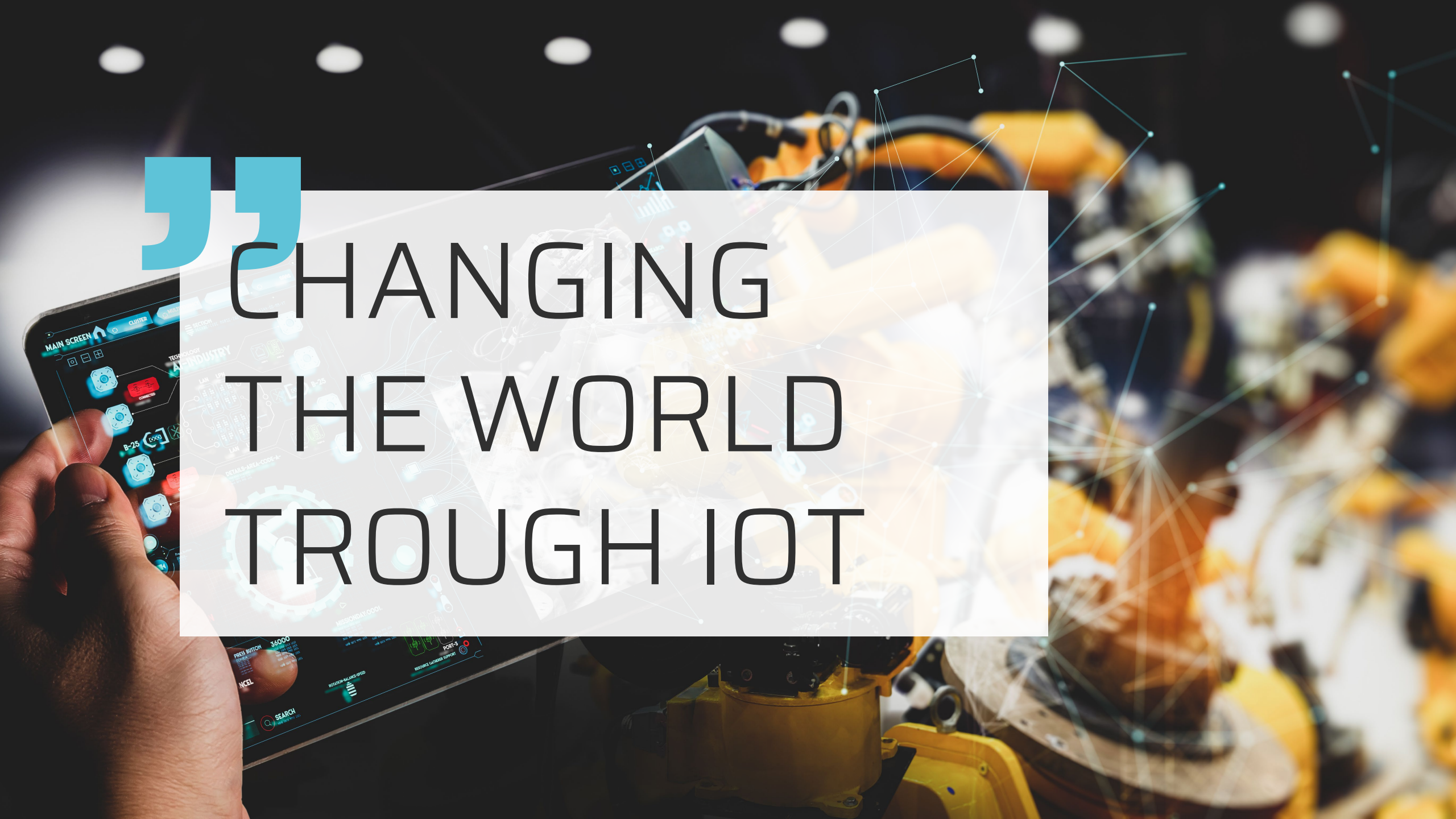


HOW EDGE COMPUTING ENABLES PREDICTIVE MAINTENANCE OF VALVES

ZAM MEETS AI

”

CHANGING
THE WORLD
THROUGH IOT



IOT-HOTSPOT SILICON SAXONY

THE HUB AS A MELTING POT OF IOT SITE POWER

IOT SITE POWER

~600

HARDWARE COMPANIES

~ 1.700

SOFTWARE & IT-COMPANIES

>30

DEEP-TECH-START-UPS PER YEAR

20

RESEARCH & DEVELOPMENT
INSTITUTES

HUB STRUCTURE



IOT STARTUPS



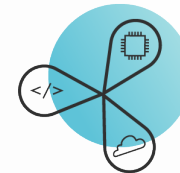
IOT SMEs

+450

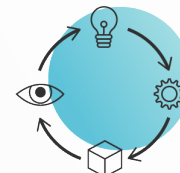
HUB EXPERTISE



ACCESS



COMPETENCE

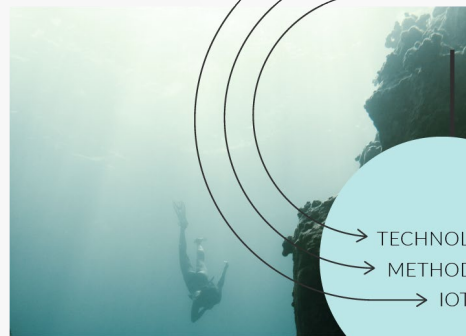


SPEED

LEARN - SEE - DO

OUR SERVICES FOR THE DIGITAL CHANGE

LEARN ACADEMY



| MEETUPS
| TECH AND TALENT TEA TALKS

SEE DEMOZONE



186
successful
cooperations

75
IoT reference
solutions

102
matchmaking of
professionals &
corporates

| TRAILS
| RIDE2CAREER

DO FACTORY



| THINGKLIGHT
| THIN[GK]ATHON®
| DIGITAL PRODUCT FACTORY

REFERENCE PROJECT

PREDICTIVE MAINTENANCE OF CRITICAL INFRASTRUCTURE

How can edge computing and sensor-based monitoring of valves ensure uninterrupted production

CHALLENGE GF

Solution approach for monitoring production-critical ultra-pure water valves with the aim of detecting possible failures at an early stage and better planning maintenance processes.

PARTNERS



TEAM

Product managers, industry experts, sensor and equipment cloud experts, edge AI experts, embedded programmers, software developers, UI/UX-Developers, engineers and project coaches





ROLE

Embedded
Programming

Edge AI



ROLE

Challenge
Owner

Industry &
Use Case
Expert



ROLE

Sensor

Equipment
engineering



ROLE

Multi-sensor
platform

Sensor
integration



ROLE

Product
Owner

Method
expert

Developer



ROLE

Cloud-
integration &
Services

Dashboard



AN INDIVIDUAL TEAM OF CROSS-INDUSTRY EXPERTS

INDUSTRY EXPERTISE & BUSINESS DEVELOPMENT



CHALLENGE &
INDUSTRY MATTER
EXPERTISE

AXEL PREUSSE



CHALLENGE
OWNER & USE
CASE EXPERT

ALEXANDER KIRSTAN



USE CASE EXPERT

MICHAEL WOTZKA



SCRUM MASTER /
BUSINESS
DEVELOPMENT

HANS KLINGSTEDT



CUSTOMER &
INNOVATION EXPERT

MARCUS DANKLEMAN

SENSOR, SENSORPLATTFORM & EQUIPMENT ENGINEERING



MULTI SENSOR
PLATTFORM

MARIO GRAFE



SENSOR
INTEGRATION

FLORIAN NEBE



SENSOR & EQUIPMENT
ENGINEERING

DIRK MOTHES



HARDWARE
DEVELOPER

SAMUEL BOTZLER

PRODUCT FOKUS & METHODOLOGY



METHODOLOGY
EXPERT & PRODUCT
OWNER

DR. ANDRÉ GRÄNING



HUMAN
RESSOURCES

NADJA DEHNE

SOFTWARE & EDGE AI



EDGE AI & EMBEDDED
PROGRAMMING

RENÉ GASTMEIER



EDGE AI & EMBEDDED
PROGRAMMING

RAMON STEPPAT



SW-DEVELOPER &
AI MODEL

ANIL KUMAR
MYSORE
BADARINARAYANA

CLOUD & DASHBOARD



INNOVATION
EXPERT

CHRISTOPH KÖGLER



SOFTWARE & CLOUD
INFRASTRUCTURE

RICO SCHMIDT



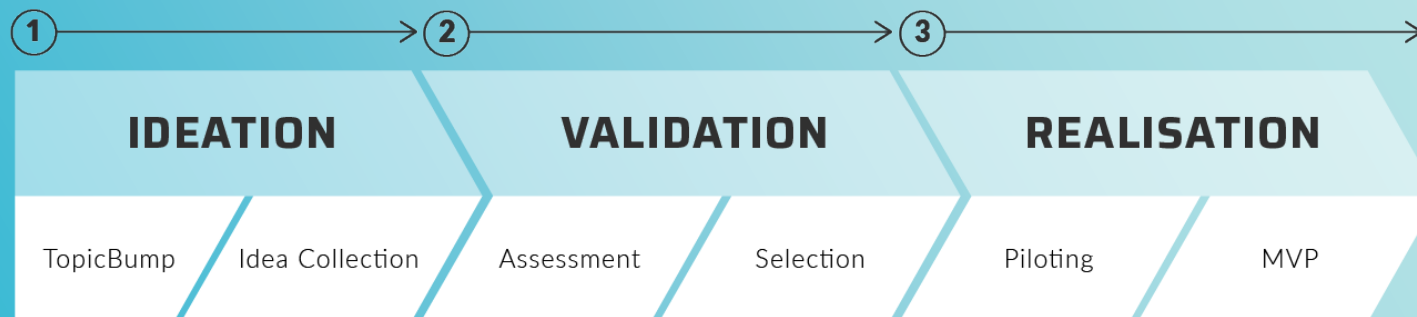
UI-DESIGNER

JINGYAN XIEDU

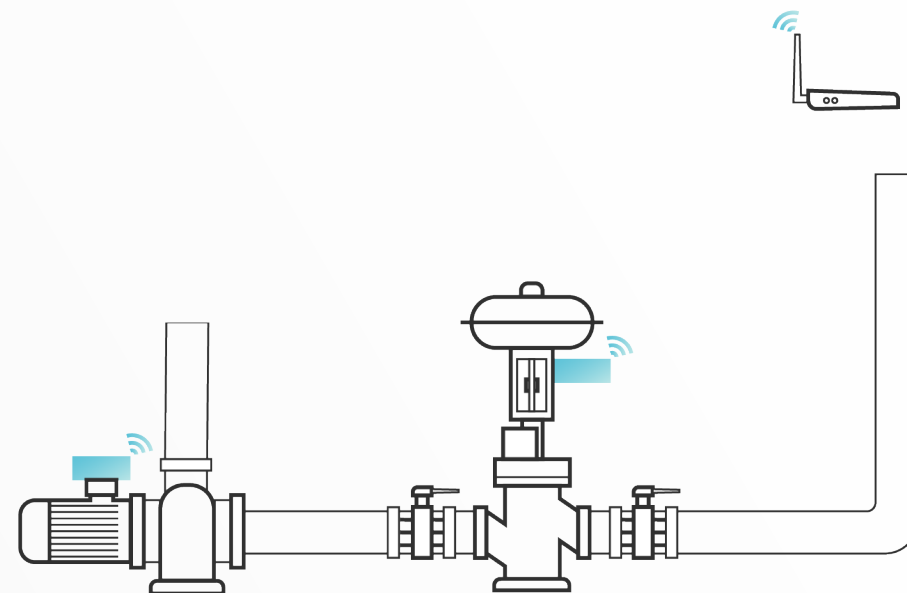


DIGITAL PRODUCT FACTORY

ACCELERATED GO-TO-MARKET

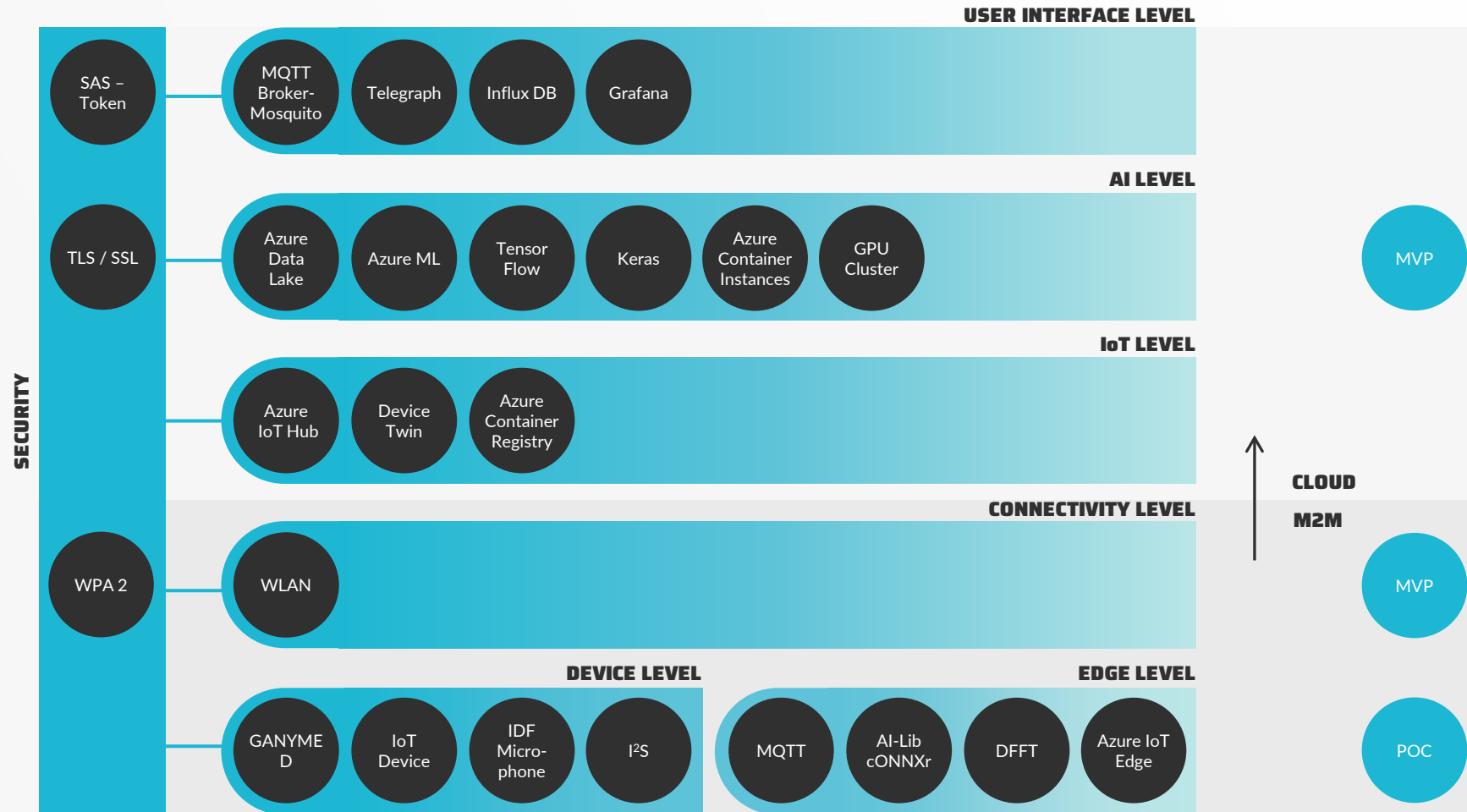


PREDICTIVE MAINTENANCE OF VALVES

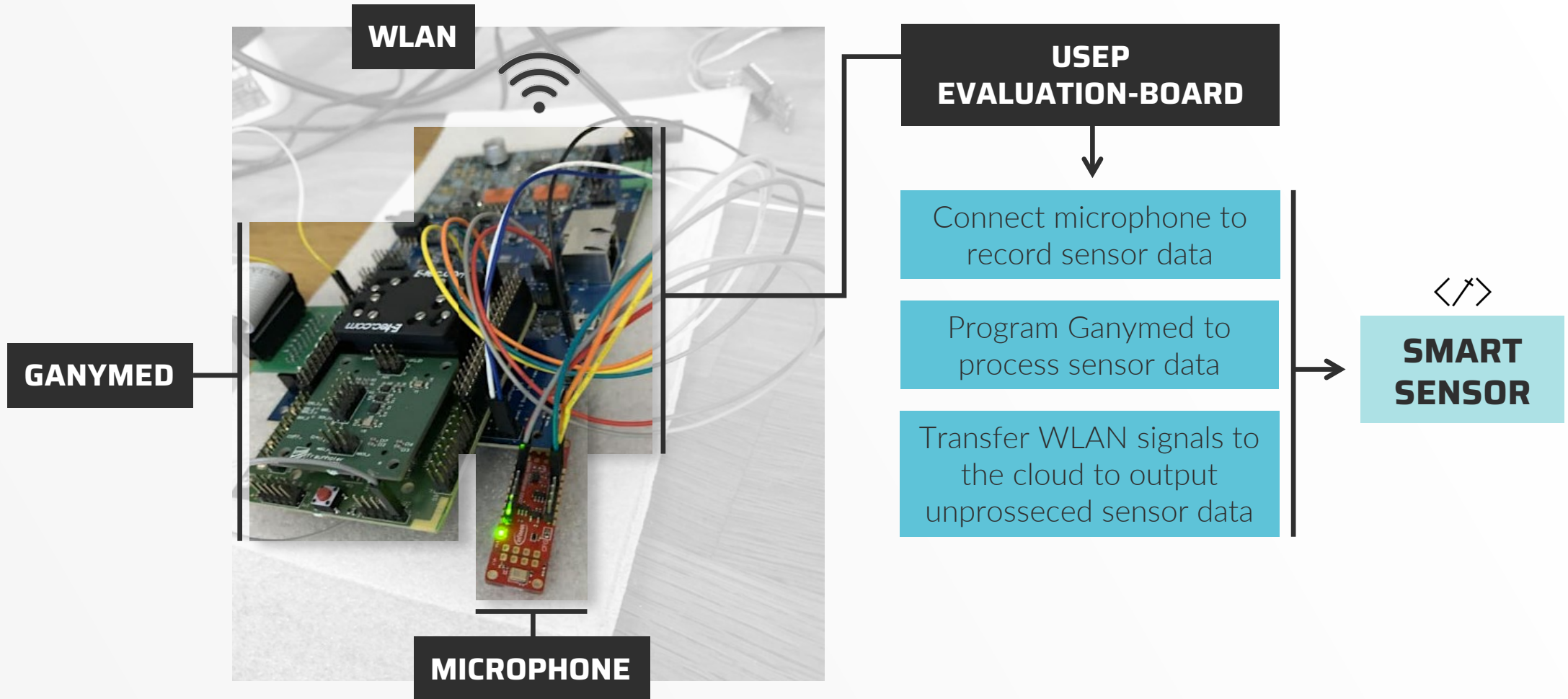


The result is an innovative IoT solution. Application-independent, the solution prevents downtimes in production through AI based early fault detection.

TARGETED LEVEL @ THE INTERNET OF THINGS STACK



HARDWARE DEVELOPMENT



GANYMED® - SENSRY'S EDGE AI SENSOR PLATFORM

EDGE AI SENSOR PLATFORM



FEATURES

- Multicore: 9 RISC-V cluster cores
- 4MB RAM & 1MB MRAM
- Rich digital & analog interfaces
- CAN-FD Core
- Ethernet-TSN Core
- High Security: TRNG, OTP, AES, Secure Boot...
- Variety of supported Sensors
- **Customizable Package-on-Package Peripherals**
- Software SDK & Examples

Ganymed is result of the public funded development project „Universal Sensor Platform“

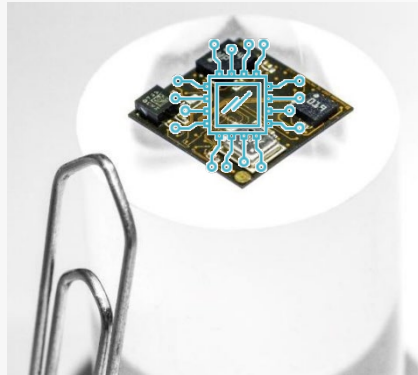
Project partners: Fraunhofer IIS, IZM, IPMS, ENAS & GLOBALFOUNDRIES



EMBEDDING AI IN SMART SENSORS

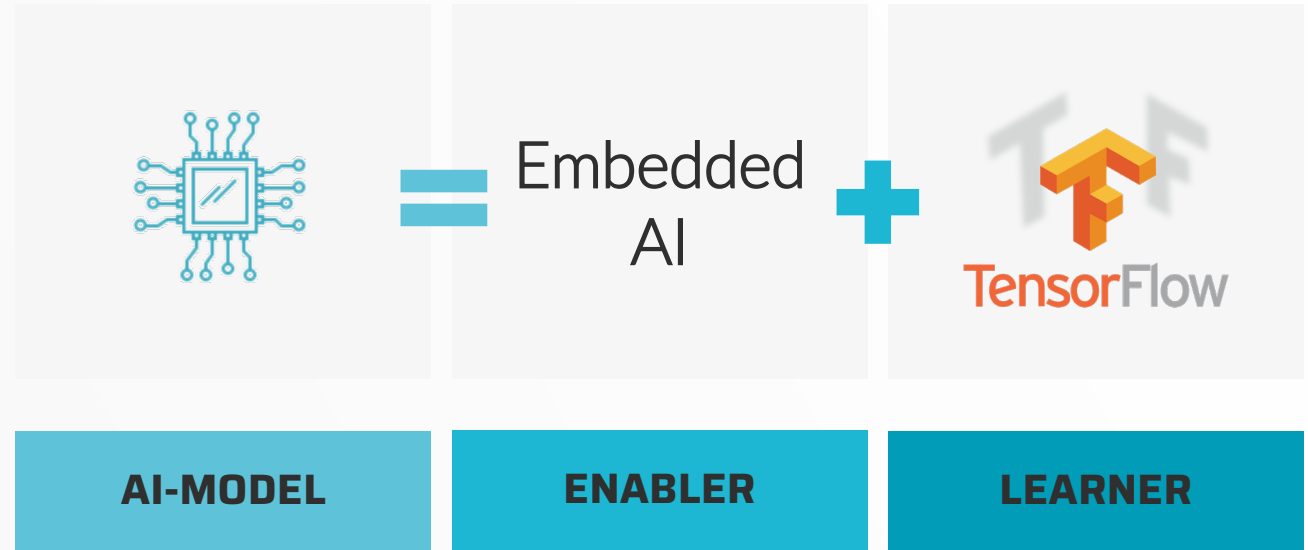
AI as a prerequisite for Predictive Maintenance

THE GOAL



AI SENSOR

THE SOLUTION



EDGE AI - BENEFITS AND ADVANTAGES

Increase performance by reducing latency

SPEED

Large number of data points can be measured

HIGH PRECISION

Evaluation even without the internet

INDEPENDENTLY

No data transfer between shopfloors, countries etc. needed

SECURITY & COMPLIANCE

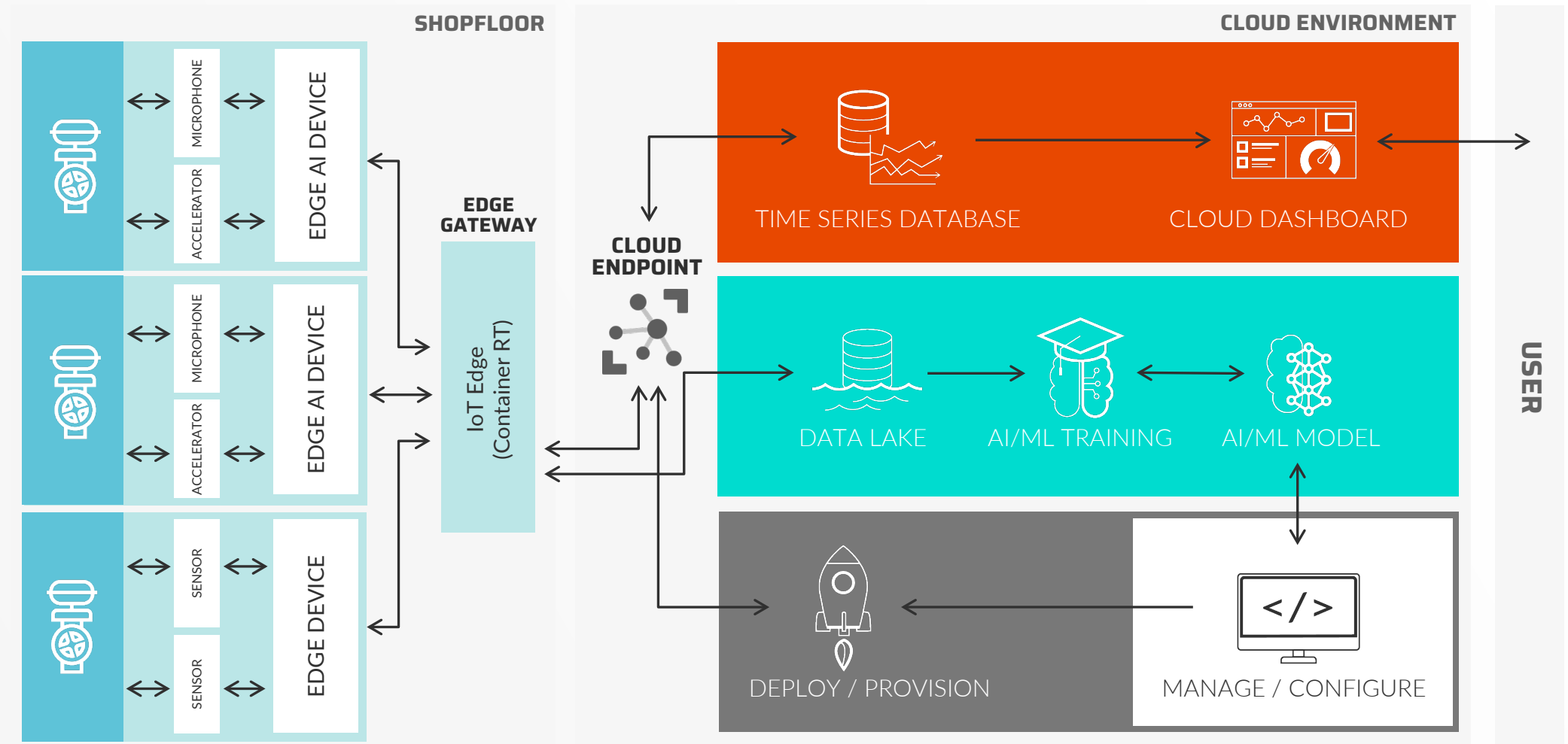
Companies can expand their computing capacity through a combination of IoT devices and edge data centers

SCALABILITY

↓
COST REDUCTION



CLOUD SHOPFLOOR INTELLIGENCE DATA TRANSMISSION



CLOUD SHOPFLOOR INTELLIGENCE DASHBOARD



SUMMARY

PREDICTIVE MAINTENANCE OF VALVES

RESULT

Thanks to the scalable edge computing solution, incipient defects are now detected at an early stage. Maintenance measures can be planned effectively. Monitoring of the valves is possible in real time even if the WLAN connection is briefly interrupted and is visualized by means of a clear dashboard.

ADVANTAGES



Maintenance processes can be planned in a demand-oriented and cost-efficient manner



data-based condition monitoring is possible in real time



Fail-safe operation of the production facilities

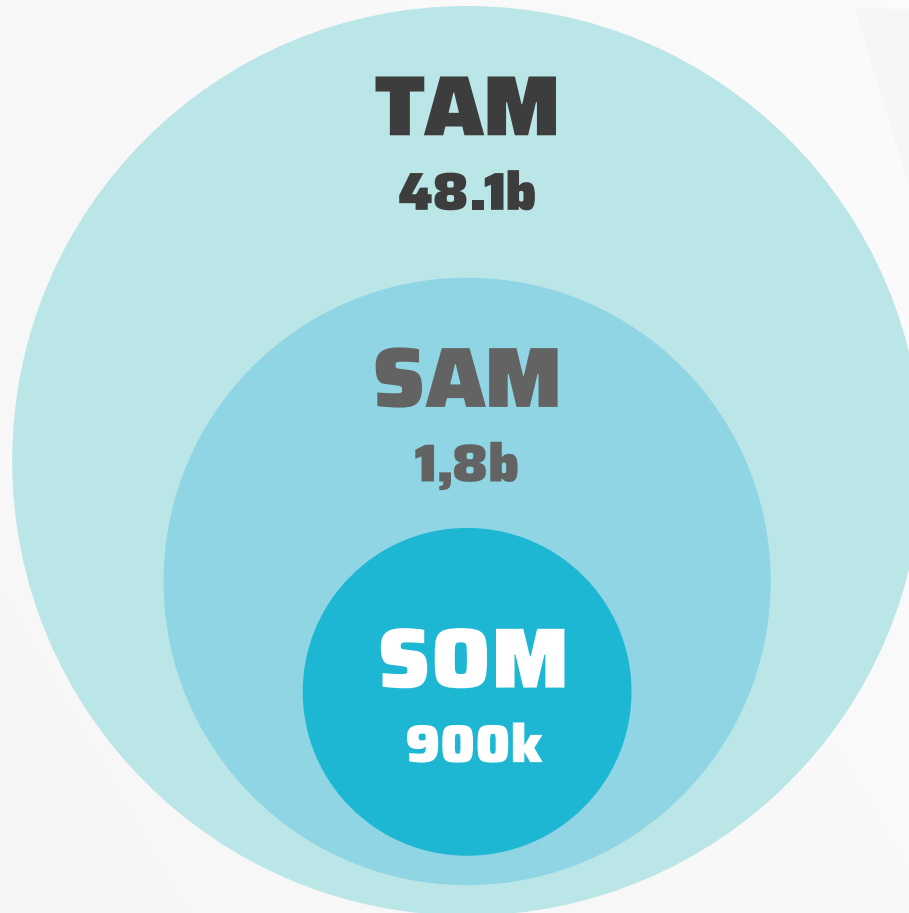


Time & personnel expenditure in the maintenance process is reduced



SUMMARY

MARKET OPPORTUNITIES



TOTAL ADRESSABLE MARKET (TAM)

Industrial Valves Market was valued at USD 48.1 billion in 2020 and is projected to reach **USD 85.7 billion by 2025 *****

CAGR of 12.3%

SEGMENTED ADRESSABLE MARKET (SAM)

The global valve controller market size is estimated at USD 1.8 billion in 2020 and is projected to **reach USD 2.2 billion by 2025****

CAGR: 3.7%

SEGMENTED OPERATABLE MARKET (SOM)

The global valve controller market size in the semiconductor industry is estimated at **USD 900.000 in 2020*****

- https://www.marketsandmarkets.com/Market-Reports/industrial-valve-market-256097136.html?gclid=Cj0KCQjwi7yCBhDJARIsAMWFScMEjY3Vnr6htAa2r8XMeNZNiv7EjUYjBywIhCh09EU_KYkpZyX1wUaAtrKEALw_wcB
- [**https://www.verifedmarketresearch.com/product/industrial-valves-market/#:-:text=Industrial%20Valves%20Market%3F-,Industrial%20Valves%20Market%20was%20valued%20at%20USD%2074.68%20billion%20in,3.58%25%20from%202020%20to%202027,](https://www.verifedmarketresearch.com/product/industrial-valves-market/#:-:text=Industrial%20Valves%20Market%3F-,Industrial%20Valves%20Market%20was%20valued%20at%20USD%2074.68%20billion%20in,3.58%25%20from%202020%20to%202027,)
- ***Interview with industry insider



PREDICTIVE MAINTENANCE OF CRITICAL INFRASTRUCTURE



”

Building a "real" if not yet perfect demonstrator has a much higher solution quality than any simulation, no matter how perfect. A complete system of hardware and software was created, which vividly solves the problem and forms the basis for future extensions."

DR. AXEL PREUSSE, GF FELLOW, GLOBALFOUNDRIES

LET'S SHAPE THE FUTURE TOGETHER



MICHAEL
KAISER

CEO

+49 (0)171 970 53 45
mk@smart-systems-hub.de



THANK YOU FOR YOUR ATTENTION!

