

Involving Business Users in the Design of Complex Event Processing Systems

*Christian Seel
Software AG, Research Projects
Saarbrücken, Germany*

Agenda

Introduction

- Problem area, motivation, terminology



Application Scenario & Concept

- Conceptual and technical event modeling



Conclusion & Outlook

- Quintessence of the talk
- Further research

Introduction & Motivation

What are complex events?

Why do we need conceptual modeling of complex events?

The CEP constitutes a new paradigm in business information technology



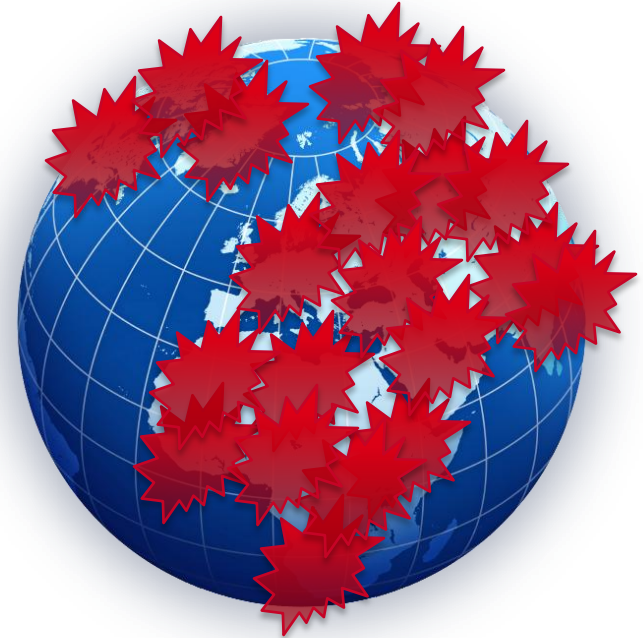
Sensor networks and RFID tags provide information about events ...



... everywhere in real time, thus creating a world-wide **event cloud**.

The CEP constitutes a new paradigm in business information technology

- Challenges:
 - How can event patterns be recognized?
 - How to deal with situations detected by event patterns?
 - How can situation-specific data be connected to business processes?



Terminology of Complex Event Processing

- **Event**

data representation of a real-world happening, e.g.



- **Complex Event**

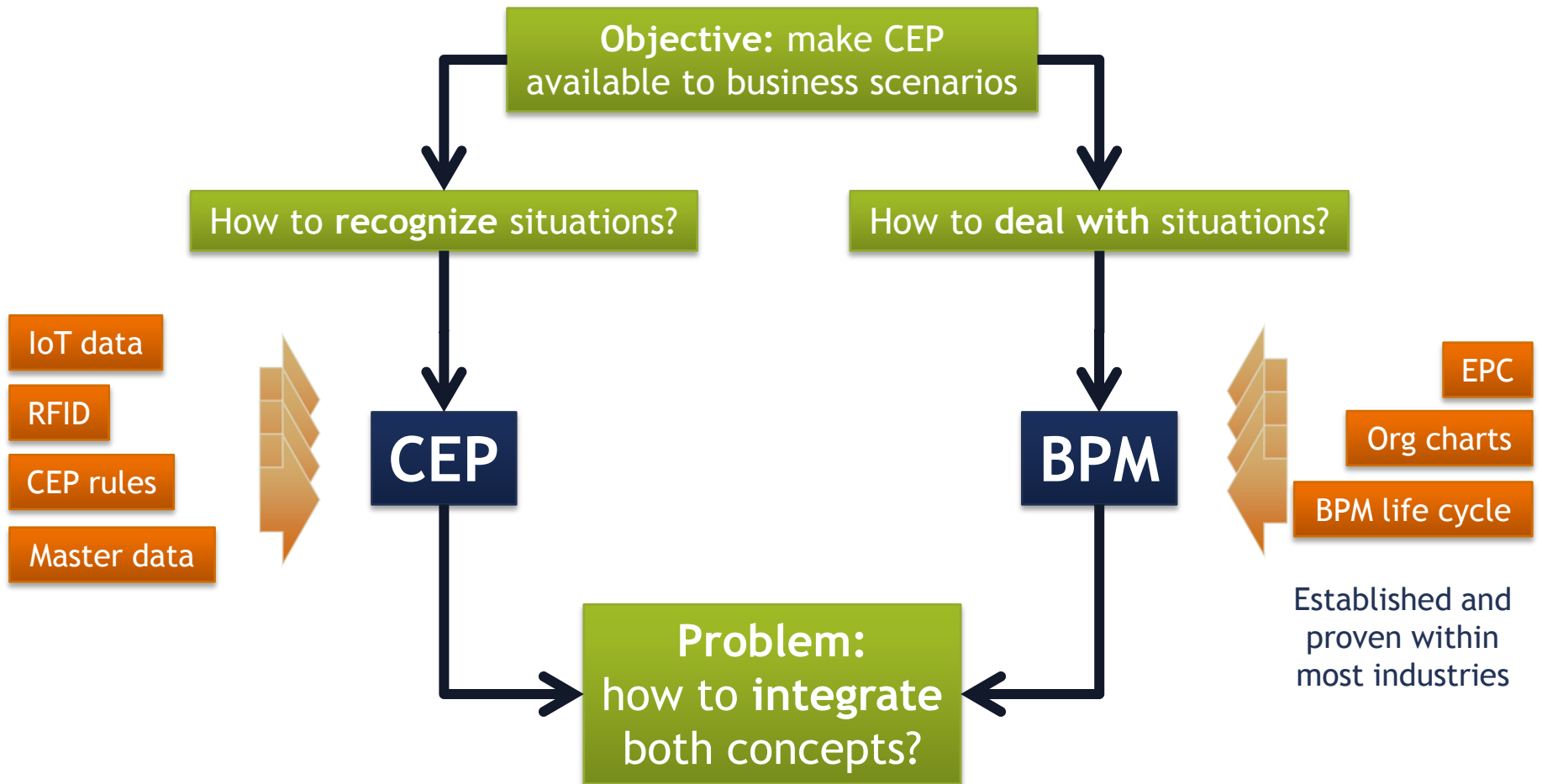
summary/aggregation of many “simple” events, e.g.



- **Complex Event Processing (CEP)**

process of aggregating a set of events according to a predefined rule

How can we make CEP available to business applications?



BPM and CEP follow different paradigms that must be integrated

Business Process Modeling

- Business process models specify control flows
 - ▶ **Process** = clearly defined task sequence
 - ▶ **Execution** = working off all tasks one by one



**Process-driven
Approach**

Complex Event Modeling

- CEP models specify situations
 - ▶ **Situation** = constellation of events
 - ▶ **Reaction** = signaling the situation by firing one or more complex events



**Event-driven
Approach**

Any approach to integrate BPM and CEP must support established organizational division of labor

Conceptual Modeling

- Corporate, process and IT strategy
- Business structure, processes and responsibilities
- Legal and financial requirements
- Budgeting and cost accounting



Business Knowledge
is required

Technical Modeling

- Application systems and their interfaces and APIs
- Network connections
- Security considerations
- Performance requirements

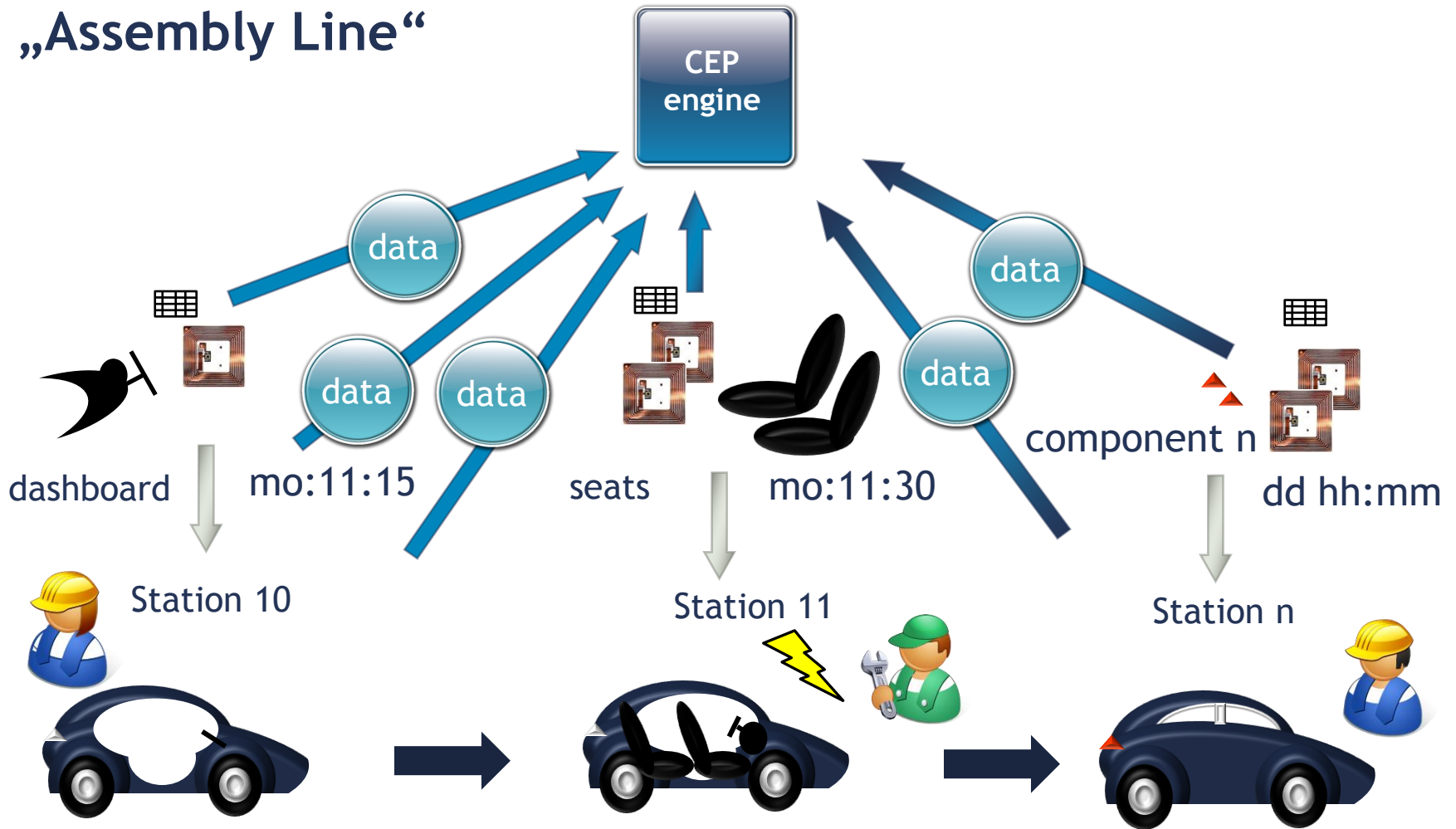


Technical Knowledge
is required

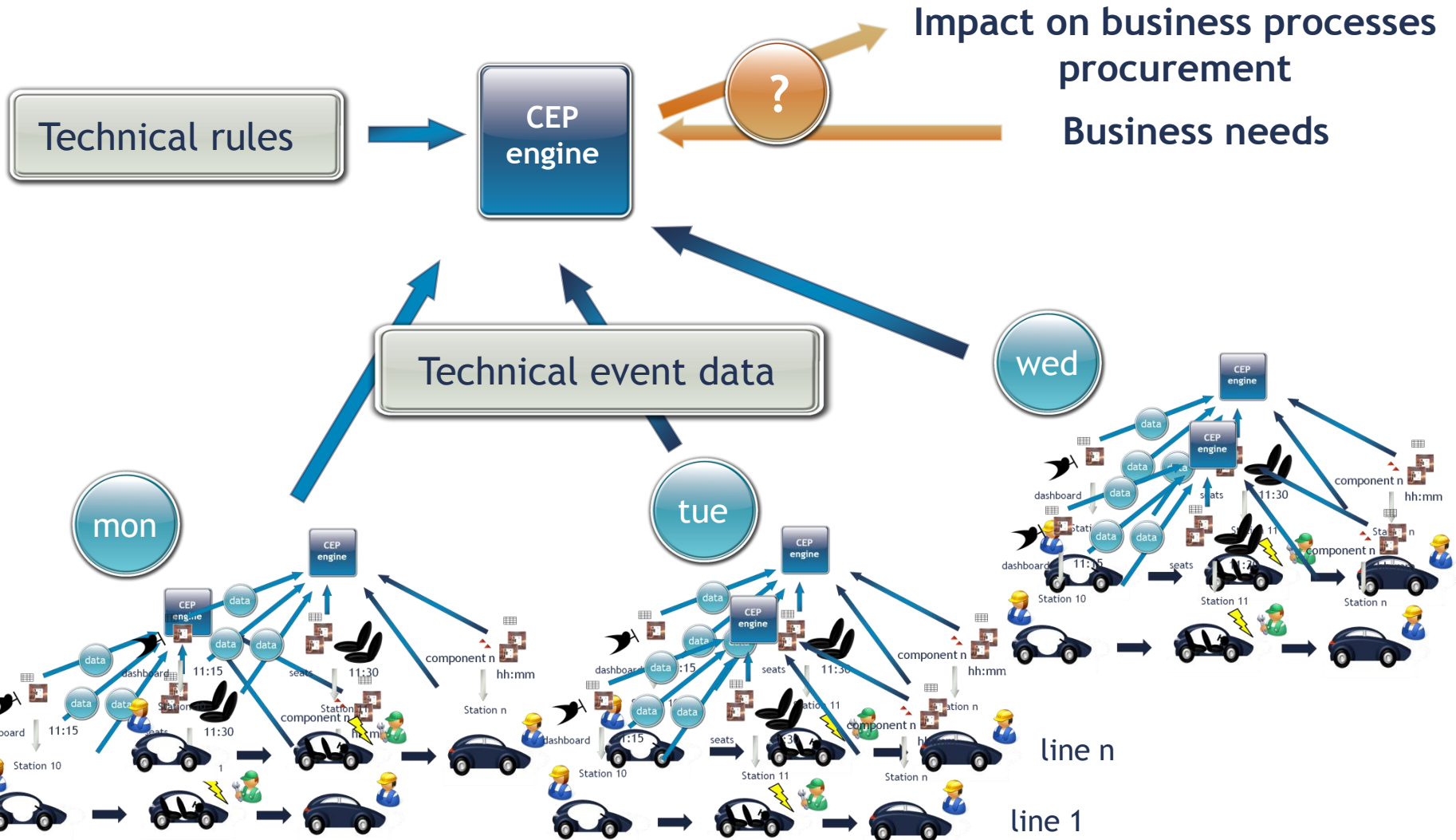
Application Scenario

Conceptual CEP modeling by example

Application Scenario „Assembly Line“



Same scenario, larger scale



The proposed CEP modeling approach bridges the gap between business and IT view

Conceptual Event Modeling

- specifies how CEP is integrated into daily work
 - ▶ Which event constellation describes a complex situation in a meaningful way?
 - ▶ What process is triggered by a complex event?



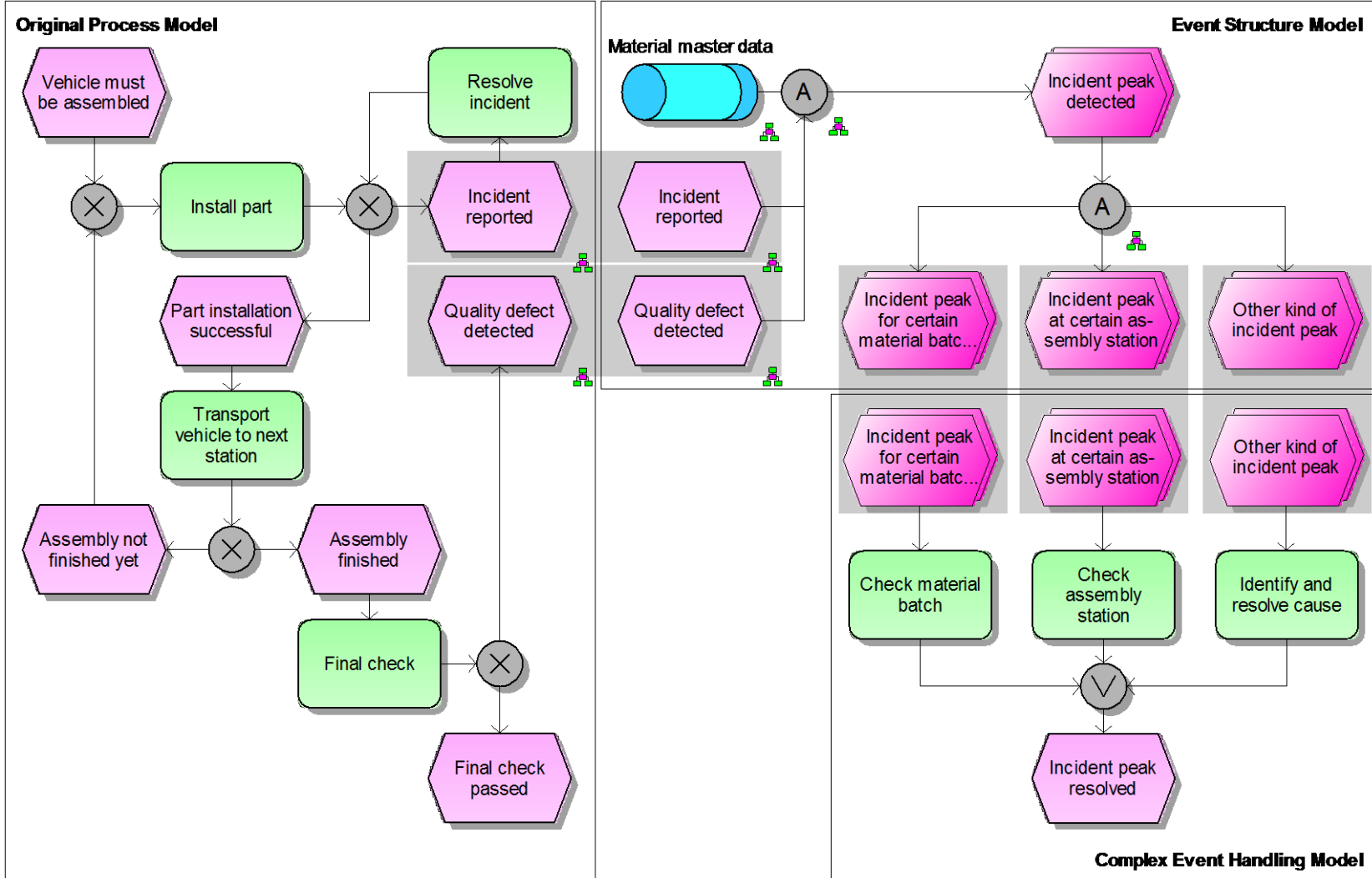
**Focus on
CEP Application**

Technical Event Modeling

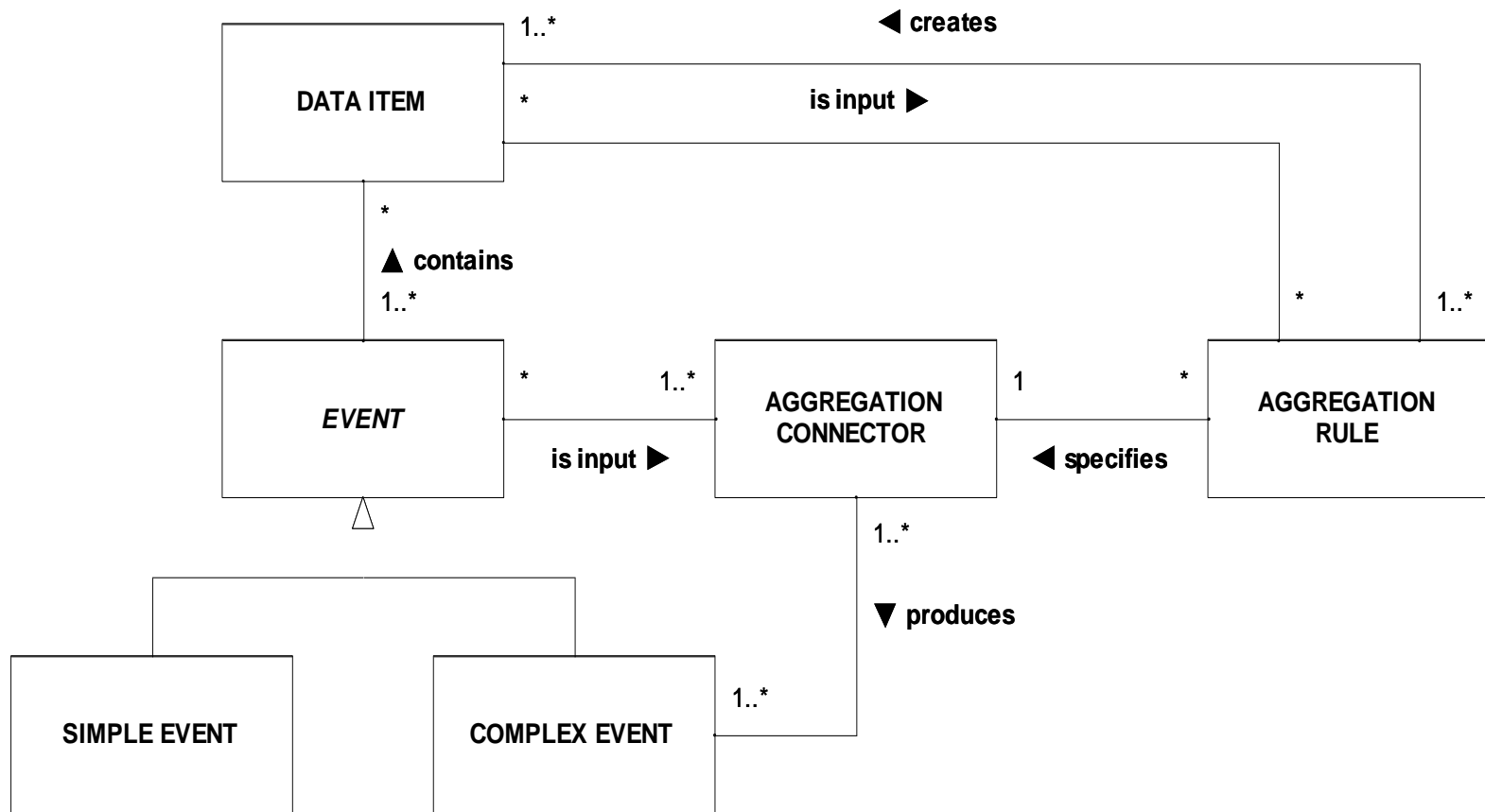
- deals with technical implementation of CEP rules
 - ▶ What are information sources that deliver events?
 - ▶ How to convert data formats?
 - ▶ How are events technically aggregated to complex events?



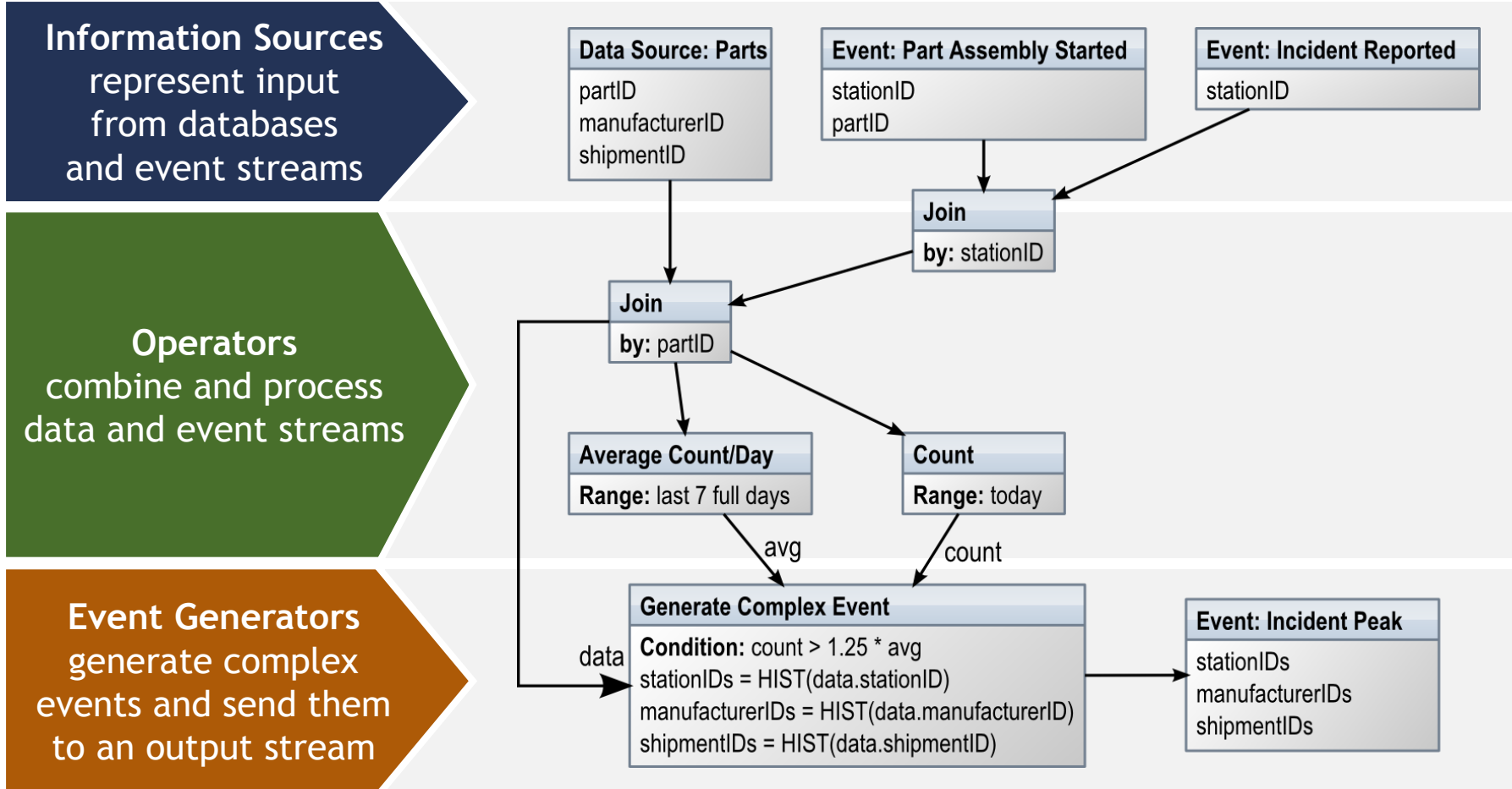
**Focus on
CEP Implementation**



Meta model of the Event Structure Model (ESM)



Technical Modeling



Conclusion & Outlook

What did we show? What will come next?

Conclusion and Outlook

Conclusion

- A conceptual modeling method for complex events was defined in order to detect exceptional situations in business processes
- Event-driven Process Chain was extended by business relevant complex events to define reaction processes on detected exceptional situations
- Distinction between conceptual and technical complex event modeling allows for a separation of business logic and its realization in a CEP engine

Outlook

- Realization of a prototypical implementation for the research project „ADiWa“ (funded by the German Federal Ministry of Education and Research)
- Evaluation of additional scenarios in various business areas (logistics, mechanical engineering, retail, production)

Thank You! Questions?

DR. CHRISTIAN SEEL

Software AG
Saarbrücken, Germany