SensIDL

Towards a generic framework for implementing sensor communication interfaces

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FZI

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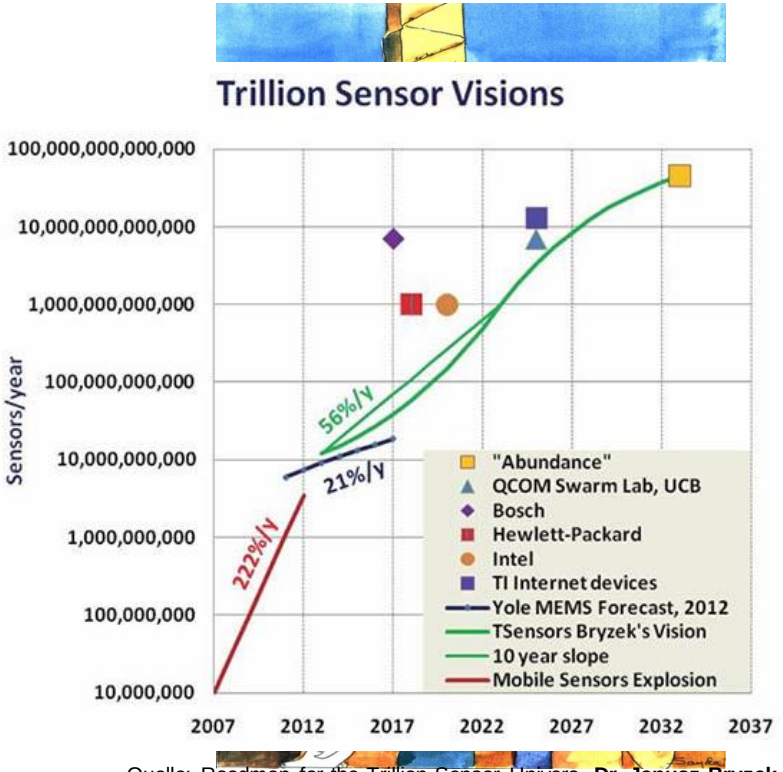
Motivation

Communication requires

- A common understanding
- A common language

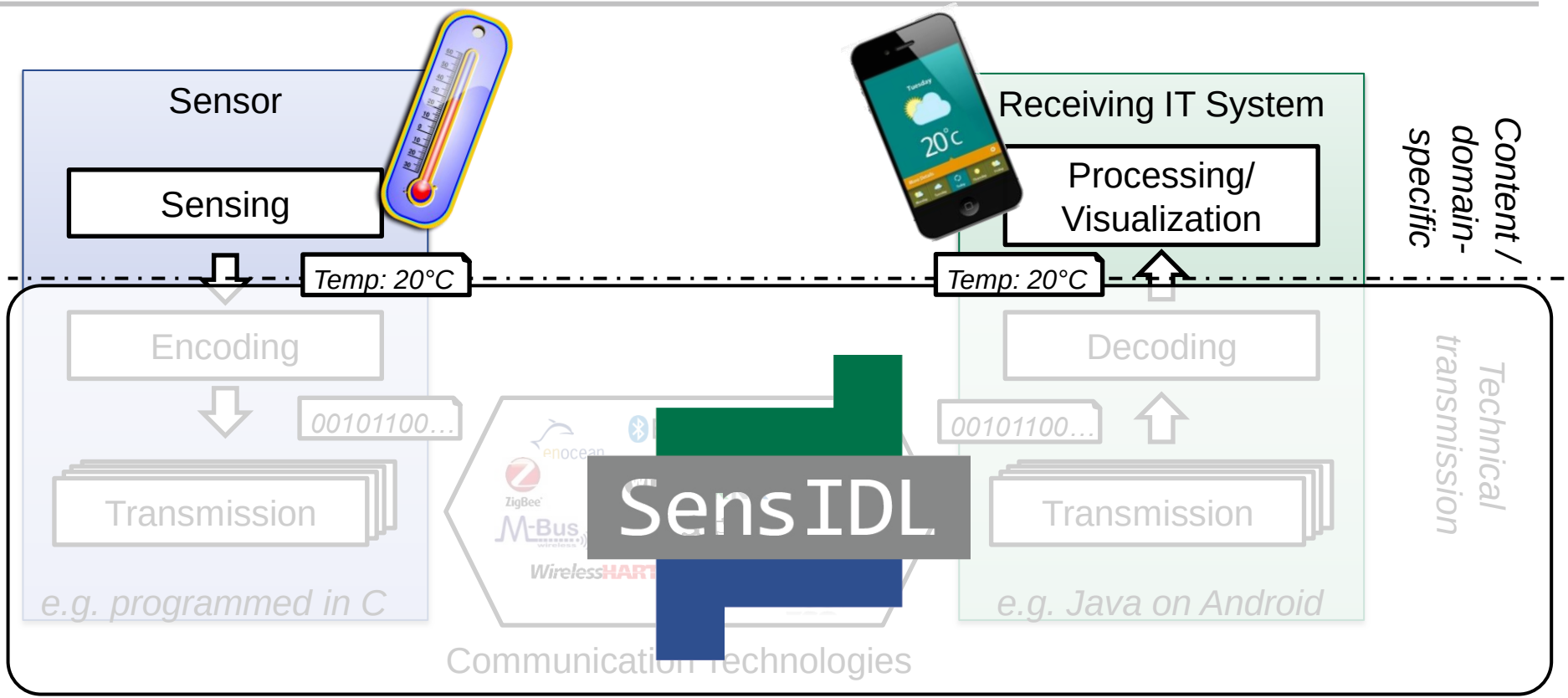
Continuing growth of connected and communicating sensors

- Industrie 4.0
- Smart Home
- Internet of Things



Quelle: Roadmap for the Trillion Sensor Univers, **Dr. Janusz Bryzek,** Fairchild Semiconductor, Chair of TSensors Summit

Babylonian sensor confusion



Goals of SensIDL

- **Common understanding and language for describing sensor interfaces**
- **Eased and faster implementation of sensor interfaces**

Image source: http://blog.conqueryourdebt.org/2013/08/14/how-to-prepare-for-unexpected-medical-costs/toolbox-with-tools-skrewdriver-hammer-handsaw-and-wrench/

Objectives of SensIDL

Support for software developer

- Sensor and embedded developer as well as developer of IT-Systems
- Data processing within the receiving IT-system

Simplification and automation of development steps

- Tool support
- Generation of code
- Documentation with additional value

Increase of efficiency and quality

- Automation of recurring tasks
- Focusing on application-specific details

Expected SensIDL Results

5 Integrated tool chain

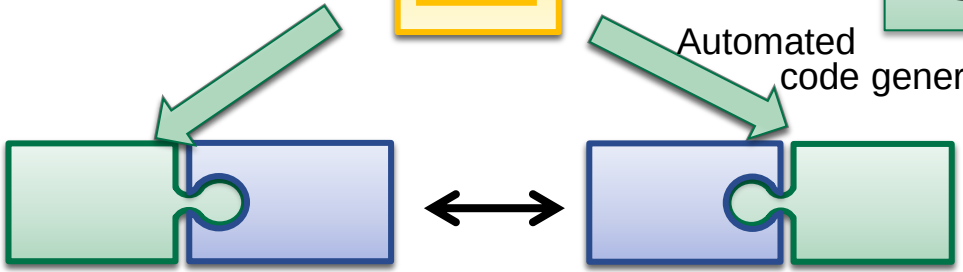
1 SensIDL Interface Description Language

Interface description

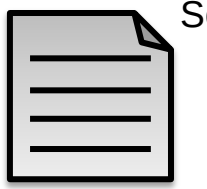
3 SensIDL Code Generators

Source code smart sensor

Automated code generation



Source code receiver



specific API

2 SensIDL Communication framework

specific API

4 Reference demonstrator

Adressed Issues

Interface description language

- Required an optional parts of interfaces
- Abstraction of implementation- and platform-specific details

Reference demonstrator

- Cover different apllication domains (e.g. Smart Home and Industry / Production)
- Basis to derive code generators

Adressed Issues

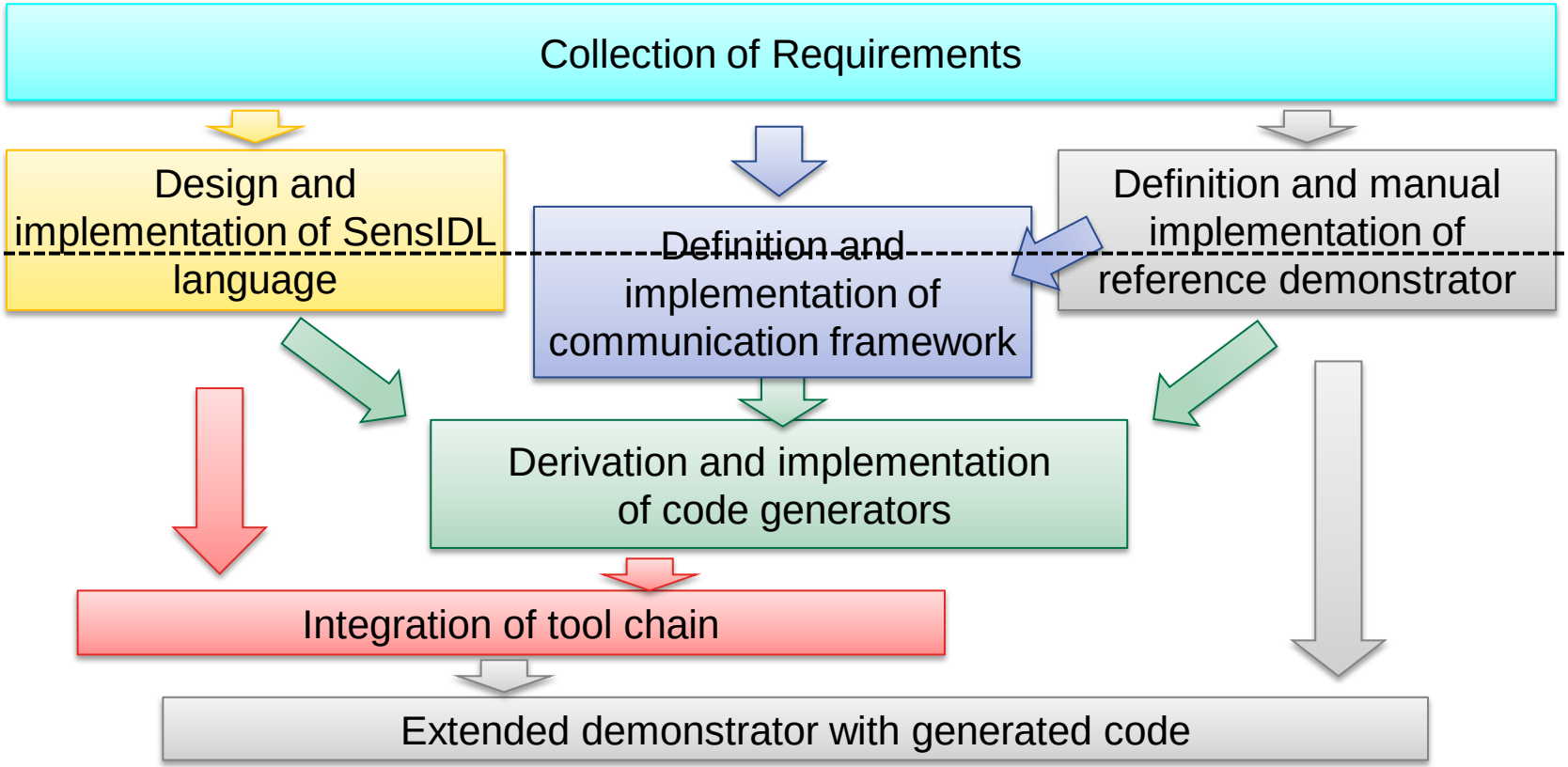
Communication

- Cover different communication styles, e.g. Packet-based, Stream-based, RPC-based
- Abstracting the communication technology and integration of existing low-level frameworks
- Energy efficiency on low-power devices

Code generators and automation

- Generality of existing code fragments
- Identification of recurring development tasks
- Integration in existing code, libraries and platforms

Project Roadmap



Used Technologies

SensIDL Tool

- Eclipse-based plugins
- Integrated tool chain

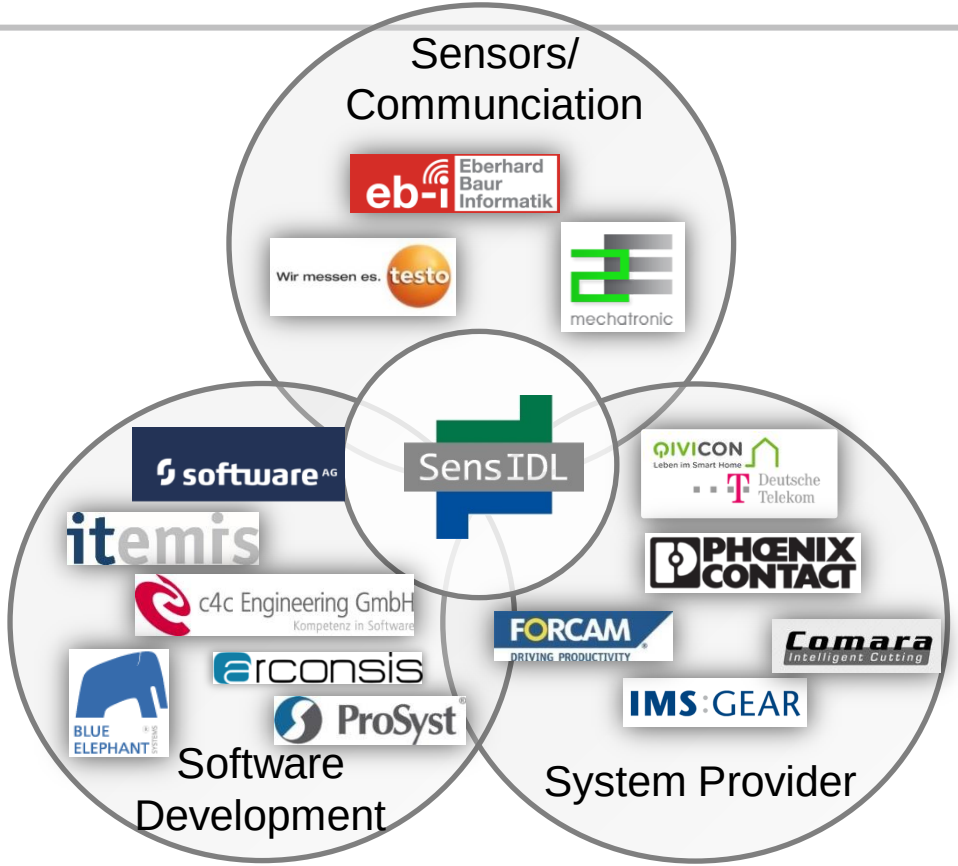
SensIDL Language

- Model / language for describing sensor data
- Textual editor based on Xtext
  - Optinal additional graphical editor

SensIDL Code Generators

- Code templates based on Xtend

Industrial Involvement

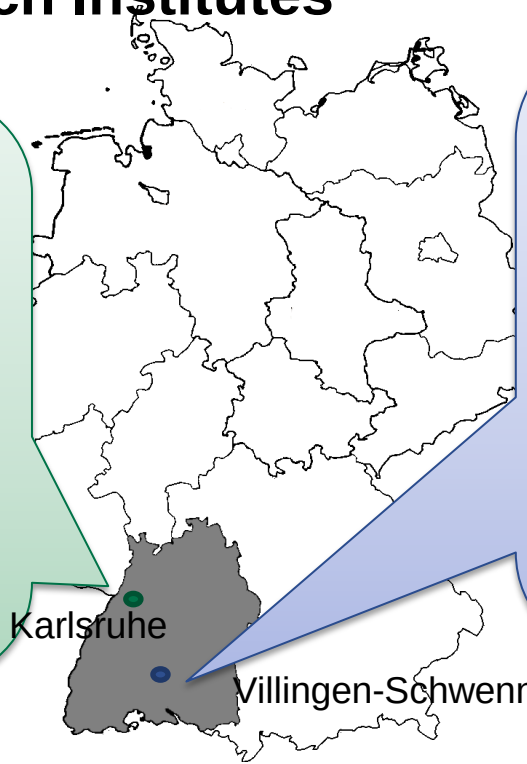


Who we are

Collaborating Research Institutes

Forschungszentrum Informatik (FZI)

- Software engineering
- Model-driven software development



Hahn-Schickard

- Embedded Software
- Energy efficient sensor systems
- Wireless communication

How we look like

Summary

SensIDL Tool

- Supporting the implementation of communication interfaces
- Based on model-driven rechniques

Current Status

- Requirements collected
- Communication Framework design started
- First prototype of SensIDL language

Outlook

- Initial funding until end of 2016
- Further represantative demonstrators
- Implementation based on reference demonstrators
- Extending the community

Questions?

http://www.sensidl.de

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