INDUSTRIAL USE OF MBE: ERICSSON EXPERIENCE

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OUTLINE

- ERICSSON USAGE OF MBE
- LESSONS LEARNED
- FUTURE CHALLENGES
- SUMMARY

Ericsson Usage of MBE

OUR PRODUCTS

Most important component is software

World’s fifth largest software supplier

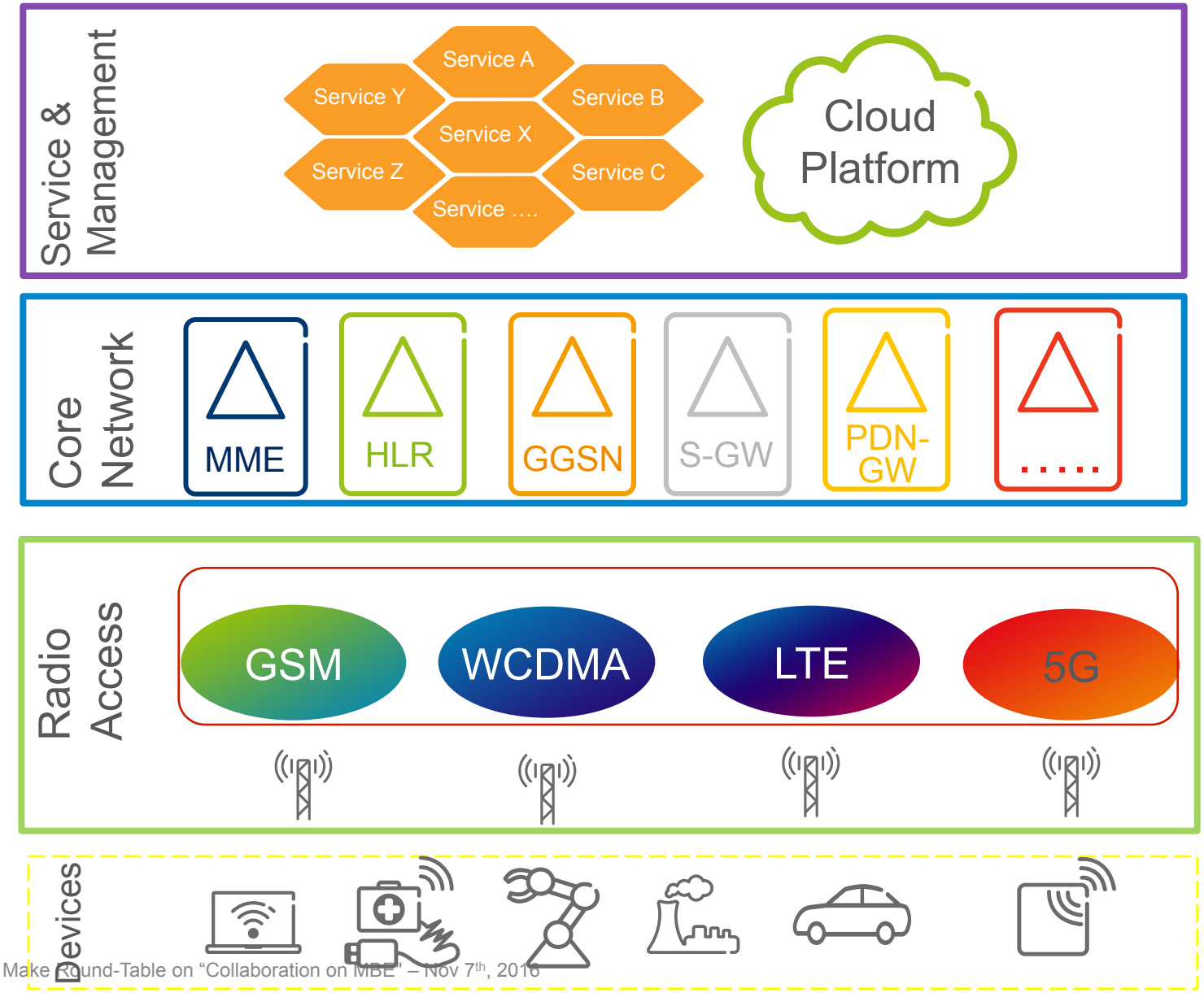
ERICSSON SYSTEM DOMAIN

Software for system management and services

HW platforms and software for core network

Diverse radio access platforms: HW and software

IPR and standards for system access



OPERATION &MAINTENANCE (O&M)

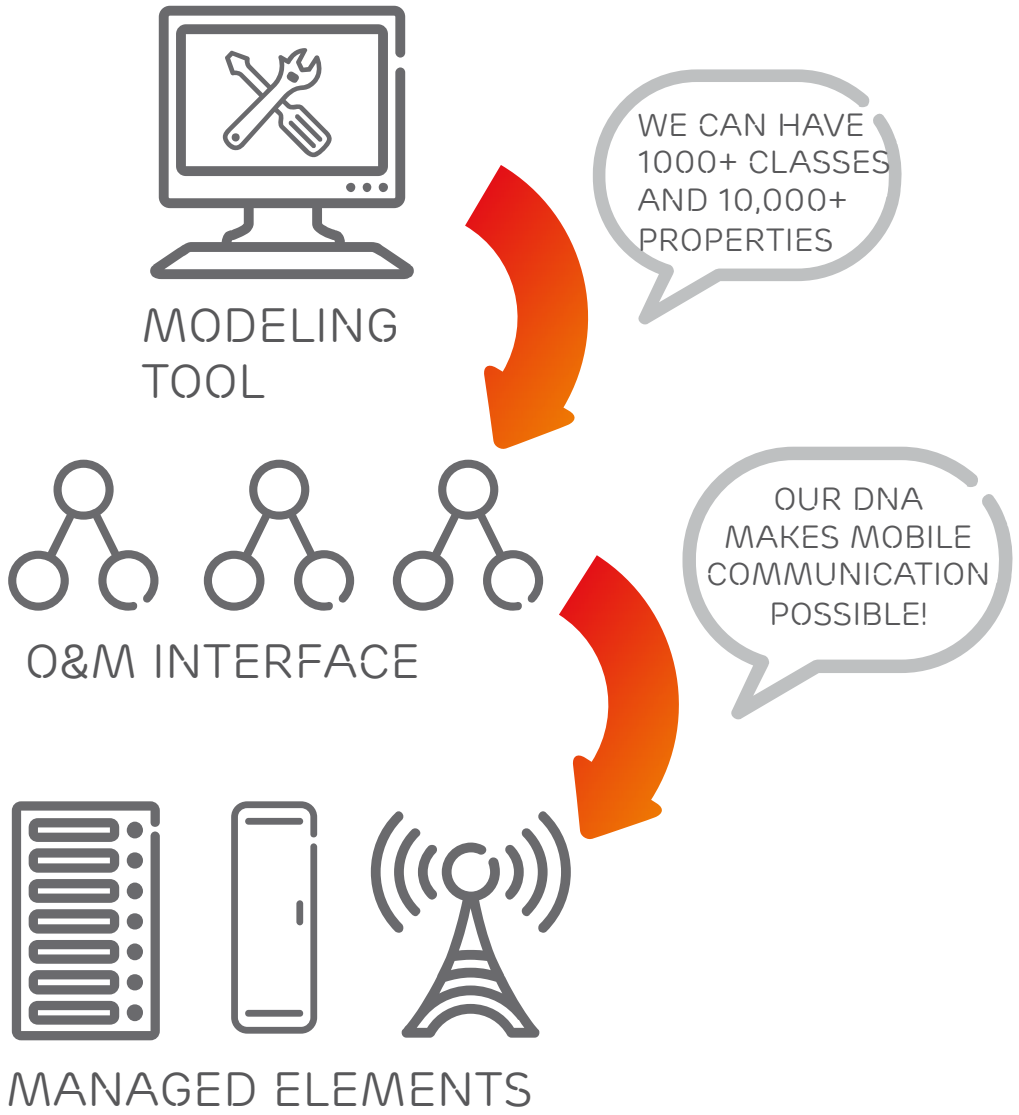
Modeling

Validation

Generation

Benefits

- Support for multiple profiles
- Automated transformations
- Advanced validation



SYSTEM MODELING – MBSE

Modeling

UML RT IBM ADOCUS

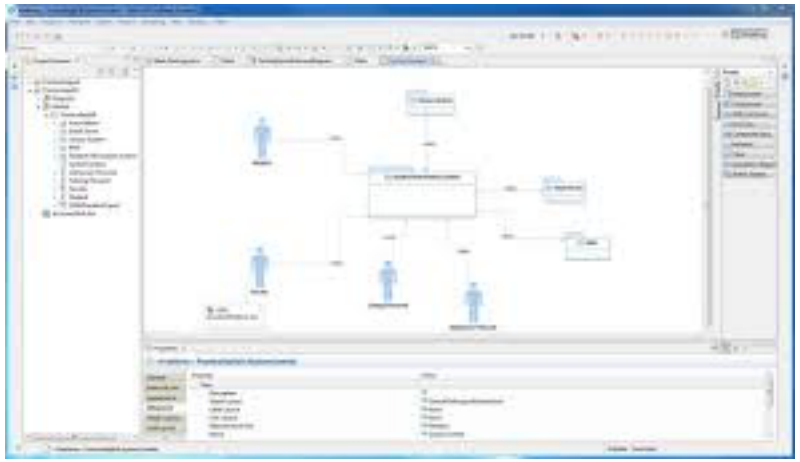
Validation

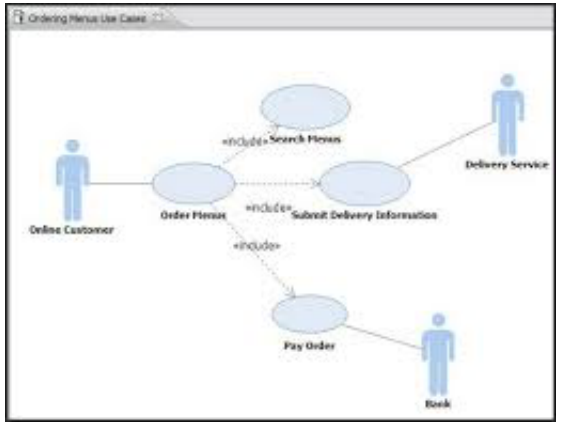
UML RT ADOCUS

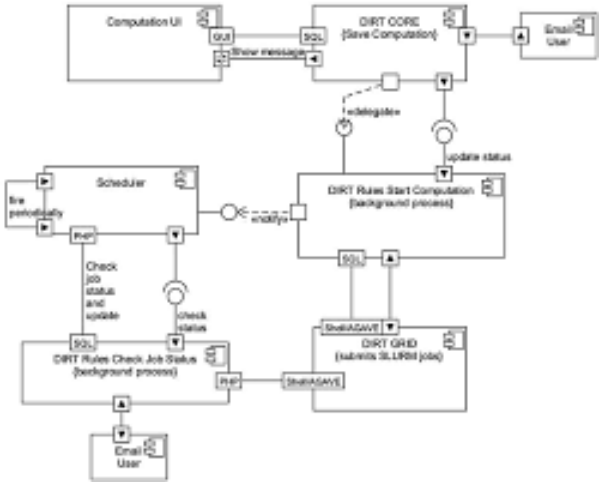
Generation

Benefits

- Reduce specification faults
- Move from document-driven process to “single source of information” approach







SW DESIGN/IMPLEMENTATION USING UML-RT

Modeling

UML RT IBM

Validation

UML RT

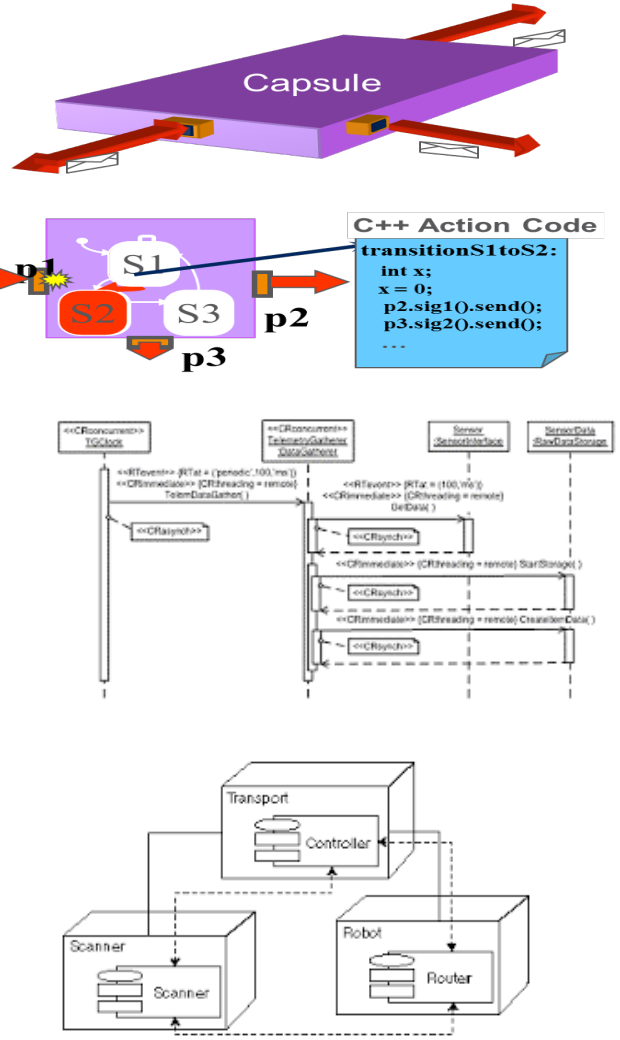
Generation

C++

Run-time system abstraction to hide underlying platform

Benefits

- Battle design implementation complexity using a subset of UML called UML-RT
- Capsule and hierarchical state-machine abstractions provide very powerful abstractions.



NETWORK ARCHITECTURE (NWA)

Modeling

With NWA proprietary DSL

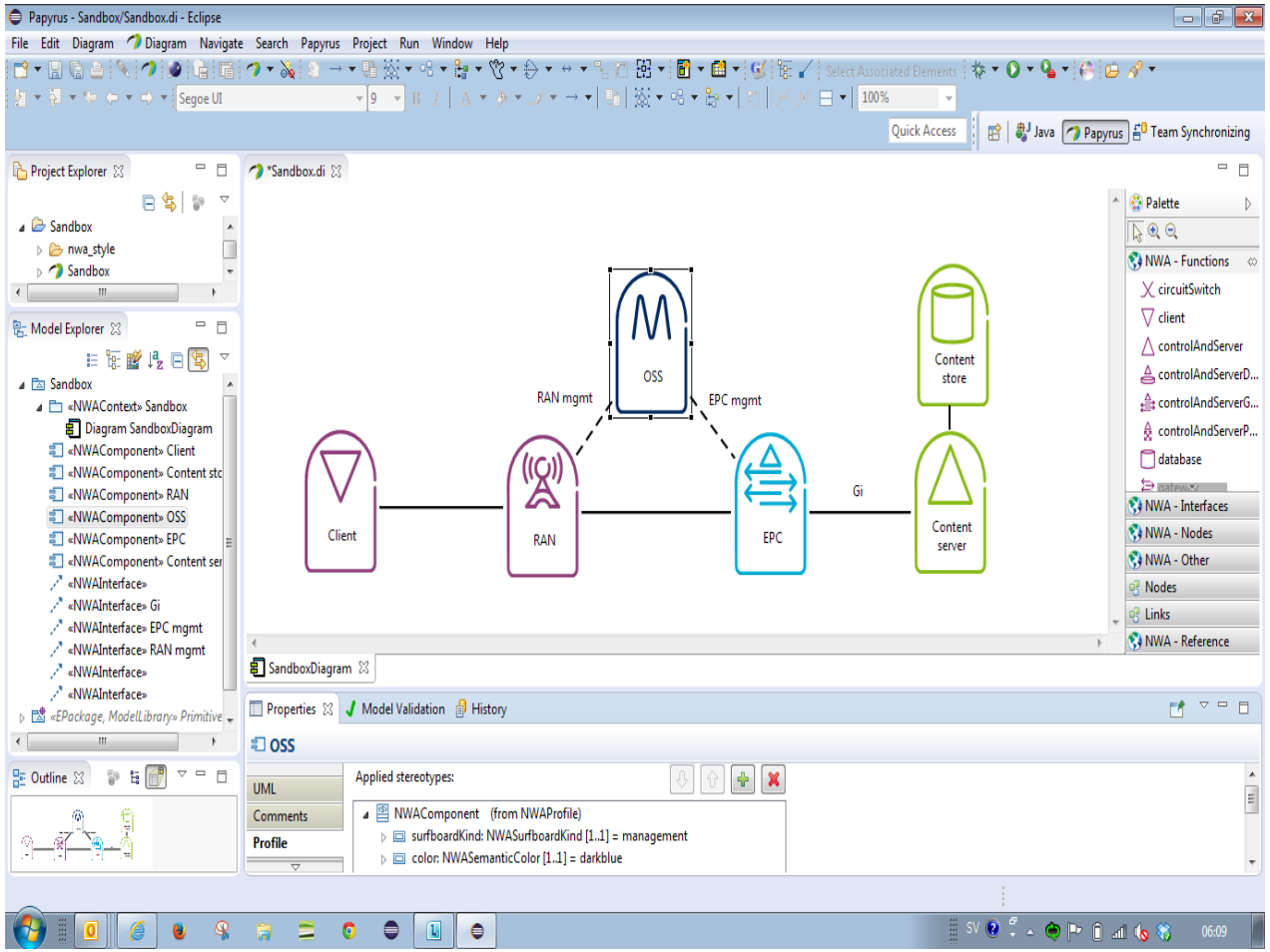
Validation

- In progress

Generation

Benefits

- Replace PowerPoint as main design tool
- Model versioning
- Potential development of advanced validation



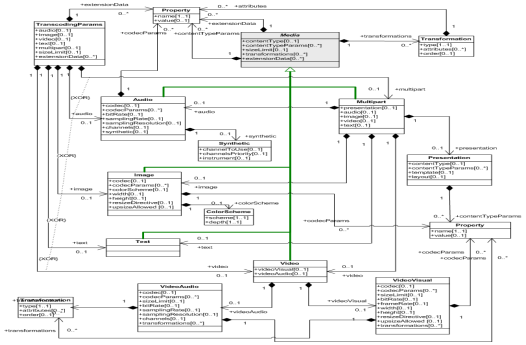
OTHER USAGES

Baseband

Enterprise Architecture/Business Process Modeling

Model-Based Testingz

THE IMPORTANCE OF MODELING



- UML modeling is currently used within Radio development unit for the following systems:
  - WCDMA – 80-90% of the SW + System design RBS
  - LTE – Large parts of the SW
  - GSM – System design RBS
  - Platform – 20% of the SW + System design parts
- The above business based on MBE corresponds to around 60% of the Ericsson yearly turnover of more than 200 Billion SEK ($ 27 Billion)

- Now working on development tool plan for 5G

Lessons Learned

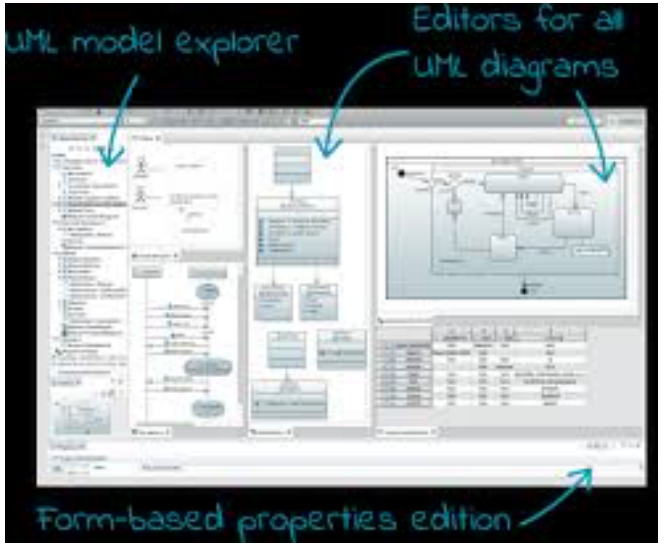
TOOLS NEED TO BE FIT FOR THE JOB

USER EXPERIENCE (UX)

- Tool usability
- Missing capabilities regarding key aspects
- Support for customization and DSL
- Need more and better integrations

NEED A COMMUNITY

MBE OR AGILE? NOT AN EITHER-OR



or

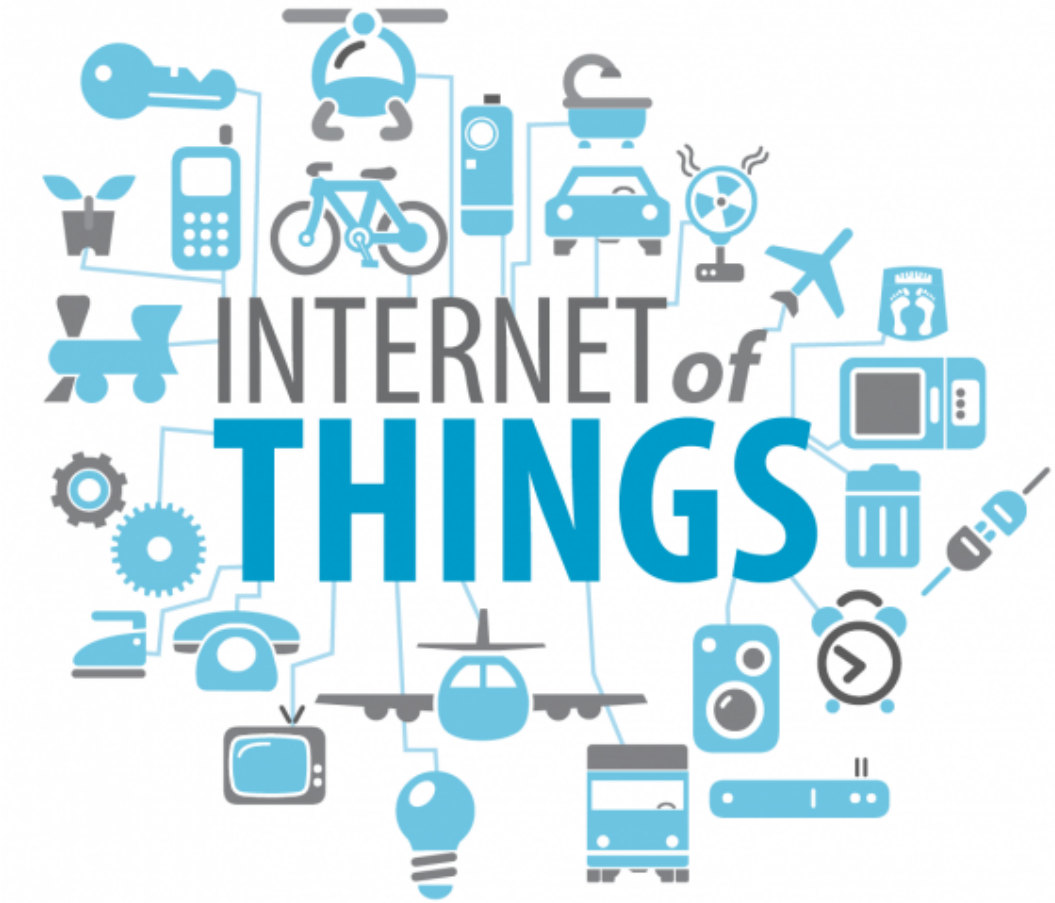
OPEN SOURCE IS NECESSARY

- Industrial-grade open source alternative
  - Open technology
  - Ability to independently develop required capabilities
  - Much simplified legal and business context
  - Enables fruitful collaborations and tech transfer
- Control of own destiny regarding modeling tools evolution
  - Eliminate vendor lock-in
  - Ensure long-term availability of key modeling tools
  - No forced migration
  - Ability to develop new tool features and integrations as required
- Long-term viability of open source modeling tools
  - Engage other end-user enterprises in core development of open source modeling tools around Papyrus
  - Encourage the use of open source modeling tools by academia and research institutions
  - Collaborate with academia and other research institutions in developing key MBE solutions

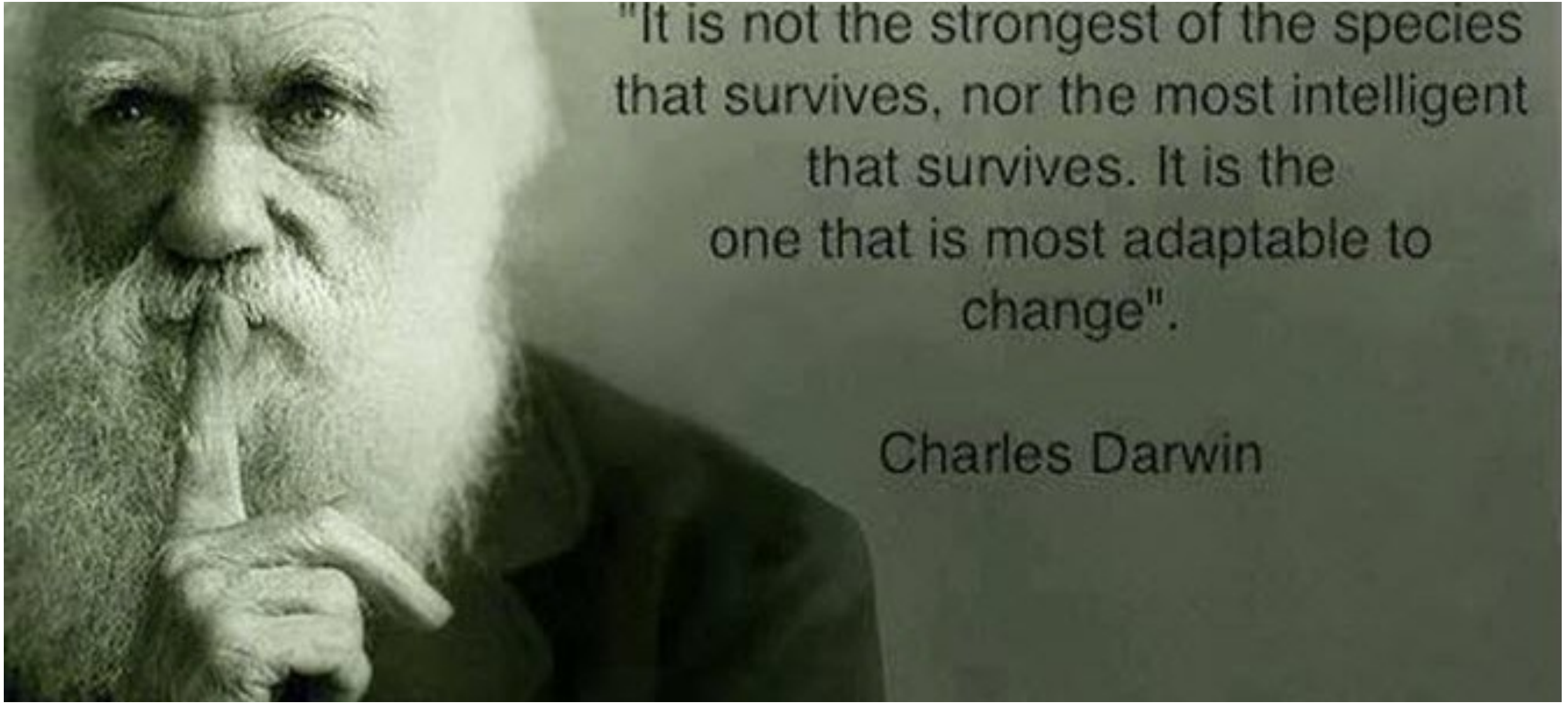
Future Challenges

5G AND IOT

What 5G will provide
Foundation for efficient industries and society
Multi domain performance
Massive machine type of communications
Energy Performance
Mass market personalized TV
Global standard
Critical machine type of communications

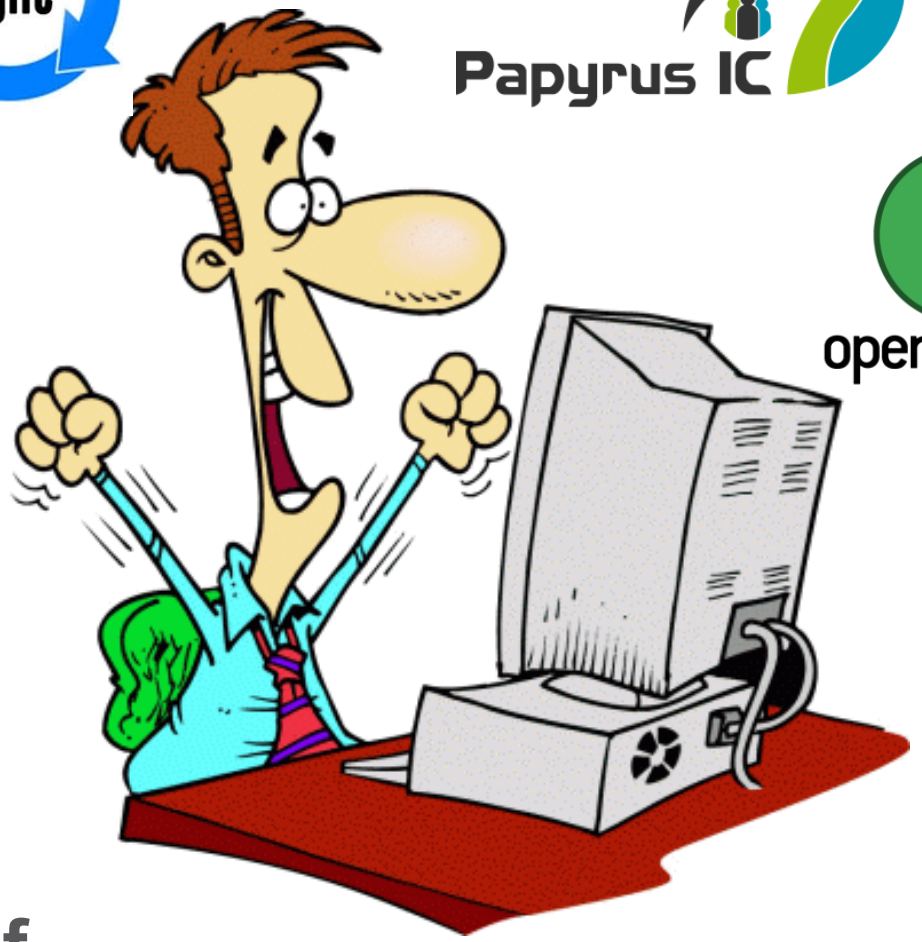

INTERNET of THINGS

BUSINESS AGILITY



MBE IS KEY

- Improved tool usability
- More capabilities regarding key aspects
- First-class support for customization and DSL
- More and better integrations

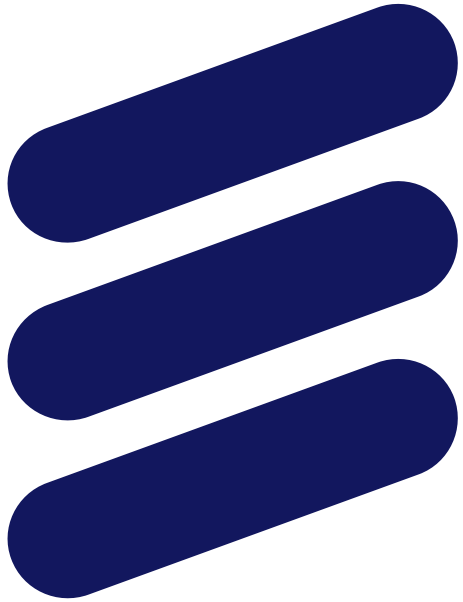


Can’t achieve the required level of business and development agility without MBE!

SUMMARY

- Ericsson has been using MBE at a large scale for over 20 years
- Lots of benefits, but current commercial proprietary tools are a main issue
- MBE is necessary to reach the required business and development agility
- Open source is a necessary condition to ensure future success

We need an open source MBE solution to get the tool evolution we need!



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