

# Challenges in Industrializing OSS

How Siemens Tackles Them

Jan Kiszka

Siemens Corporate Technology

# About Siemens

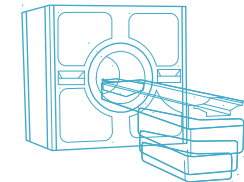
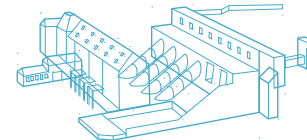
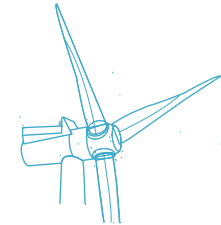
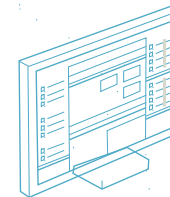


## In a nutshell

- 170 years long history of innovations
- Currently around 350'000 employees
- About 80 Billion Euro revenue (2016)

## Products and solutions for

- Power generation and distribution
- Industrial / building / rail automation
- Railway vehicles
- Medical technology
- Product life-cycle management software
- Security solutions
- ...





# Free & Open Source Software Widely Used in Our Products



## Power Generation



## Rail Automation



## Vehicle Control Systems



## Building Automation



## Industrial Automation



## CNC Controls



## Industrial communication



## Medical Imaging



# Free & Open Source Software Widely Used in Our Products

**SIEMENS**  
*Ingenuity for life*

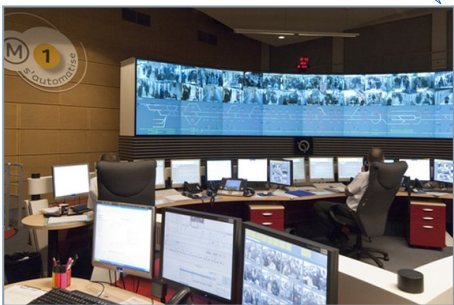
PREEMPT-RT

Power Generation



Debian Linux

Rail Automation



Safety-Certified  
Linux

Vehicle Control Systems



Yocto Linux

Building Automation



Industrial Automation



Public Yocto Layer

CNC Controls



Xenomai

Industrial communication



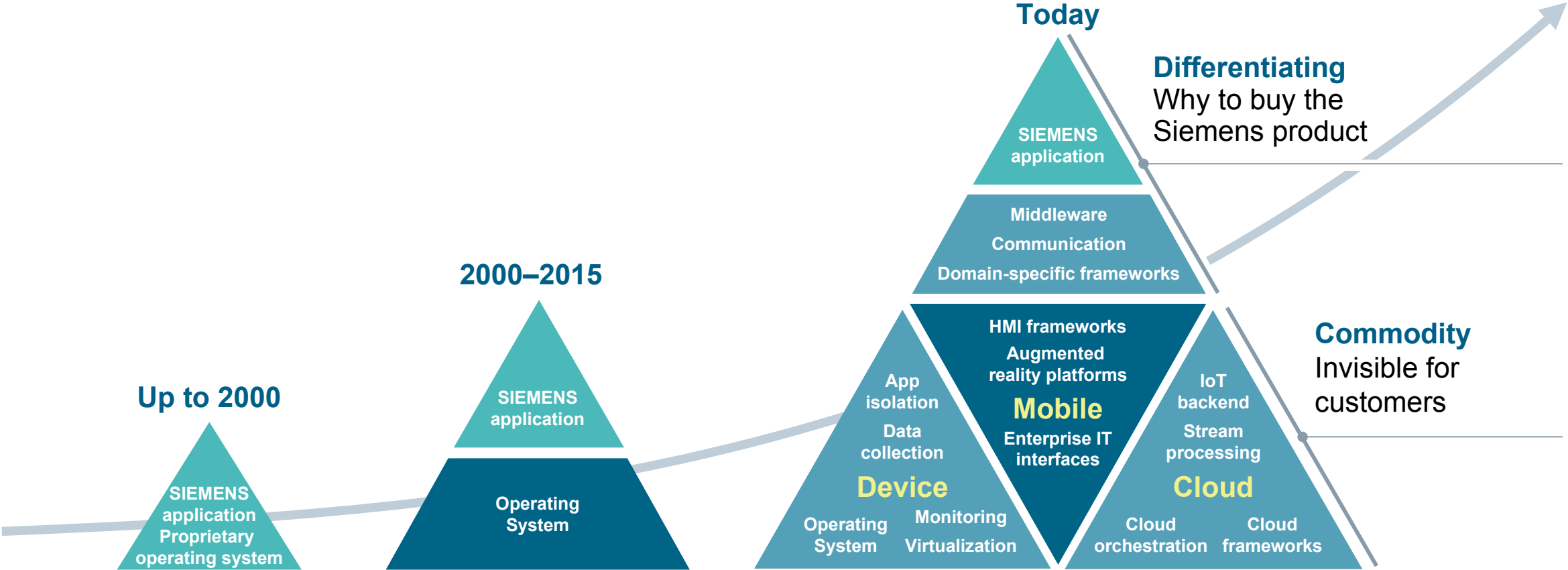
KVM on ARM

Medical Imaging



Xenomai on "Big Iron"

# More Software in Siemens Products – Focus on Differentiation





# Long-Term Availability & Stability

**SIEMENS**  
*Ingenuity for life*

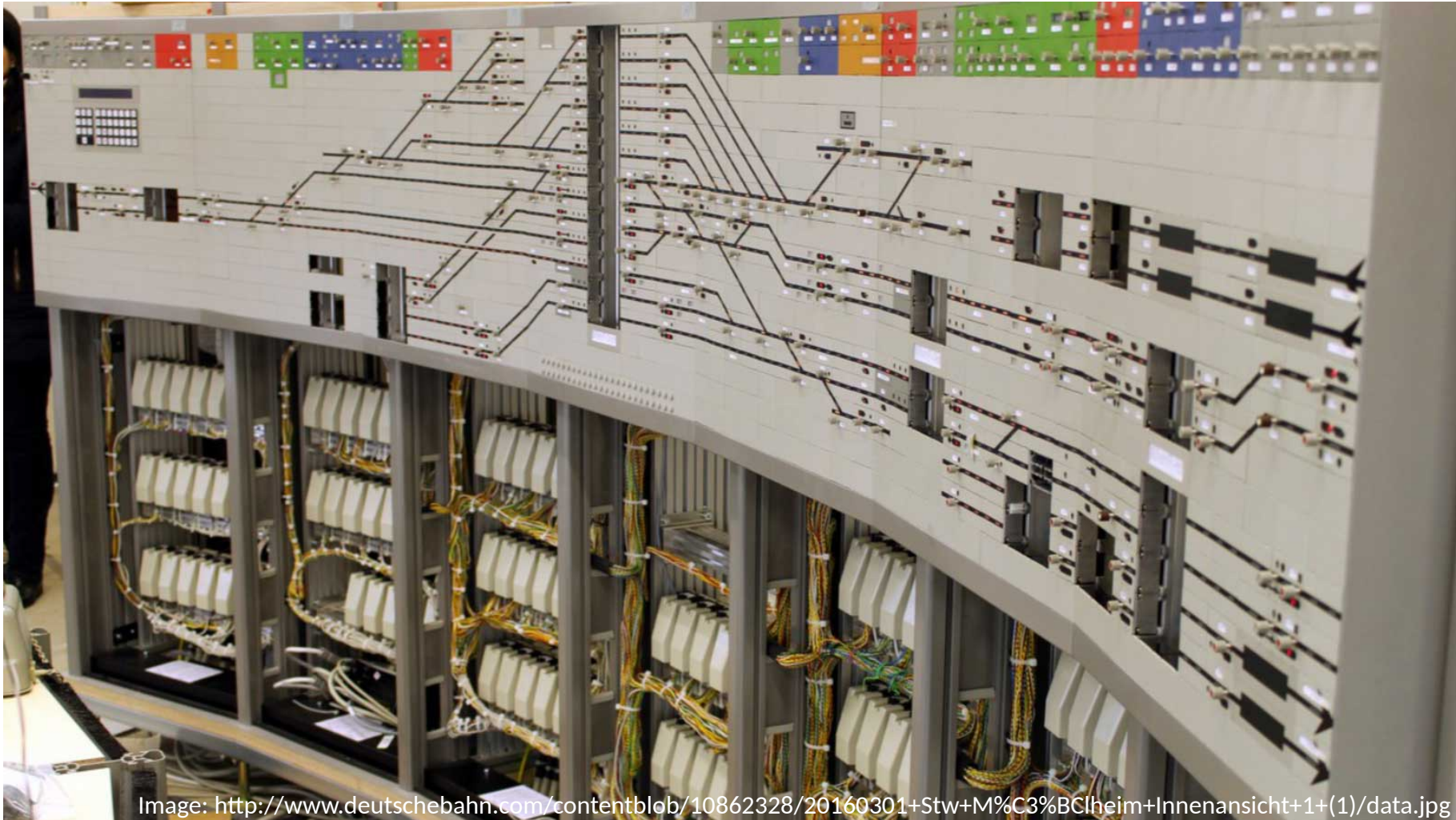


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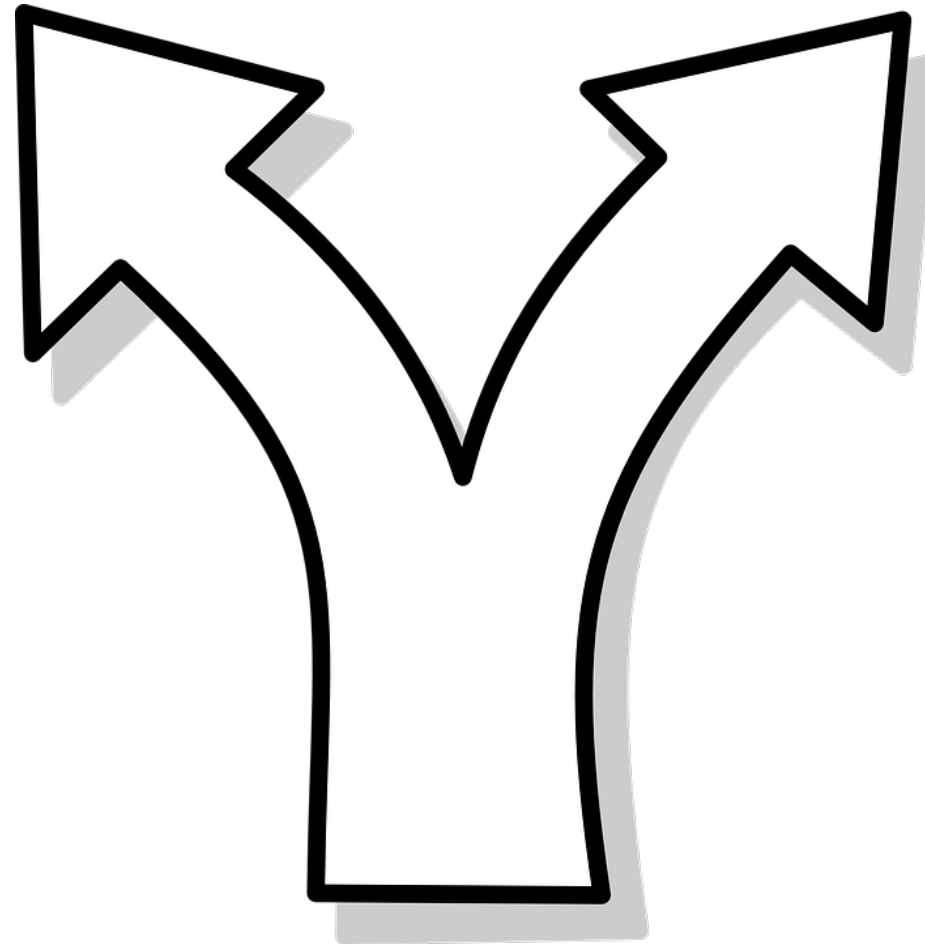


# Updating Long-Living Systems



# The Pain of Forks

**Self-inflicted**



**Supplier-provided**



# Upstream first!

# Becoming Part of the Community



Siemens

 **Repositories** 147

 **People** 203

 **Teams** 66

 **Projects** 1

 **Settings**

## Pinned repositories

Customize pinned repositories

≡ **embb**

Embedded Multicore Building Blocks (EMB<sup>2</sup>):  
Library for parallel programming of embedded  
systems. Star us on GitHub? +1

 C++  62  23

≡ **meta-iot2000**

SIMATIC IOT2000 Yocto Board Support Package

 BitBake  29  28

≡ **jailhouse**

Linux-based partitioning hypervisor

 C  721  139

e.g. <https://github.com/siemens>





———— CIVIL ————  
**INFRASTRUCTURE**  
———— PLATFORM ————

<https://cip-project.org>

## Extending Our Open Source Strengths





# Software License Compliance ... as Free Software



**Component  
Analysis Tool**



**Software  
Catalogue**

Thank you!



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# Embedded nux

## Corporate Competence Center