



6TH INTERNATIONAL

B2B SOFTWARE DAYS



THE FUTURE
OF DIGITAL
BUSINESS

10-12 MAY 2021

ONLINE



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EUREKA ITEA3 COMPACT

A journey of an Austrian SME

Experience Report from the Eureka Cluster Project COMPACT

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Agenda

- Who I am – Who we are
- What we do
- EUREKA ITEA3 COMPACT
 - Idea, Results, Outcome, Findings
- Resume

Peter Lieber

- Parallel Entrepreneur (14 companies (SparxSystems Central Europe, LieberLieber Software, ...)) in 5 countries (Austria, Switzerland, Estonia, Slovakia, USA))
 - Focus Industries: Software Industrie (Automotive, Aerospace, Space, Transportation, Defense, ..., Finance, Banking, Insurance)
 - But sometimes something completely different: „Bio Laden“ (bio products store) with a very modern approach in Klosterneuburg, Maria Lanzendorf and Deutsch Wagram (www.kredenz.me)
- Präsident Österreichischer Gewerbeverein (www.gewerbeverein.at)
- Präsident Verband Österreichischer Software Industrie (www.voesi.or.at)
- Präsident TGM Kuratorium (www.tgm.ac.at)



Sparx Systems
HQ



Sparx Systems
Sister&Service Companies



LieberLieber Software

Customer Base

FINANCE

CitiGroup
Wells Fargo
Bank of America
JPMorgan Chase
National Australia Bank
Royal Bank of Canada
Royal Bank of Scotland
Reserve Bank of NZ

INSURANCE

Skandia,
PMI,
Zurich,
First
American,
Fidelity National

TELECOM

Vodafone
T-Mobile
China Mobile
Motorola,
Orange
AT&T
Verizon
NTT DoCoMo

AUTOMOTIVE

Toyota
Mitsubishi
BMW
TRW
General Motors
Chrysler
Daimler Mercedes
Volkswagen

Aer'spce & Def

BAE Systems
Smith's Aerospace
Lockheed Martin
BOEING
General Dynamics
EADS
Northrup Grumman
Thales
Rolls Royce
Bombardier

UTILITIES

Duke Energy
Scottish Power
Origin Energy
Sierra Pacific
Edison International
Southern California Edison
Exelon Corp
ComEd
Pico Energy

ELECTRONICS

Nintendo
LG Electronics
Konica Minolta
Sony
Panasonic
Sharp
Olympus
Nikon

MEDIA

Walt Disney
Time Warner
Comcast
Tribune
SES Global

TECHNOLOGY

Hewlett Packard
Honeywell,
Microsoft
Canon,
IBM
Toshiba
ORACLE
SAP

BIOTECH

Pfizer
Novartis
Sanofi-aventis
Roche Holdings
Abbott Laboratories
AstraZeneca
GlaxoSmithKline
Merck & Co

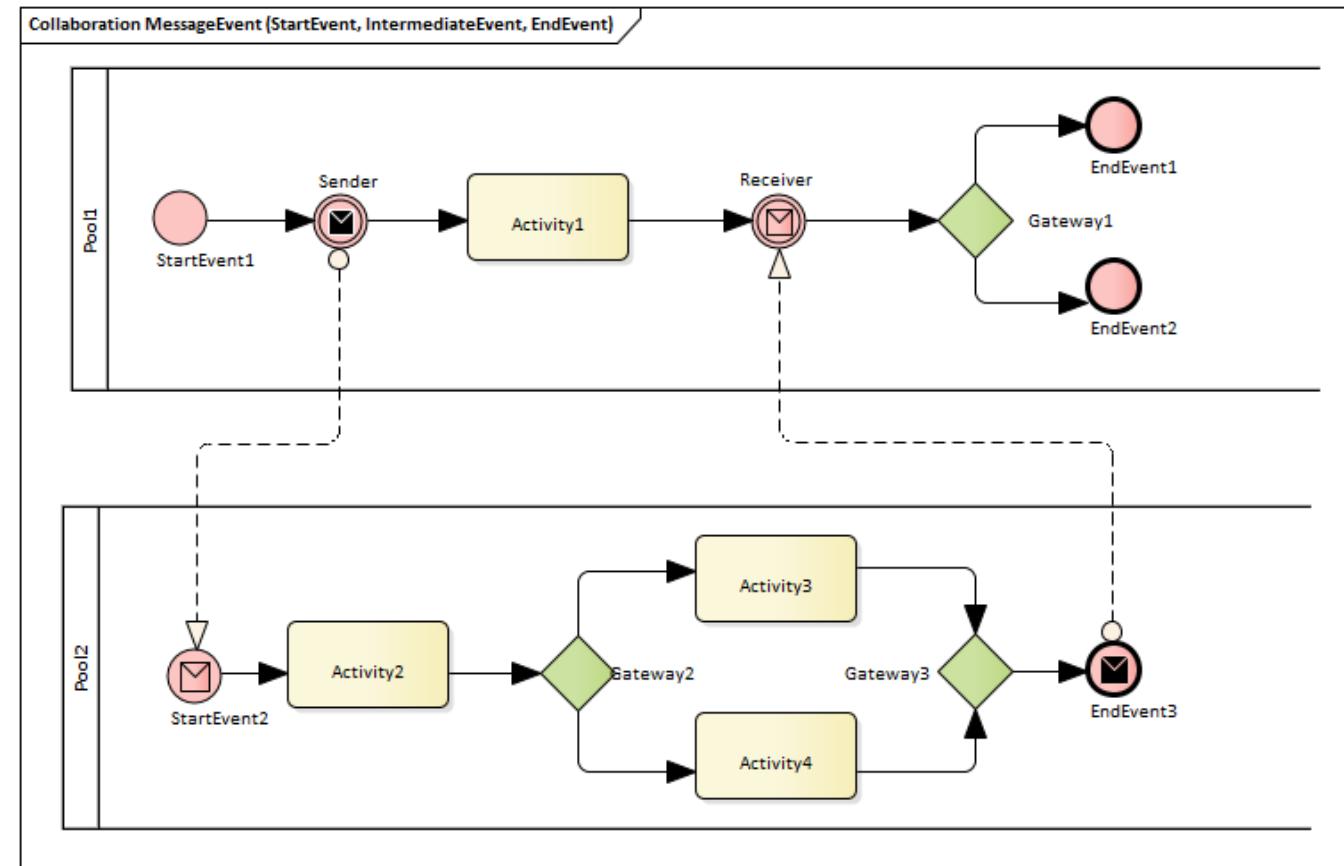
RETAIL

Wal-Mart
Kroger
Target
Walgreen
The Home Depot
Costco
CVS Caremark

GOVERNMENT

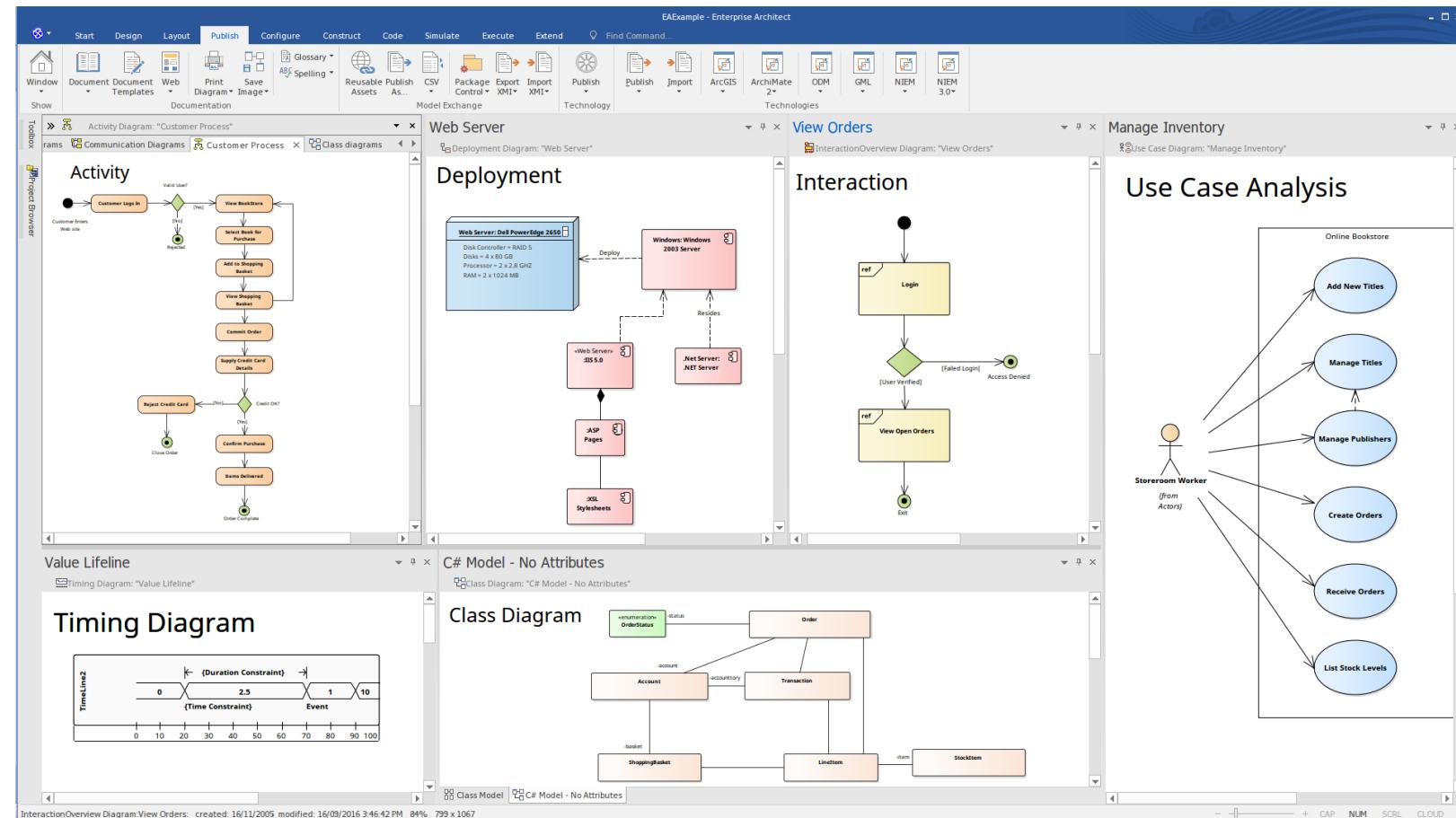
Canada
United States,
Australia
Europe
India
United Kingdom
Colombia
Sweden

Modelling what the f...? E.g. BPMN



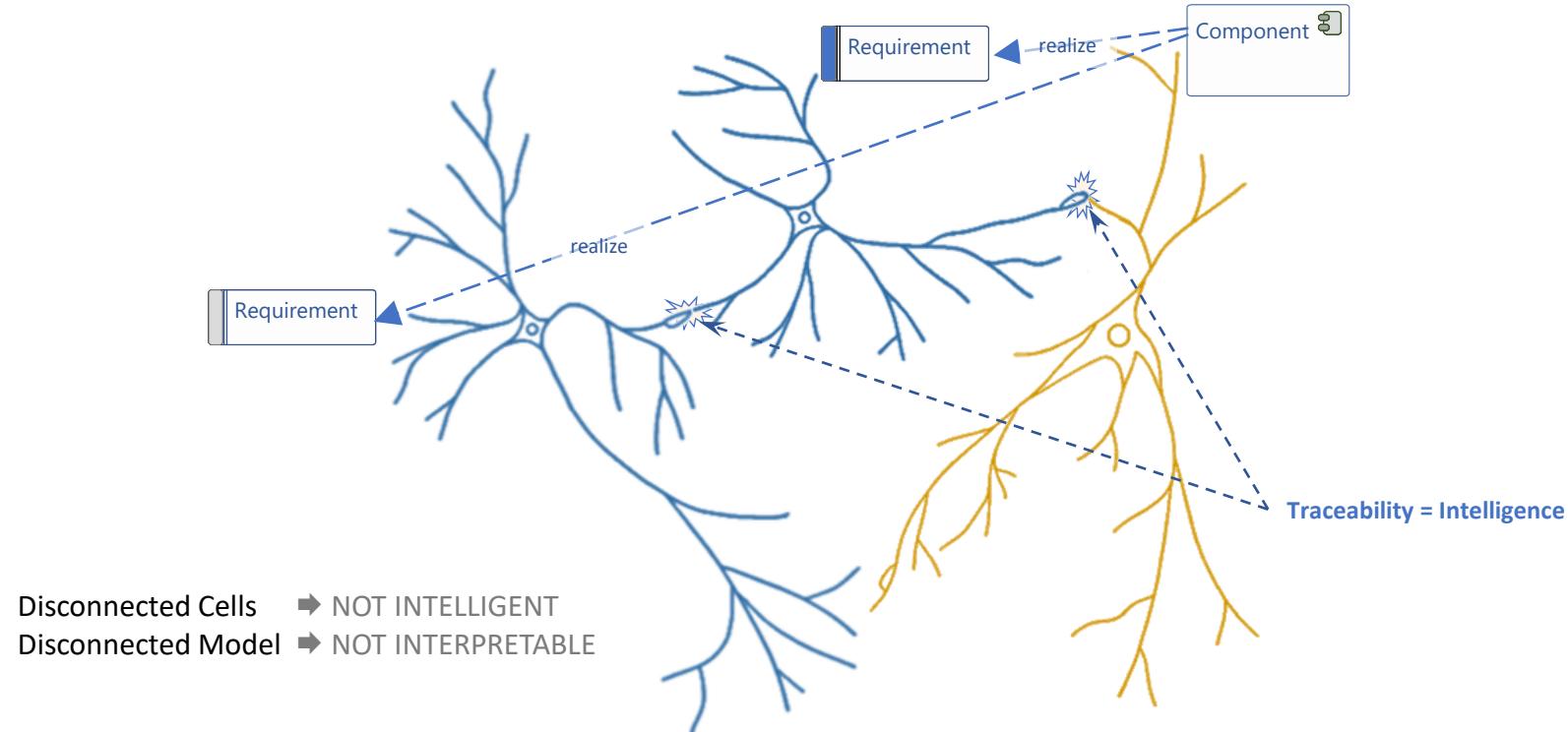
**ENTERPRISE
ARCHITECT**

UML 2.5



**ENTERPRISE
ARCHITECT**

Traceability is the key for model intelligence



Who needs modelling?

Information Management

Allianz AXA Swisscom
VIG Commerzbank

**Companies dealing with data
(e.g. EU GDPR)**

- Finance
- Banking
- Insurance
- Retail
- ...

Cyber Physical Systems

VW Daimler Siemens
Airbus BMW ...

**Embedded Systems, Safety
Critical Systems, ...**

- Automotive
- Health
- Aerospace
- Space
- Defense
- Transportation

Application Development

SAP Software AG ...

**Companies developing
(complex) Software or Systems**

- Web
- Mobile
- Desktop
- Cloud
- ...

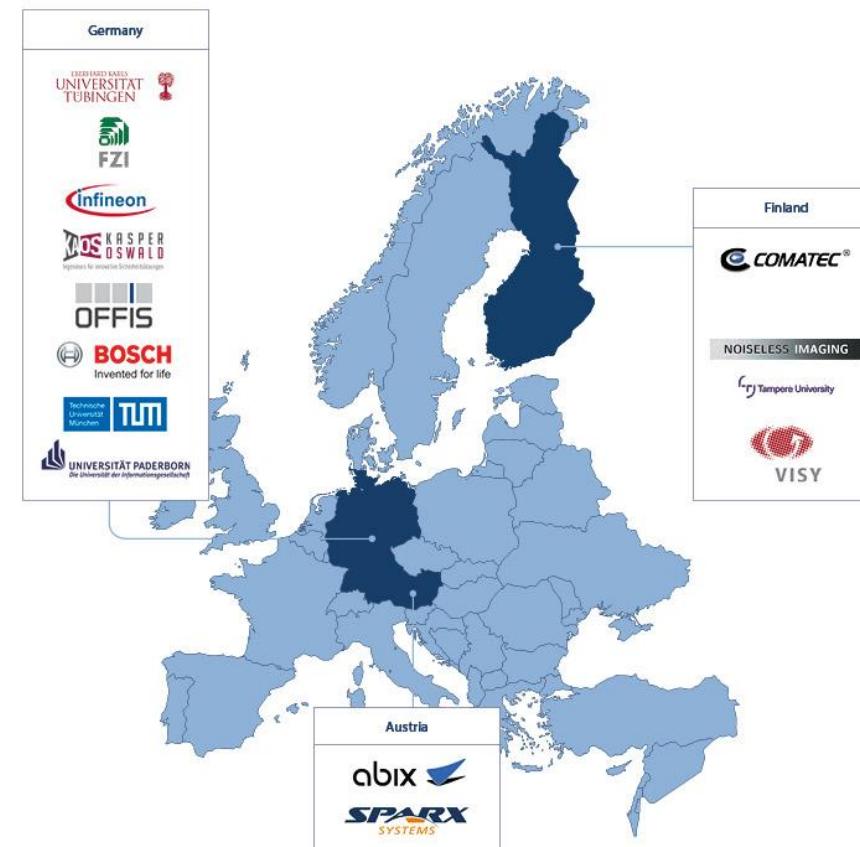


**ENTERPRISE
ARCHITECT**



EUREKA ITEA3 COMPACT

- Cost-Efficient Smart System Software Synthesis

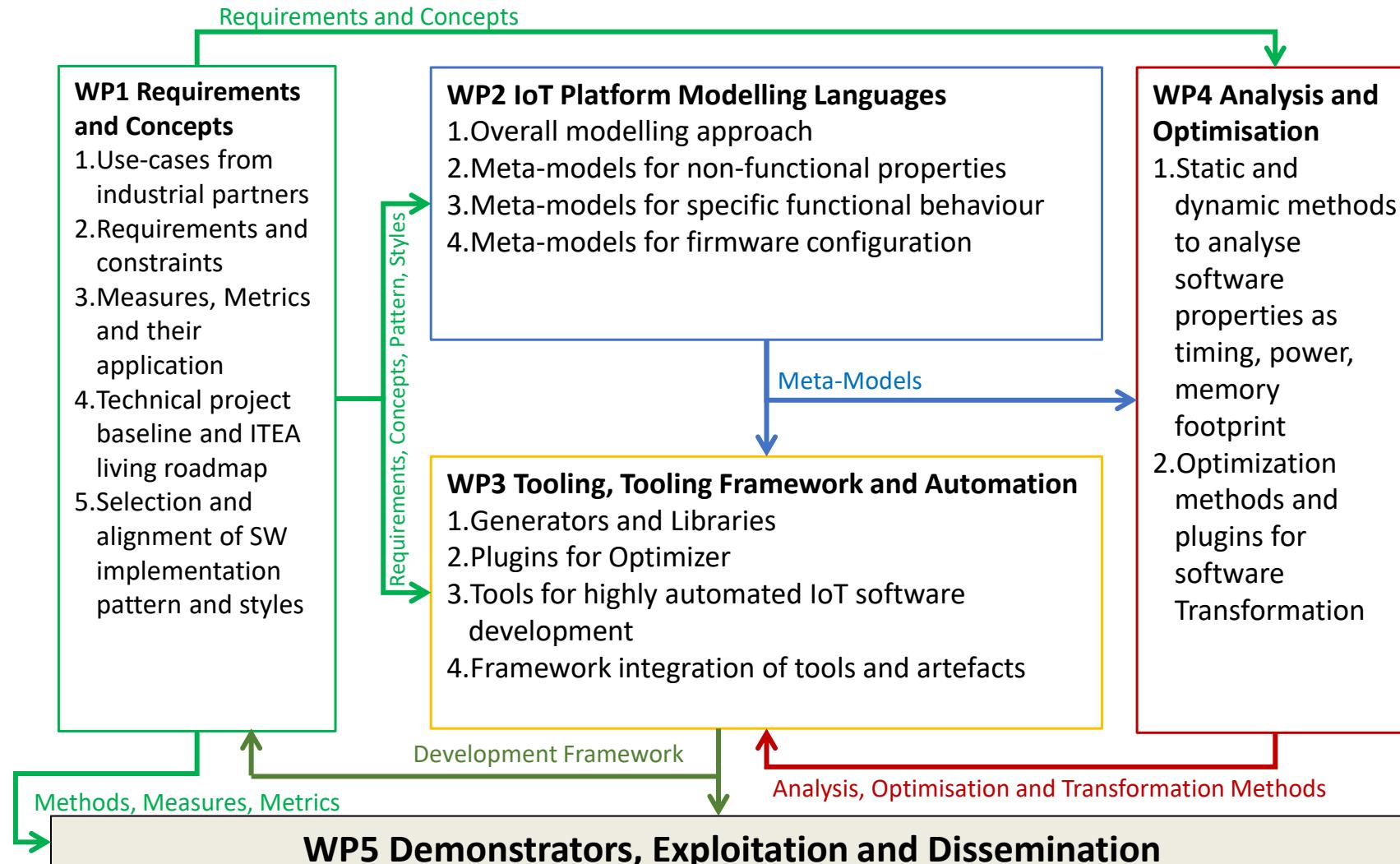


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FINLAND**

WP6 Project Management



Cost Pressure Grows and affects both:
Manufacturing and Design Cost



Walmart Calls for Sub-\$1 IoT Sensor

[Rick Merritt](#)

12/4/2017

https://www.eetimes.com/document.asp?doc_id=1332669&print=yes

IoT May Need Sub-50-Cent System-on-Chips (SoCs)

[Rick Merritt](#): ARM TechCON Panel previews rough road to 2027 end nodes

10/27/2017

https://www.eetimes.com/document.asp?doc_id=1332517&print=yes



The “terrible” 3 cent Microcontroller Unit (MCU) – a short survey of sub \$0.10 microcontrollers.

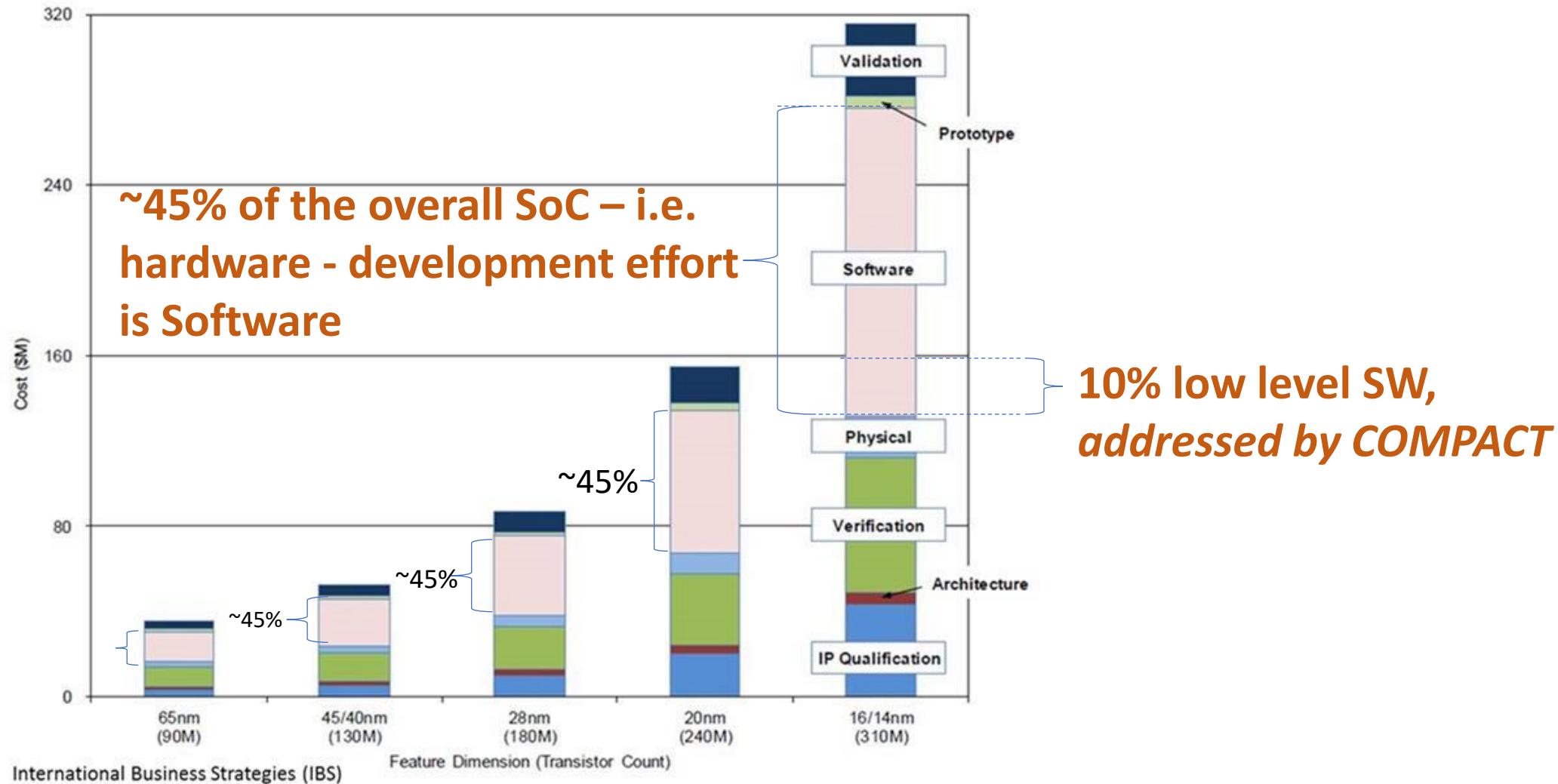
Tim's Bloc:

12/08/2019

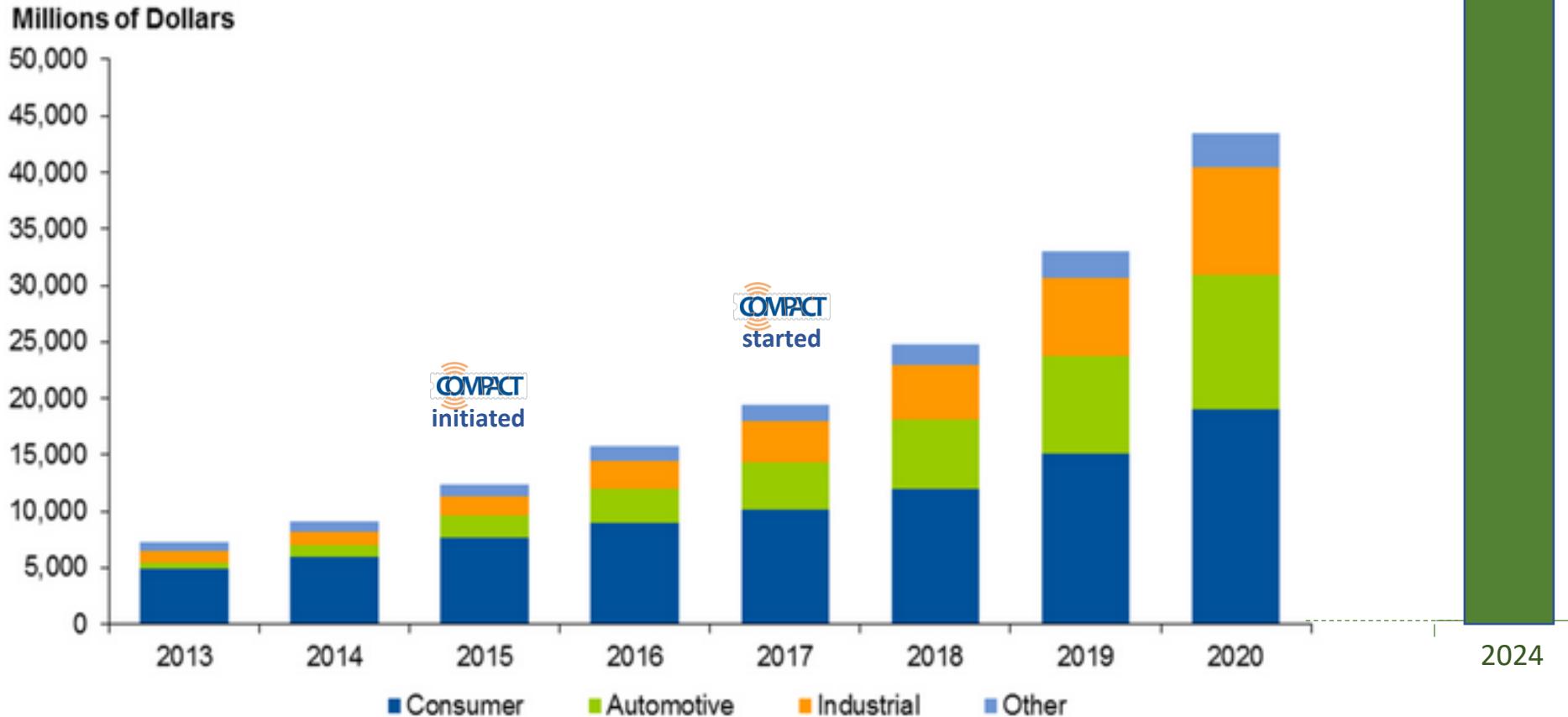
<https://cpldcpu.wordpress.com/2019/08/12/the-terrible-3-cent-mcu/>



SW Design dominates SoC Design Cost Compact addresses HW related SW



Gartner: Potential of the IoT for Semiconductors continues to grow



Gartner Says the Processing, Sensing and Communications Semiconductor Device Portion of the IoT Is Set for Rapid Growth.

<https://www.gartner.com/newsroom/id/2895917>, 2014

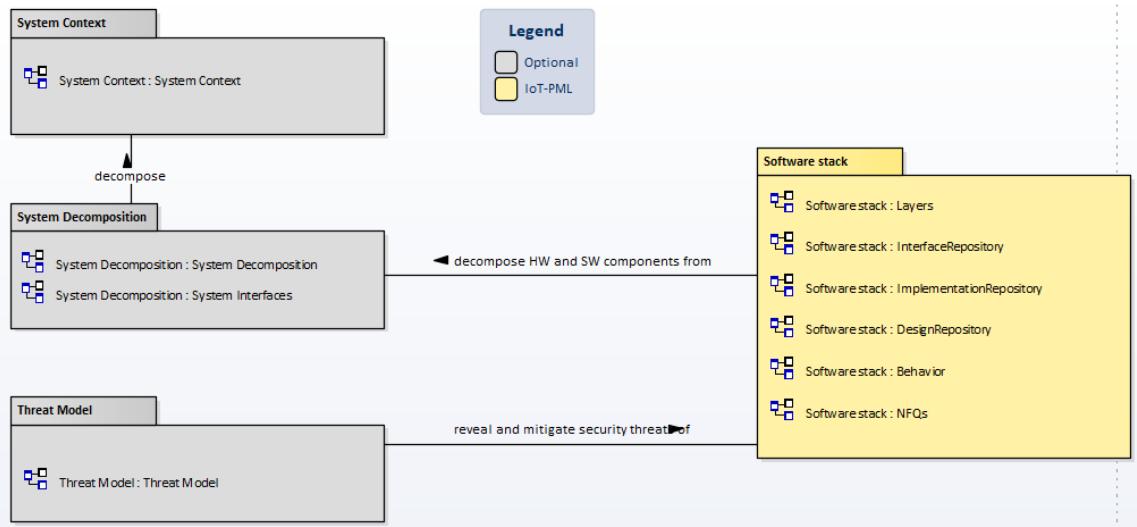
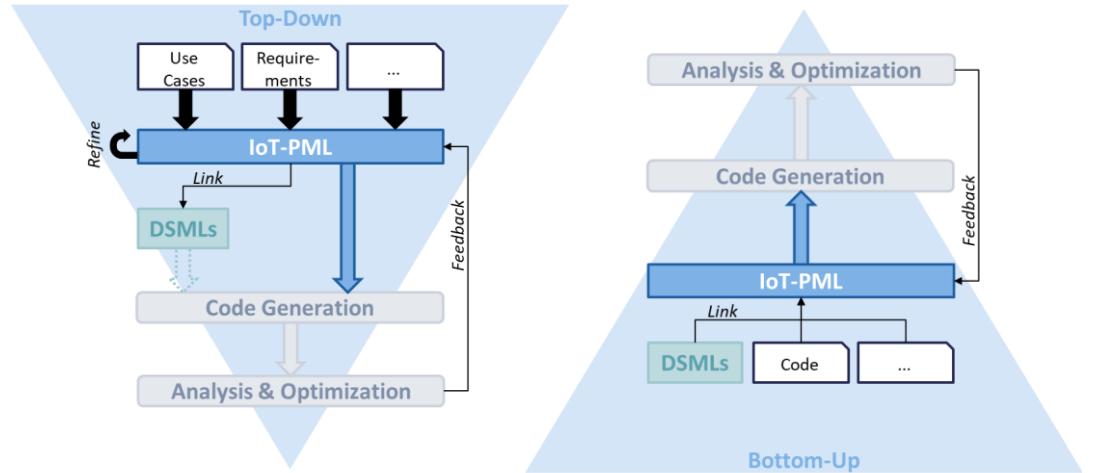
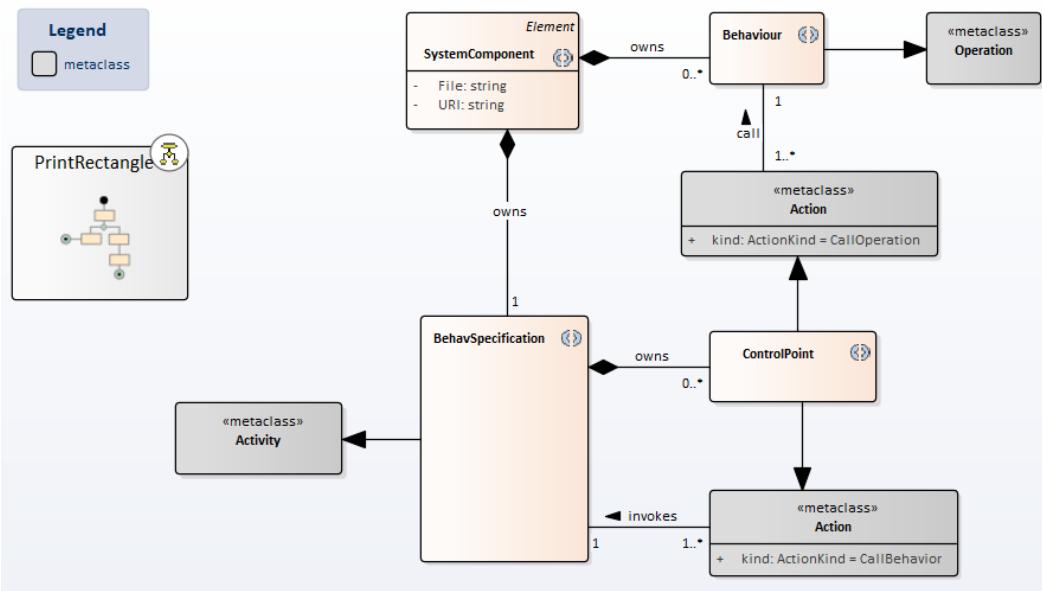
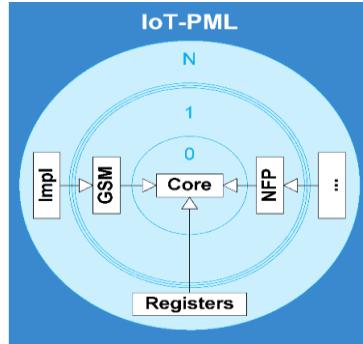
Gartner Says the IoT semiconductor consumption will increase to \$61,2 in 2024

[Forecast: IoT Semiconductors, Worldwide, 2Q20 Update \(gartner.com\)](https://www.gartner.com/research-report/forecast-iot-semiconductors-worldwide-2q20-update), 2020



Achievements Overview

IoT-PML



Modeling of design alternatives

- First embedded implementation on the PYNQ-Board.
- Second implementation for KL25Z4 Board.

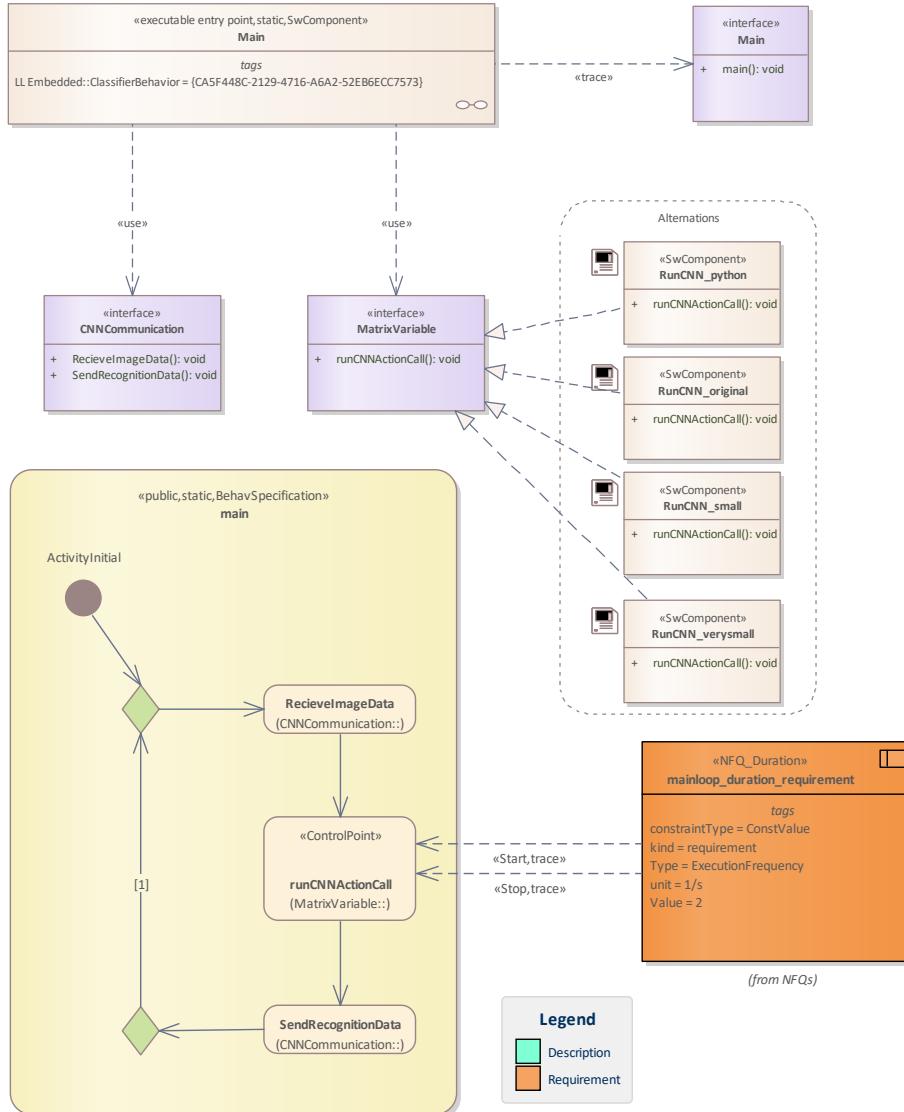


PYNQ-Board



KL25Z-Board

One model to rule them all ☺



IoT-PML



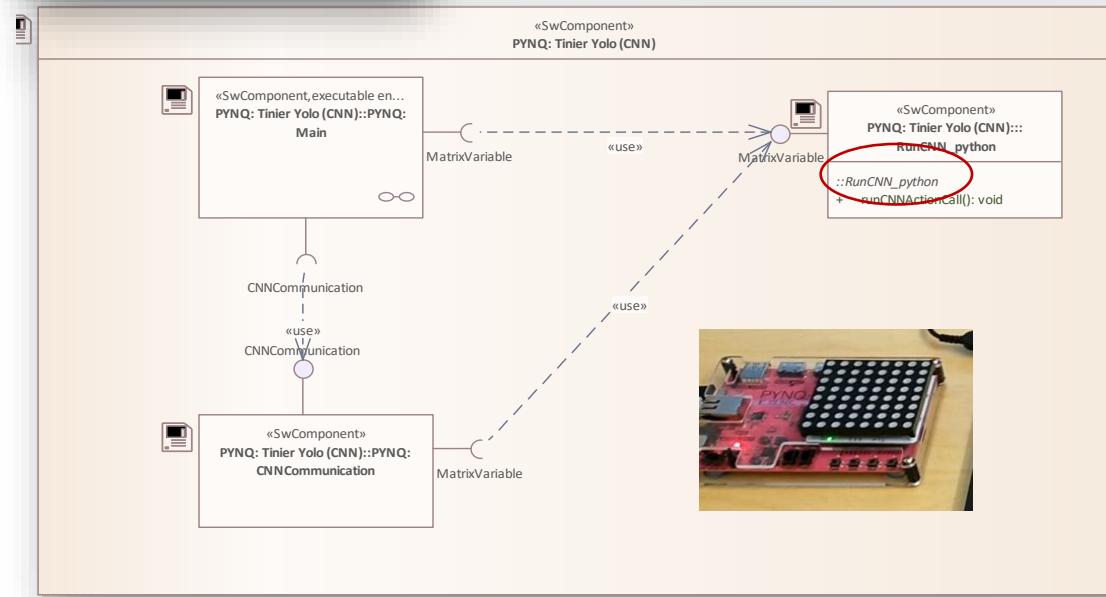
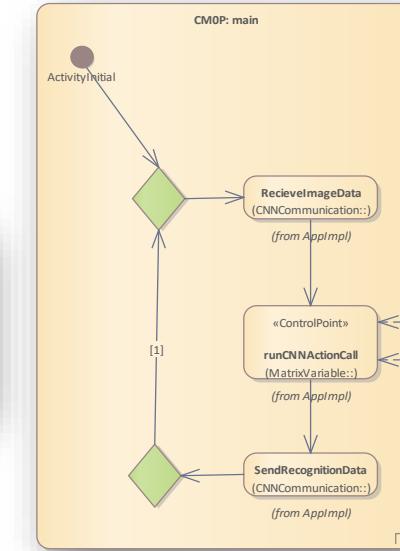
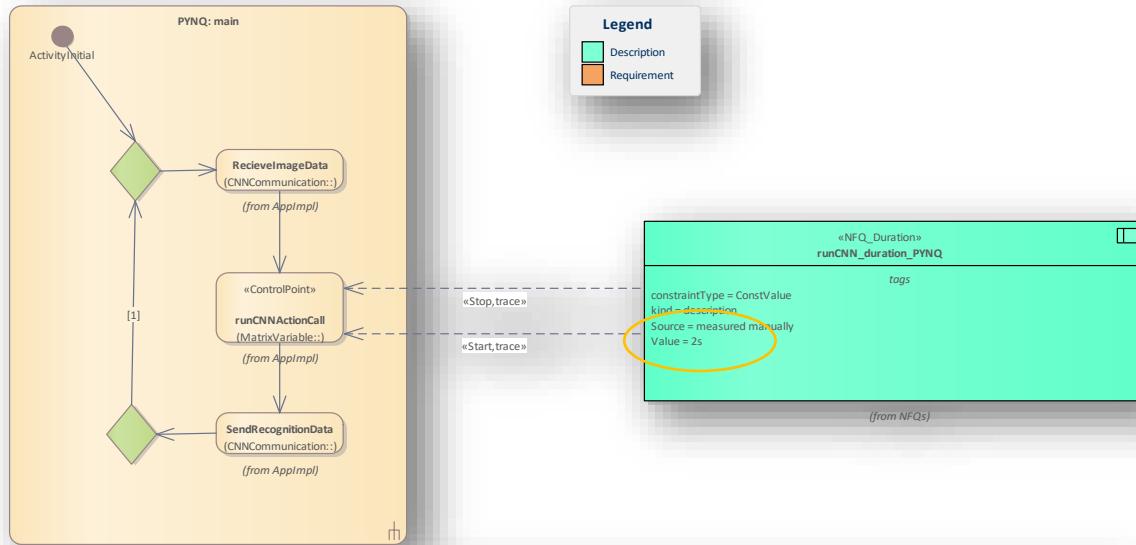
PYNQ-Board



KL25Z-Board

Design alternatives

Change of Platform, Types without touching source code





Generator and generated Code Size almost the same

The template size is

- in worst case 58% bigger but
- in best case 28% smaller and
- in average, the template code is about 26%

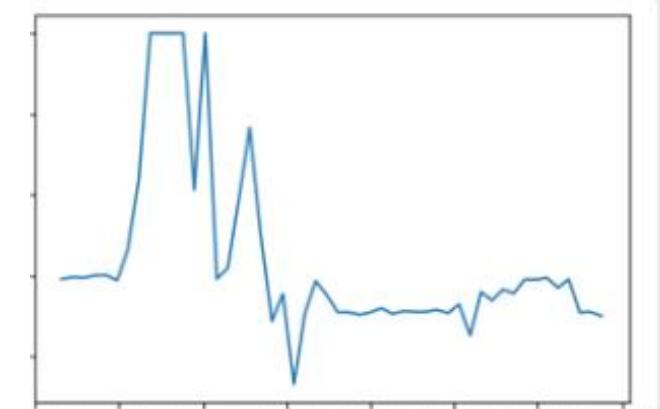
IO-Device	Firmware LoC			Template (LoC)
	interrupt	asynchronous	synchronous	
UART	232	236	226	356
SPI	360	364	348	481
DMX	192	196	187	267
PAD	430	430	422	309
I2S	312	321	303	402

The generator has about the size of the generated code.

It pays off from the second use

Some cool Use Cases

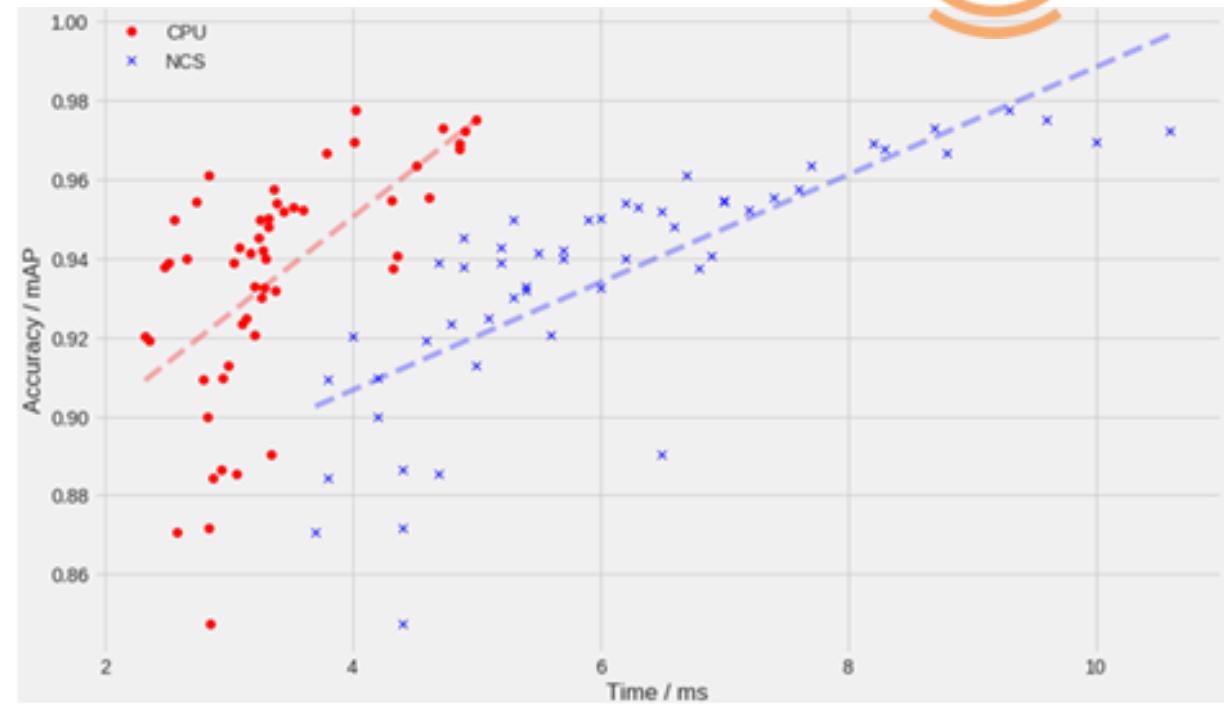
- ToolChain
 - Neural Network Machine Learning
 - COMPACT has enabled new applications not possible earlier.
 - Deployment well in schedule
 - Successful cross-platform testing
 - Demo platform and even real test installations outdoors



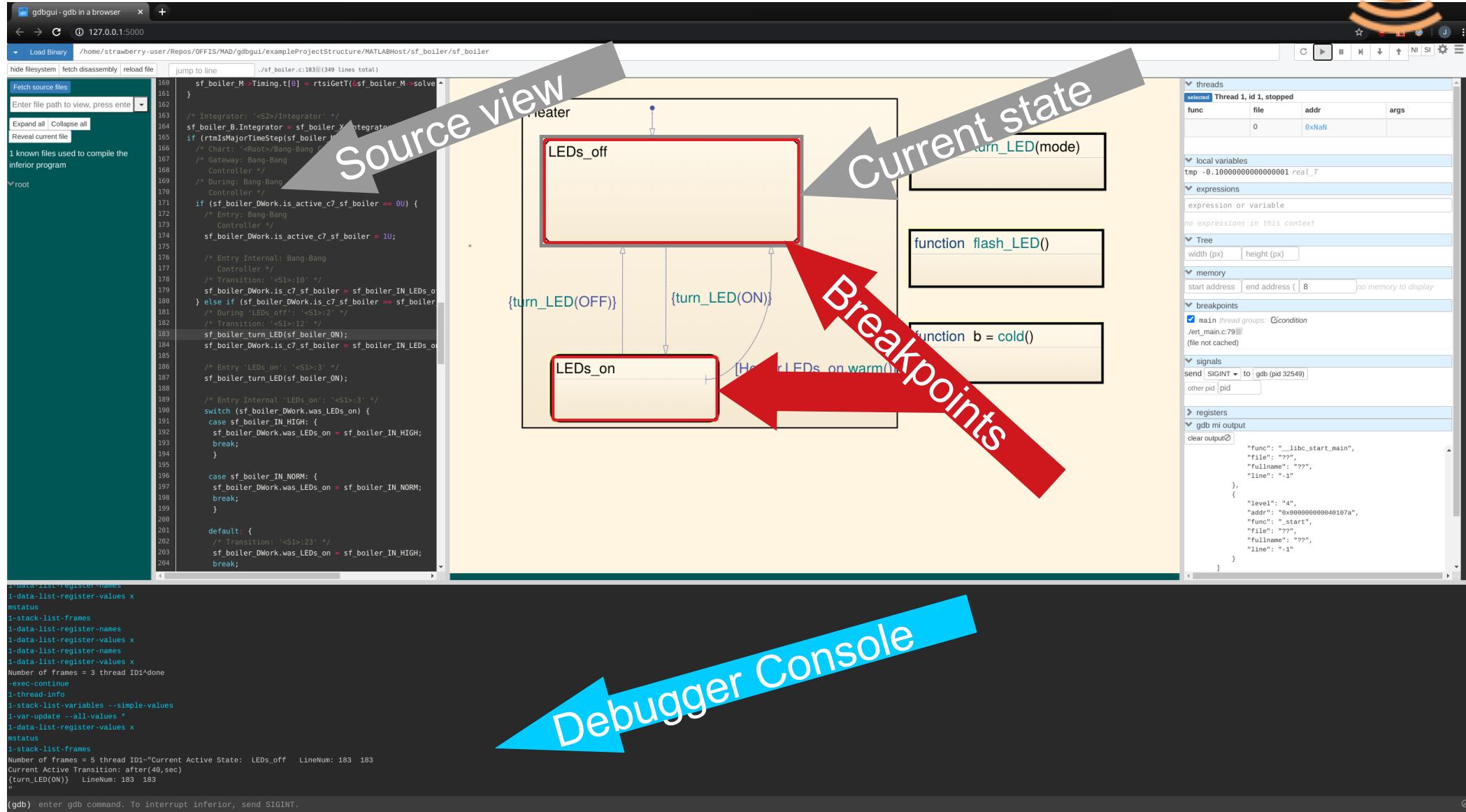
Car Detector

Optimized deep neural net object detectors

- Cross-platform deep neural network support
- *Inference speed optimized from original 300ms to 18ms only*
- Study of network size effect on network performance and accuracy
- Car detector demo platform running on ARM, joint effort by Visy and Tampere University



Some cool outcomes (model debugger)



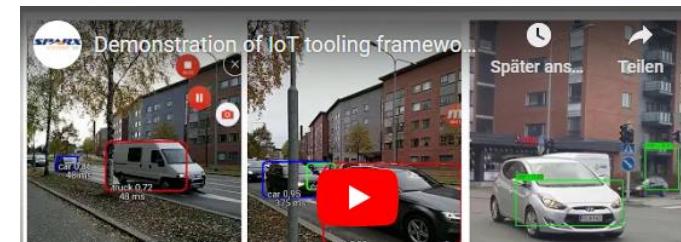


Cyber Security Modelling for IoT

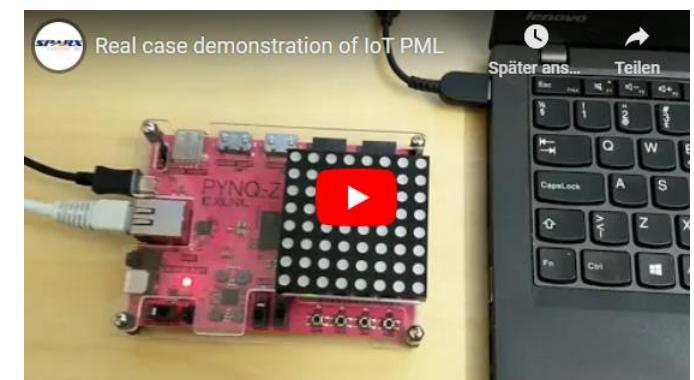
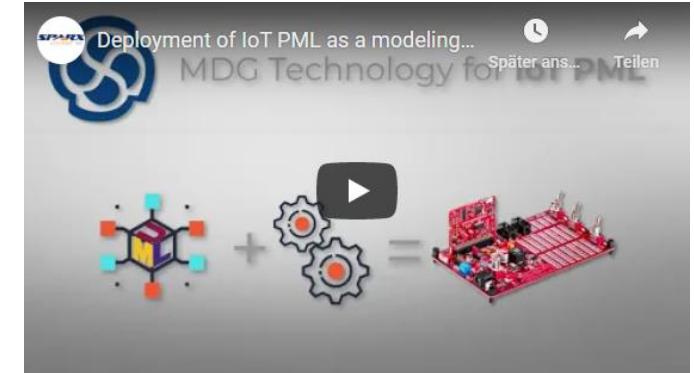
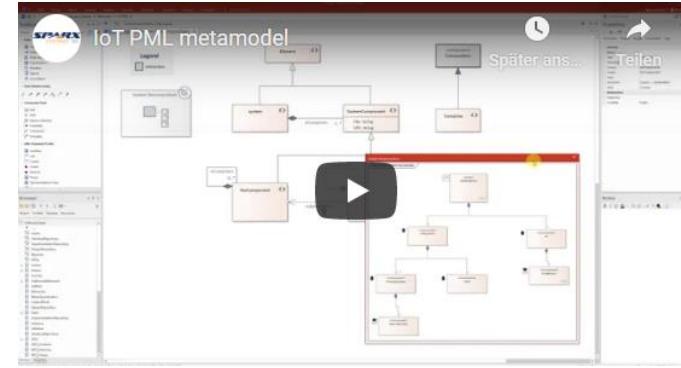


Public Available Videos

All videos are available at
<https://www.sparxsystems.eu/iot/>



In this demonstrator the following aspects are covered...



SparxSystems Central Europe - Resume

- Hard **finding phase** in the beginning as consortium is huge, but share your knowledge open, **share** your assets with all participants then you get things back (*first give – then take*)
- New **customers** (not always with results of this research projects, but because of the **network**): Infineon, NASA/JPL, Volkswagen Group, ...
- New marketing opportunities:
 - Choosen Austrian Role Model of ITEA3:
 - <https://itea3.org/magazine/35/march-2020/sparxsystems-central-europe.html>
 - <https://itea3.org/news/cost-efficient-smart-system-software-synthesis.html>
 - (published May, 11th 2021)
- New product ideas, stories or partnerships:
 - www.sparxsystems.eu/iot
 - www.threatget.com
- New **opportunities** (not too late to join)
 - <https://itea3.org/project/v-space.html>



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