

# On ADLs and tool support for documenting view-based architectural descriptions

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## DistriNet Labs

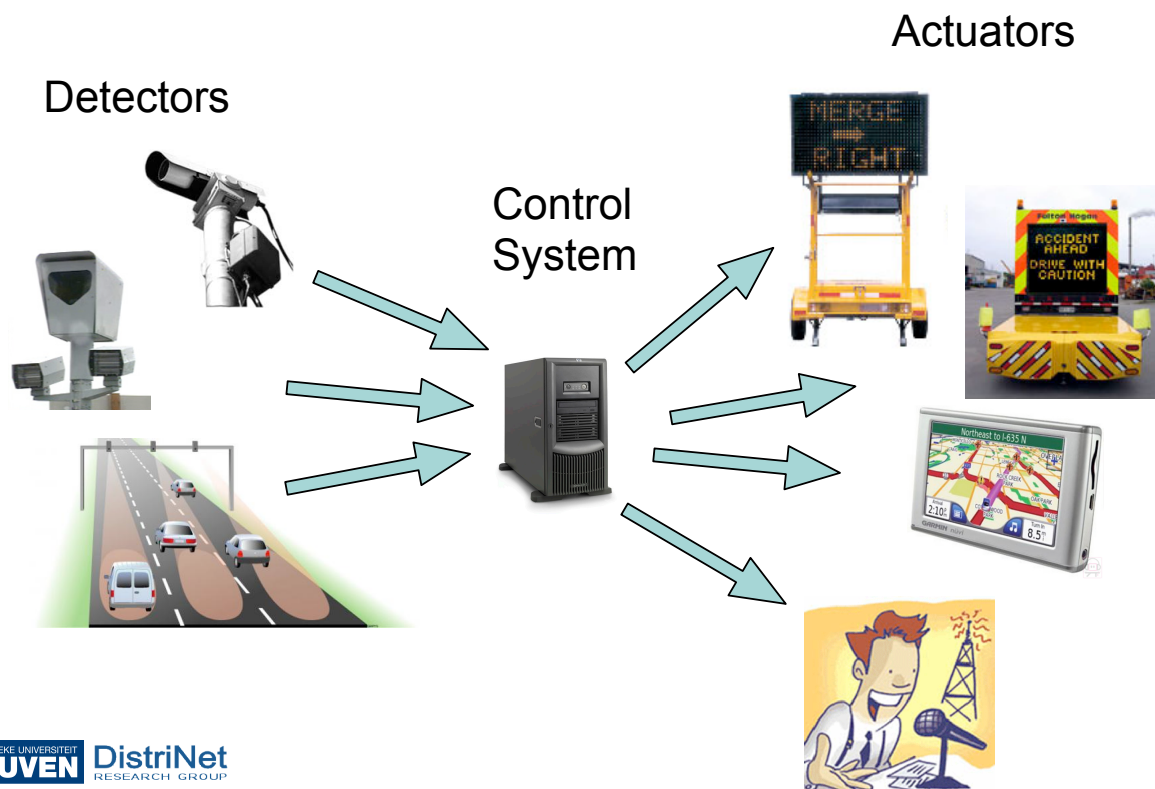
- @ Dept. Computer Science K.U. Leuven
- +60 researchers
- Advanced open and distributed software
- Decentralized software architectures



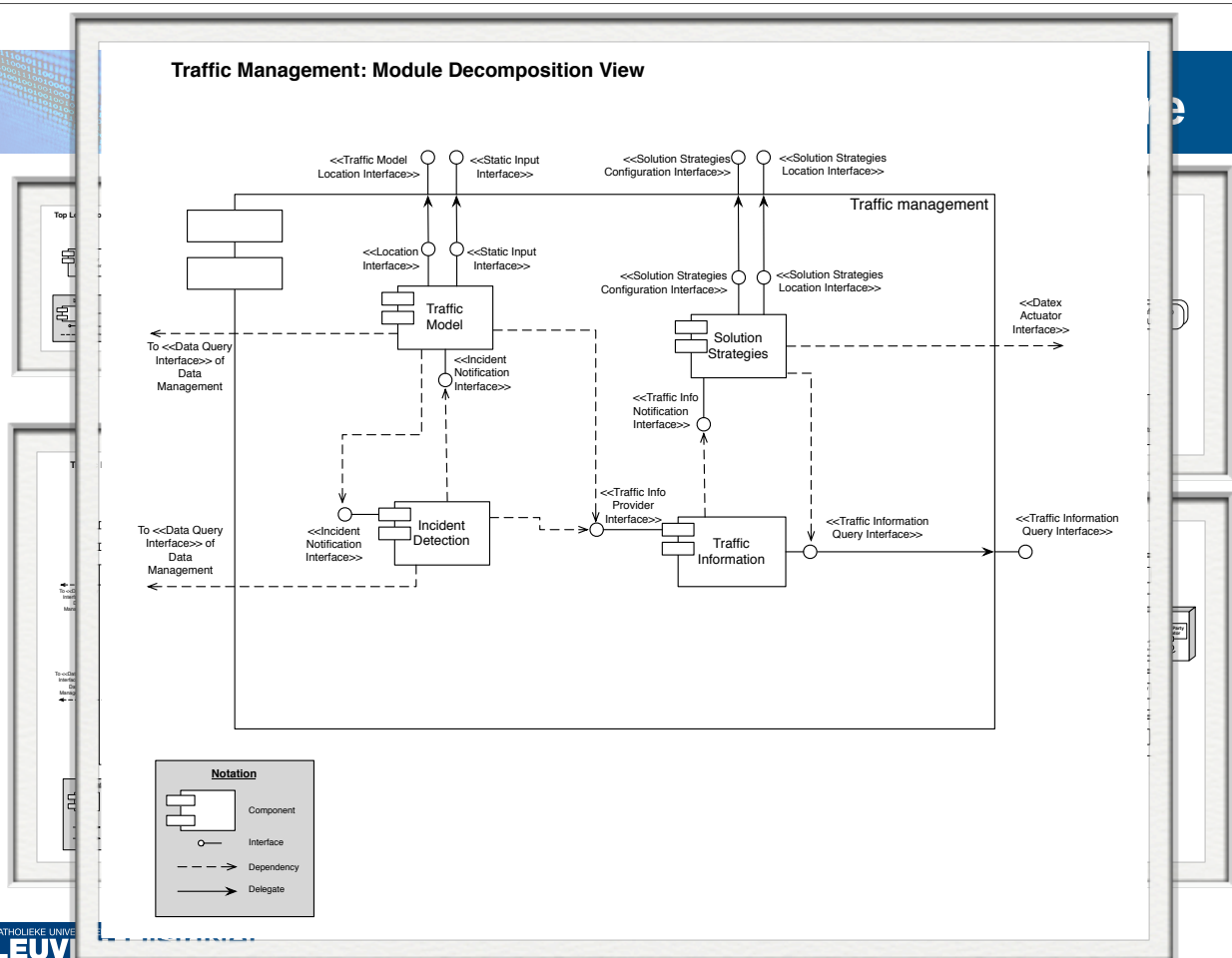
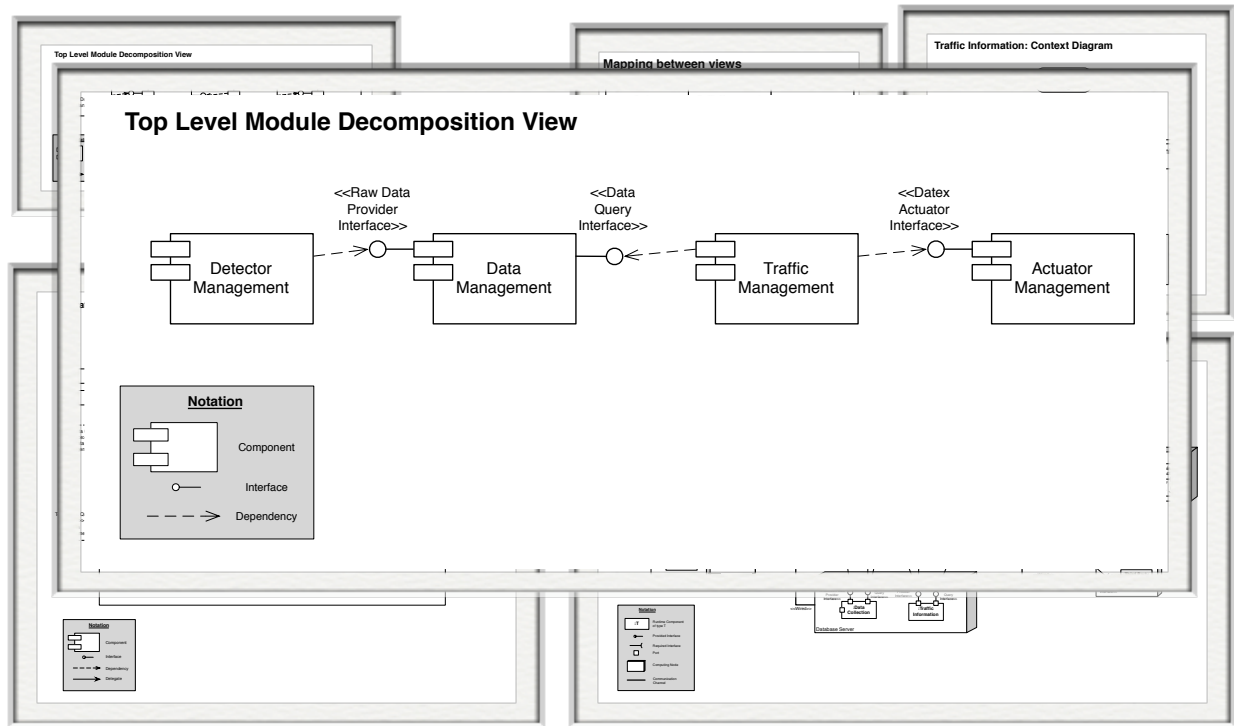
# Outline

- Case
- Problems with view-based architectural documentation
- First step towards a solution
- Reflection & conclusions

## Case: Traffic Control System



# View-Based Documentation of Architecture



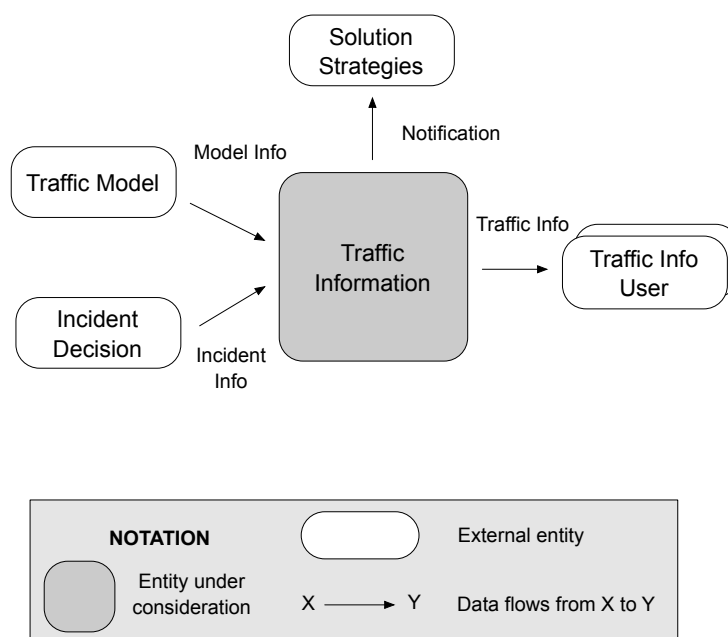
# View-Based Documentation of Architecture

## Mapping between views

System Module Decomposition View Element	Traffic Management Module Decomposition View Element	Relation
Detector Management	...	The elements from the System Module Decomposition View contain the modules from the Traffic Management Decomposition View
Data Management	...	
Traffic Management	<ul style="list-style-type: none"> <li>- Traffic Model</li> <li>- Incident Detection</li> <li>- Solutions Strategies</li> <li>- Traffic Information</li> </ul>	
Actuator Management	...	

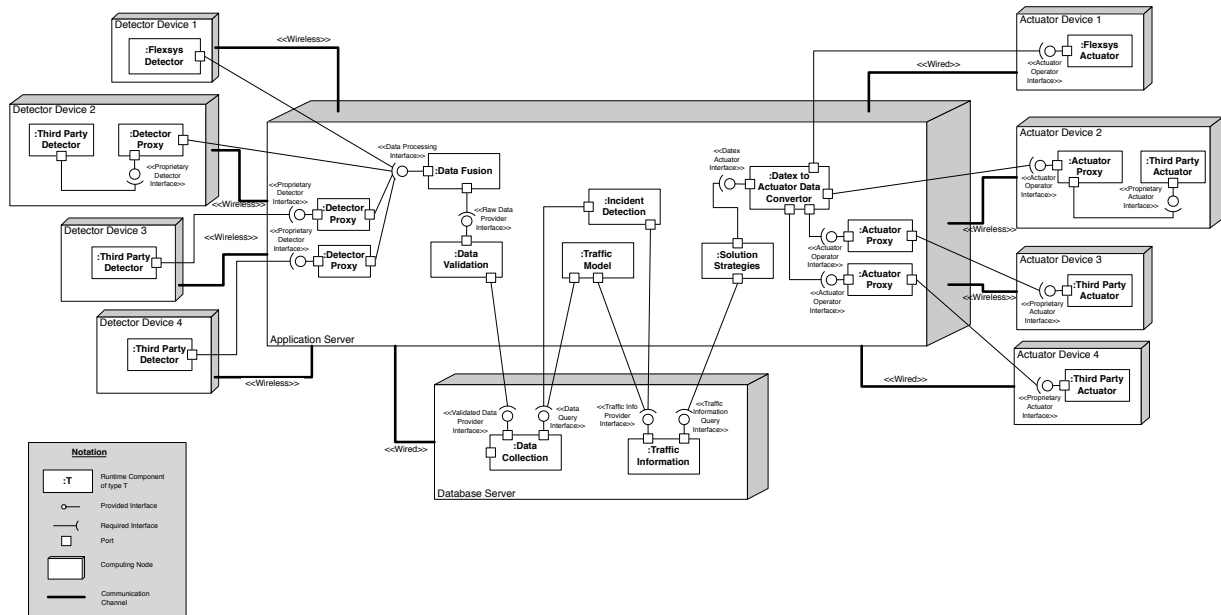
# View-Based Documentation of Architecture

## Traffic Information: Context Diagram



# View-Based Documentation of Architecture

Overlay View

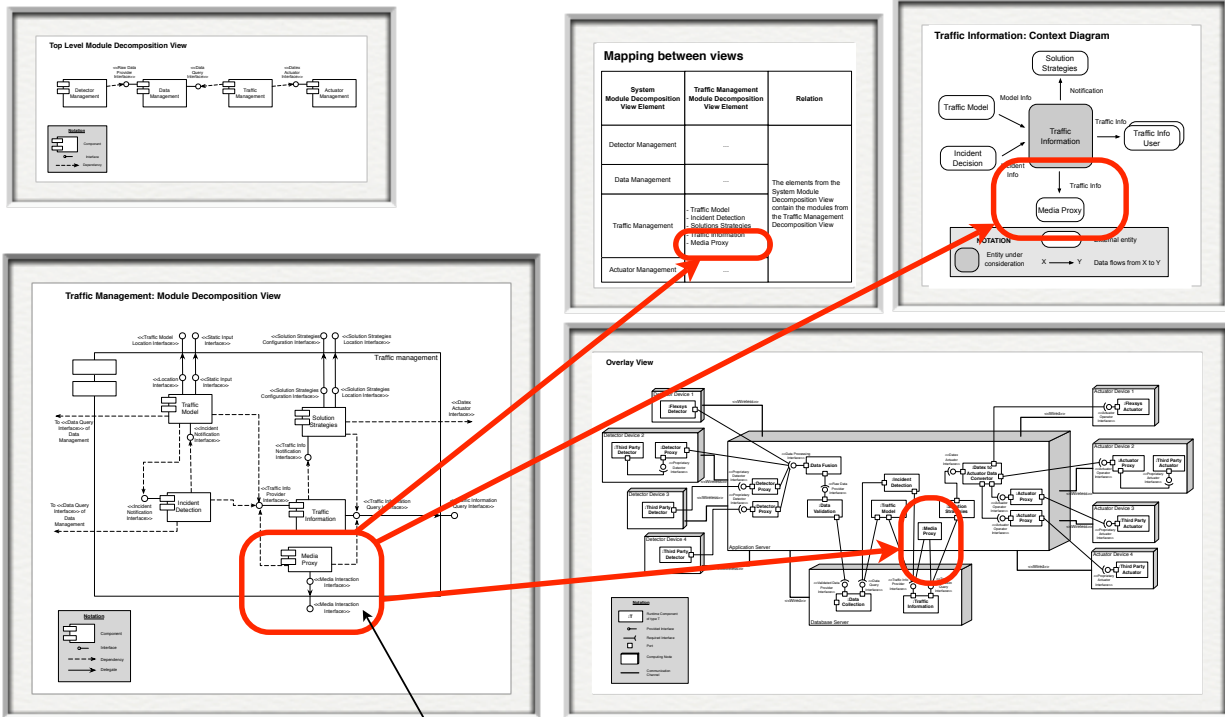


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# Update View-Based Documentation



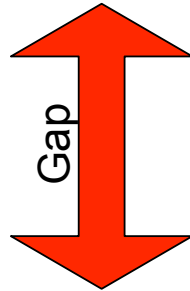
Add module: Media Proxy

# Applying Views & Beyond can be hard

- Maintaining consistency among
  - Views
  - Mapping between views
  - Related view packets (parent/child; sibling)
  - Context diagrams
  - Overlays
  - Elements directory
  - Glossary
  - ...
- But also analysis & verification, traceability, etc.

## The Underlying Problem

Common agreement:  
software architecture should be  
documented with multiple views



Lack of ADLs and Tools with  
explicit support for views &  
view relations

Our experience:  
documenting view-based  
descriptions is hard

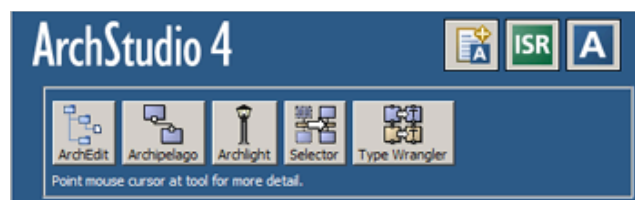
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## First Step Towards a Solution

- Extending existing ADL/Tool with support for
  - Views
  - View relations
- Current focus
  - xADL and ArchStudio
  - Structural views + basic relations
  - Formal foundation
- Cases
  - Prototype applications
  - Projects with industry
    - Logistics
    - Traffic control (Flexsys project)

## Demo







## Outline

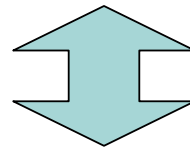
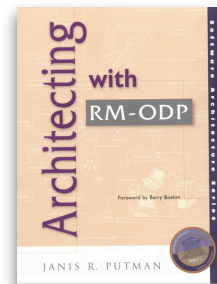
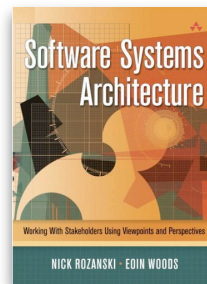
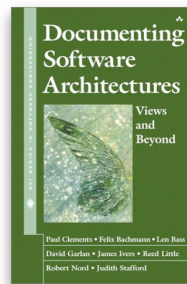
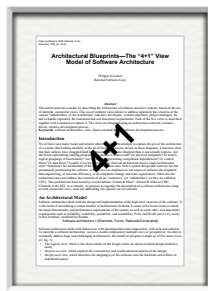
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## Reflection

- Large body of work on views & view relations
  - Need for promoting views & view relations as first-class citizens in ADLs
- ADLs & Tools amplify the power of views & view relations
  - Automated consistency checking
  - On-the-fly composition of views
- Supporting views & view relations is complex
  - Relating views  $\approx$  relating stakeholder perspectives
  - Heterogeneity of multi-view specifications
  - Formalizing the specification

# Conclusion



Bridging the gap

