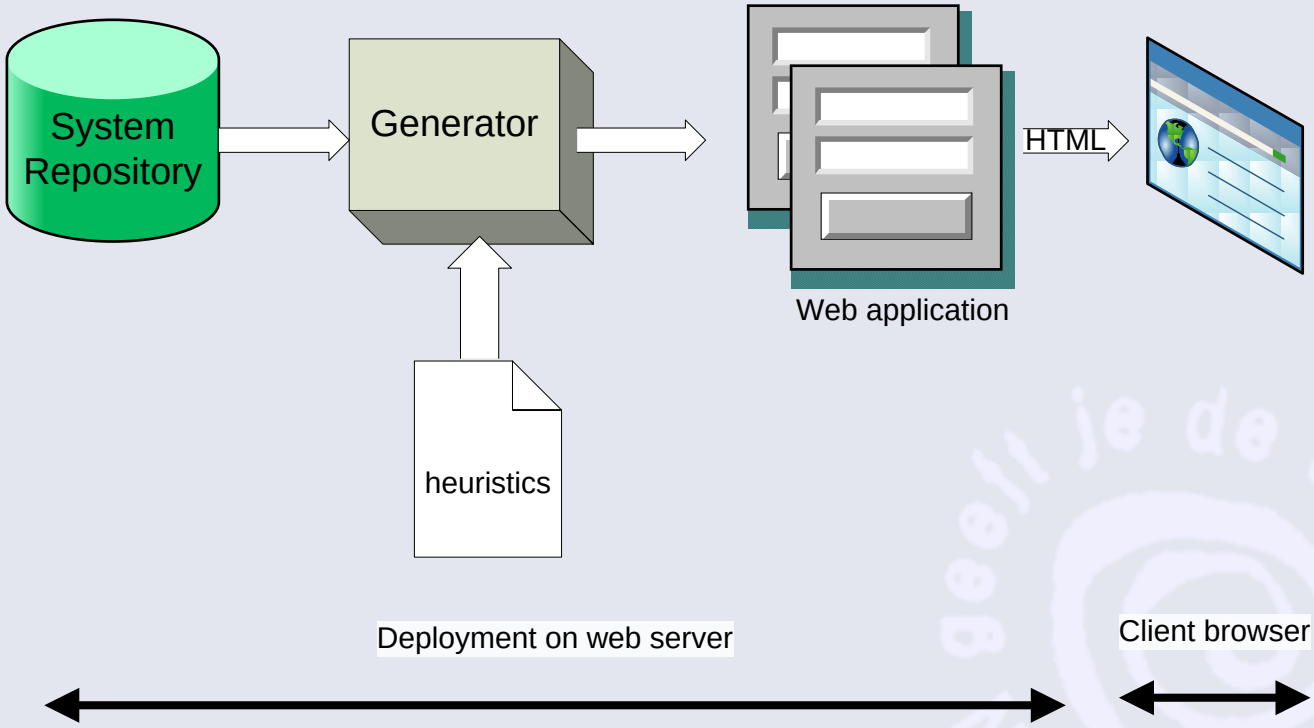
Runtime generation/interpretation basics



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Standard functionality of Information Model Application Generating Engine

- Browse
- Default presentation & panels
- Insert, edit: validation, combo boxes
- Search: auto fill
- Master – detail
- Navigation
- Audit
- Export
- Personalization

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Demo

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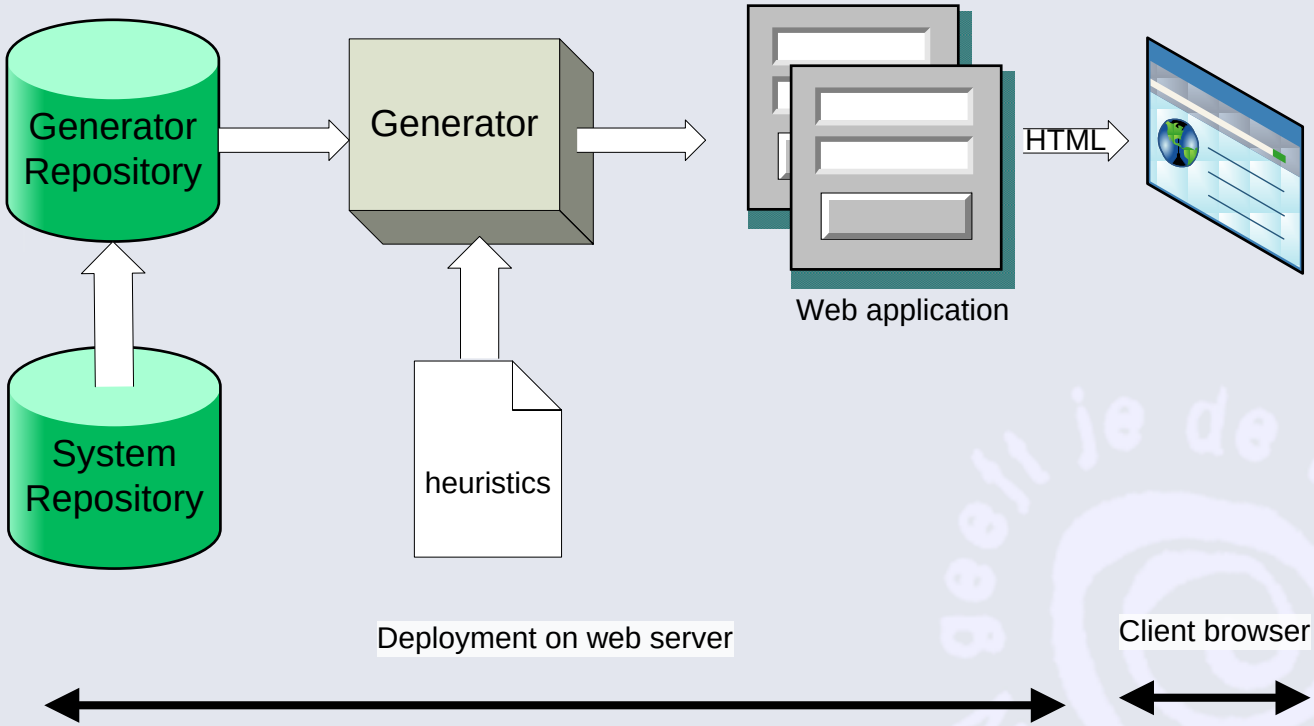
IMAGine at HAN

- Bachelor semester “Develop an Information System”
- Tool for business requirements specification & validation
- Tool for prototype/proof of concept
- Tool for production systems of ICA & HAN
- In projects use of commercial products like:
  - Thinkwise
  - Mendix

Adding dedicated repository



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Extended IMAGine functionality

- New data types e.g. email, picture
- Icons, panels, column positions
- Titles & messages, multi lingual
- Column & row rights
- Tasks
- Management reports
- Export/Excel reports
- Column colors depend on business rules

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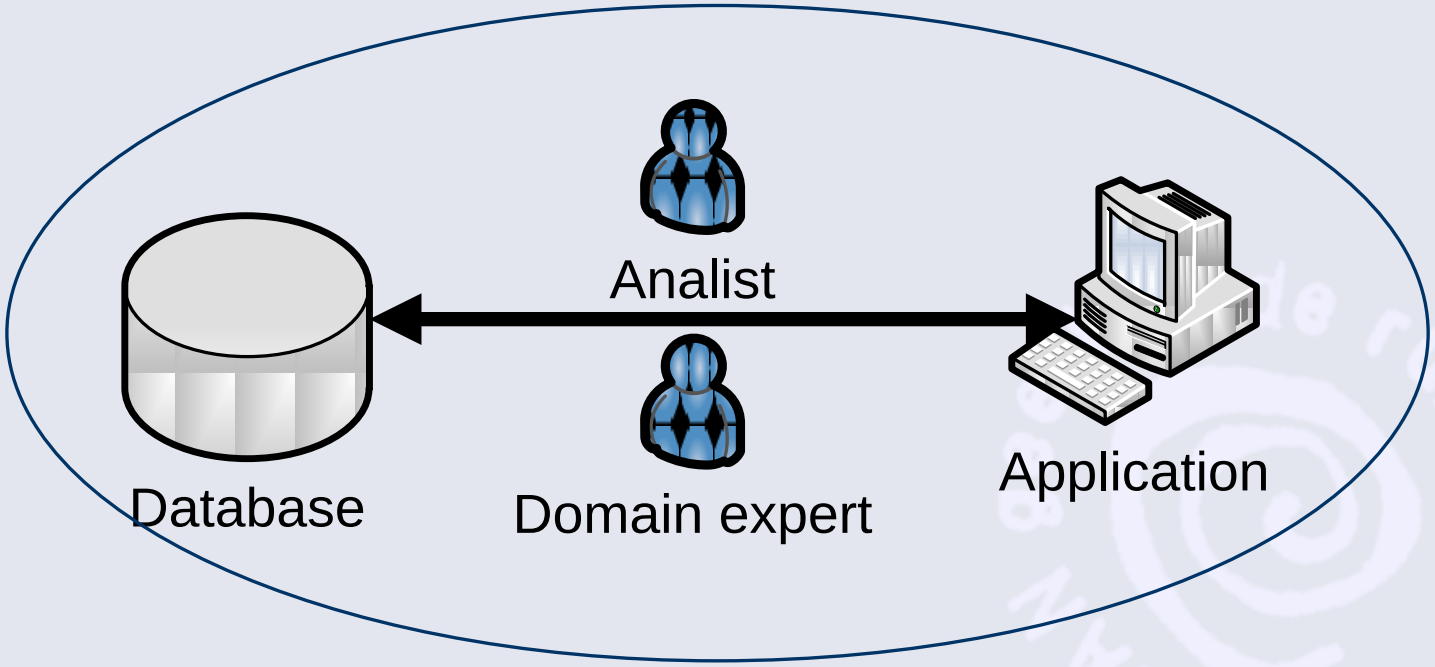
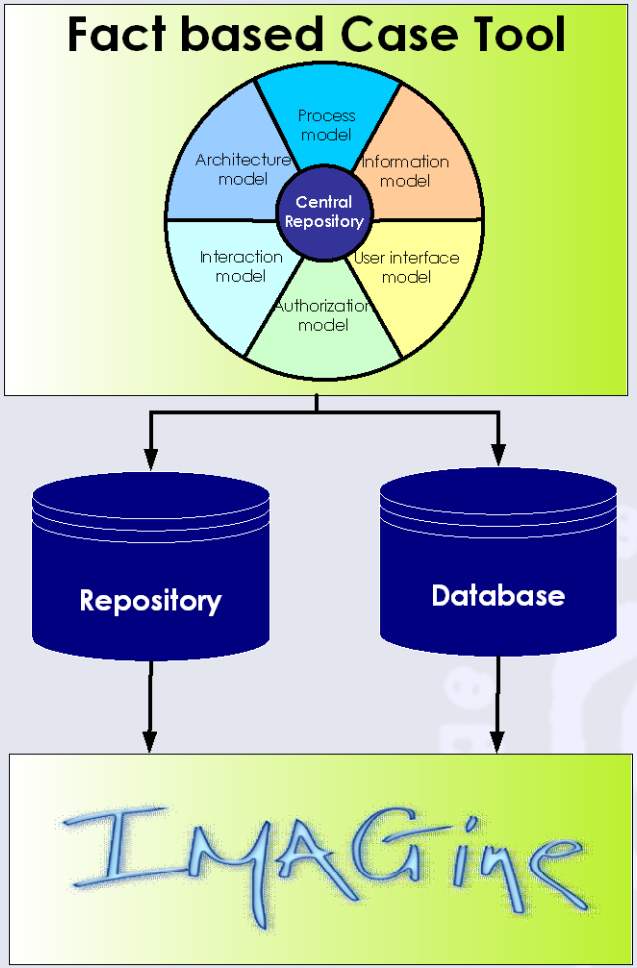
Demo

Integrated data & application modeling



Future developments



Future developments

- Integration with modeling tool
- Intra form constraints
- Integration of graphical data
- Smaller engine, more in DB
- XML as interchange format
- More flexible UI e.g. panel in panel, grid in panel, buttons behind controls
- More proces integration

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Docenten (Technische) Informatica

- 2 FTE
- U hebt een relevante wo- of hbo-masteropleiding. U bent een ervaren informaticaspecialist met relevante werkervaring, opgedaan in het bedrijfsleven. We zoeken collega's die flexibel inzetbaar zijn voor onderwijs in zowel technische als niet-technische informatica en goed thuis zijn op zoveel mogelijk van deze terreinen: (Embedded) Software Engineering, kennis van OO-programmeertalen bijvoorbeeld Java, C#, C++, UML voor analyse en ontwerp van systemen en embedded media objects. U hebt visie en een verfrissende kijk op uw vakgebied. U bent creatief en ondernemend en hebt uitstekende didactische, sociale en communicatieve vaardigheden. Omdat van hogeschooldocenten tevens verwacht wordt dat zij onderzoek verrichten, is affiniteit met en/of ervaring in het uitvoeren van onderzoek een pre.