

DE LA RECHERCHE À L'INDUSTRIE

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# MDE WITH PAPYRUS

## novelties and beyond



**Florian Noyrit**

On Behalf of

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**ERICSSON** 

**Francis Bordeleau**

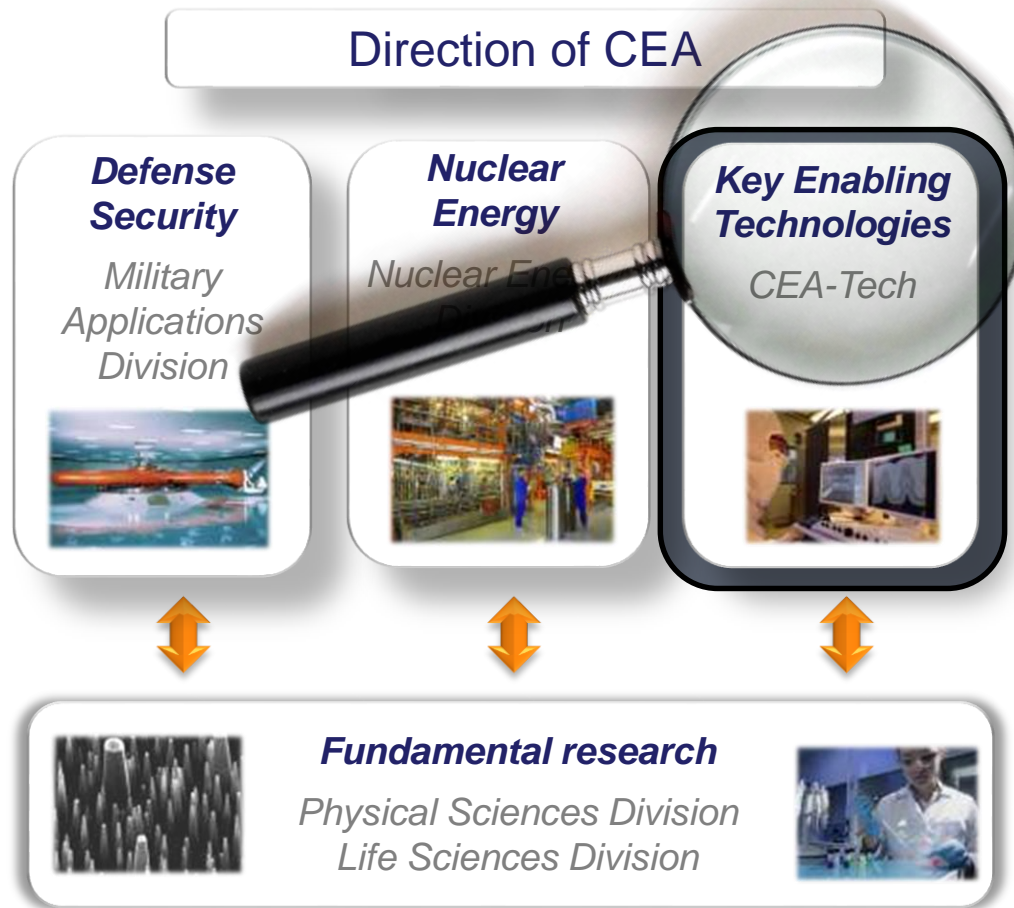
Ericsson, Canada

francis.bordeleau@ericsson.com

CEA is a major actor in research and innovation.

Technology

Science



- **16 000 people**
- **16 centers in France**
- Budget : 4,3€ billions
- 1 600 patents
- **4 000 publications / year**
- 150 startup created since 1984



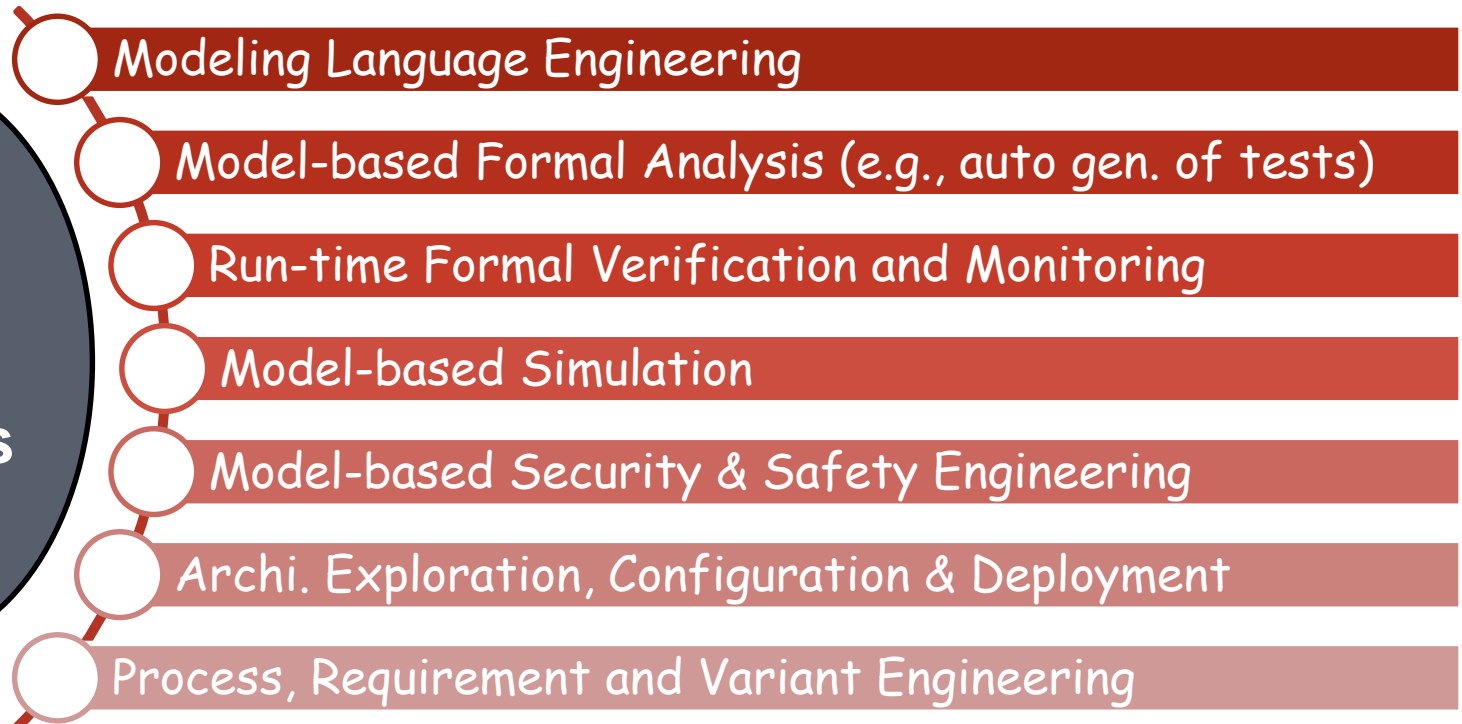


## Correct-by-construction design of safe CPS

A laboratory of 50 persons (+ 5 new permanent open positions for 2015... ;-))

- 33 permanent members + 17 non-permanent members including PhD students, post-docs and CDDs

Main  
research  
concerns



# Agenda



About Papyrus 1.1.3

Ericsson: Papyrus deployment

What next?



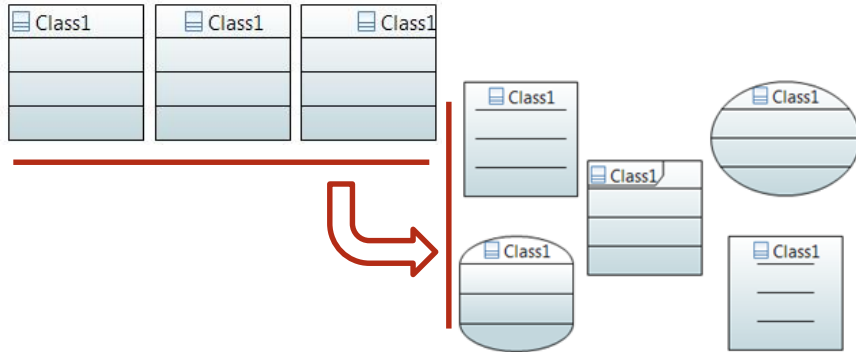


<http://www.eclipse.org/papyrus>

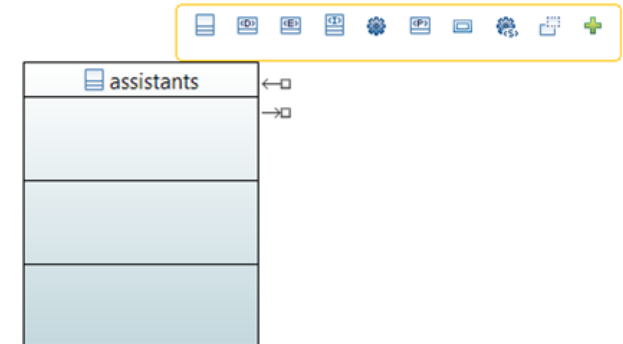
# THE MAIN CONCERNS OF THE PAPYRUS TEAM



## Dynamic shape customization



## Modeling Assistants



## Tree Table editors

				A
				◦ name : String [0..1]
1	☐ Class1			Class1
3		☐ Attribute1		Attribute1
5		☐ Class1		Class1
7		☐ ⚙ Operation1 (P...		Operation1
9			⚙ Parameter1	Parameter1

## Rich text support



## Information synchronization

Model ↔ View  
View ↔ View

## Diagram expansion

Extend existing diagram editors to create specific ones

## Support for ALF modeling





Project and model creation wizards



Papyrus Navigation



Search UI



Papyrus EMF Compare



Stereotype support



Activity diagram editor has been finalized



RSA import



Table filters (including numeric and regex filters)

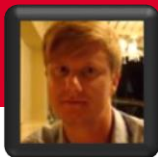


Improve CDO integration within Papyrus





# A world-class international development team



A. Henriksson  
Ericsson



S. Dhoubi  
CEA



A. Le Guennec  
Esterel Tech.



P. Langer  
EclipseSource



J.-M. Bruel  
IRIT



Ed. Willink  
Ed Willink T.



F. Jouault  
ESEO



B. Maggi  
CEA



C. Rivet  
Zeligsoft



M. Golubev  
Montages



F. Bordelau  
Ericsson



C. Janssens  
All4Tec



J. Tatibouët  
CEA



R. Schnekenburger  
CEA



F. Noyrit  
CEA



C. Damus  
Independant



G. Pascual  
All4Tec



K. Hussey  
Commiterati



P. Tessier  
CEA



S. Redding  
Zeligsoft



S. Gérard  
CEA



A. Tischenko  
Montages



E. Stepper  
es-computersys.



B. Marques  
CEA



O. Beaudoux  
ESEO



A. Radermacher  
CEA



P.-A. Gussander  
Nigus



O. Gürca  
CEA



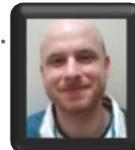
C. Dumoulin  
Independant



E. Seidewitz  
MDS



C. Letavernier  
CEA



Q. Le Menez  
CEA



M. Golubev  
Montages



S. Boyko  
Montages



M. Adam  
All4Tec



M. Elaasar  
Crossplatform Sw



Sébastien Gabel  
Esterel Tech.



M. E. Alferez Salinas  
CEA



A. Cucurru  
CEA



B. Selic  
Malina Software Corp.



J. Cadavid  
CEA

## #commits

- 1270 tasks closed (including bug fixing and enhancement) from July 2014 to June 2015!

## A large international community

#Committers	#Average commits PM	#Ext. contributors	#Ext. contribution accepted via gerrit PM
19	300	30	150

➔ External contributions via Gerrit



# PAPYRUS EXPLOITATION



“

For the safety study of its companion robots, Aldebaran uses Papyrus as complex system modelling tool.



Rodolphe Gélin,  
Research Director at Aldebaran Robotics

”



Goal is to develop an integrated modeling, development, validation and testing framework for leveraging the cost-efficient and reliable implementation of ETCS: Papyrus has been chosen for modeling concerns.



Atelier de Génie

Papyrus chosen for modeling control command system of next generation of nuclear plant.



2009

Esterel Tech. and CEA LIST create an innovative lab on  
**Critical systems and software development tools and processes**



2011

Sherpa Engineering and CEA LIST create an innovative lab on  
**Control engineering in the automotive domain**



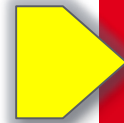
2012

All4Tec and CEA LIST create an innovative lab on  
**Model-based system engineering and safety analysis**



# Agenda

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What next?





# 5 Years of “Papyrusing”

Francis bordeleau, Ronan Barrett Ericsson AB

Based on a paper published at OSS4MDE '15

# Motivation



No license costs



Active  
research/support  
Community

# Xtext

Textual Integration



Simple Installation



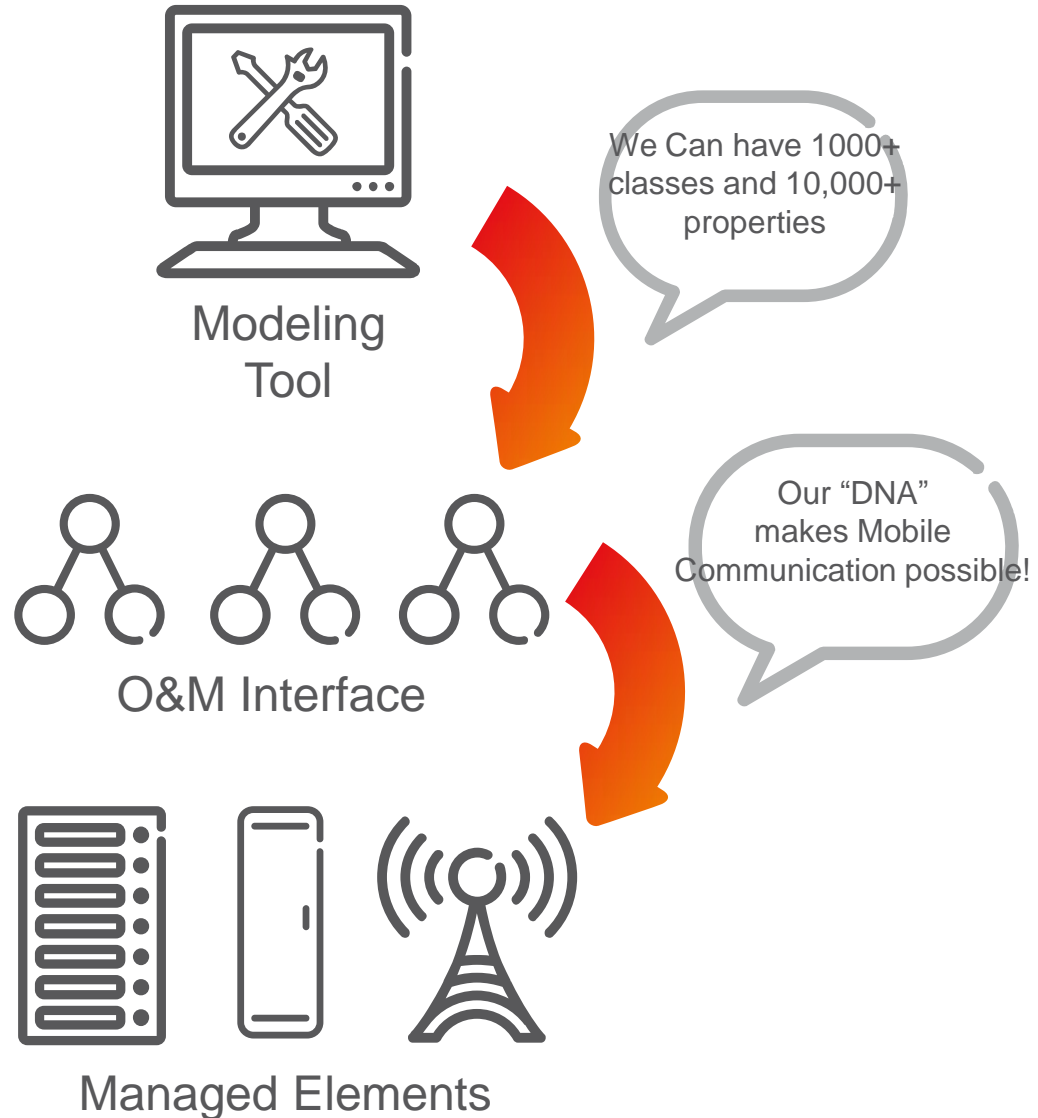
One install  
many tools



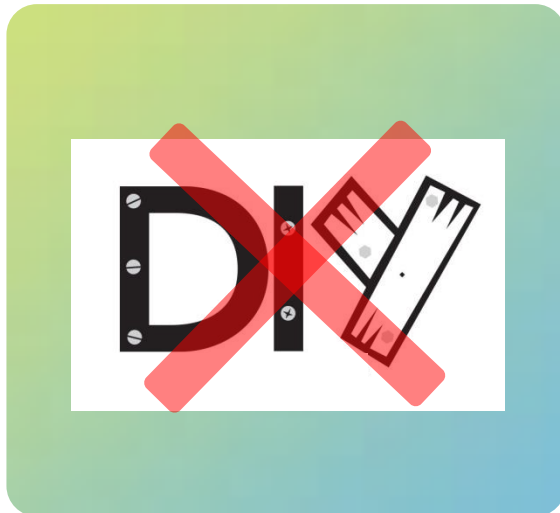
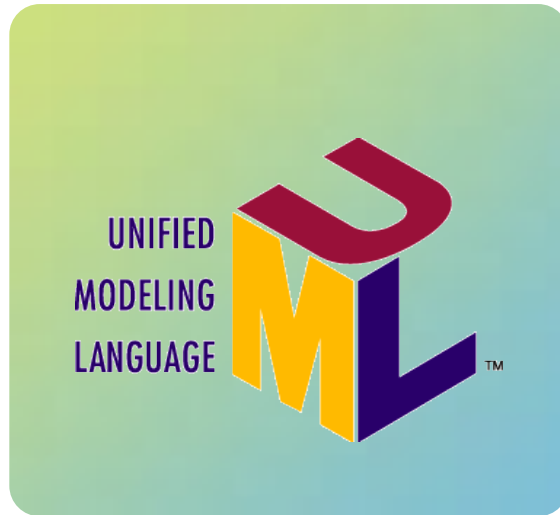
Collaborative  
development  
process



# Tool Use Case



# Assumptions





# Engagement

# Papyrus Engagement



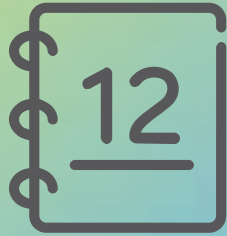
2010  
Helios

2015  
Luna

# Engagement Numbers



5x



5x



Bugs Filed

4x



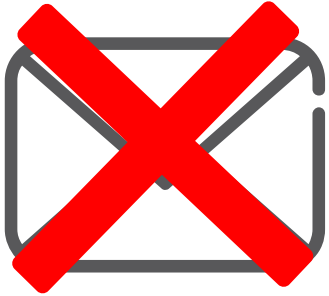
9x





# Lessons Learned

# Communication



Long Email



Write a Bugzilla



Ericsson  
Engineer



Papyrus  
Engineer



Call me!



Long Document



Screen Share

# How to Evaluate?



Your Needed Features

+

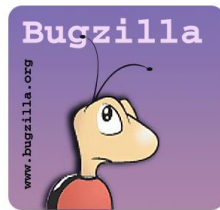


Your Test Coverage



Supporting Documentation

+



Your Evaluation



Preconceptions

=



O&M Modeling





# Conclusions



- › Is Papyrus good enough to be used in industry?
  - Yes it is in many, but probably not all, contexts today
  - If it doesn't meet your requirements then get involved
- › Don't try to build our own DSL/UML Tool
  - Instead become a contributor and together we can build a great tool
- › In open source there is no customer vendor relationship
  - Don't ask for non generic features
  - Communicate openly and effectively
- › Papyrus is only one part of a larger eco system
  - Manage integration of other components carefully
- › Expectations must be managed
  - No false starts
  - Don't release until you have the “right quality”



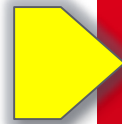
**ERICSSON**

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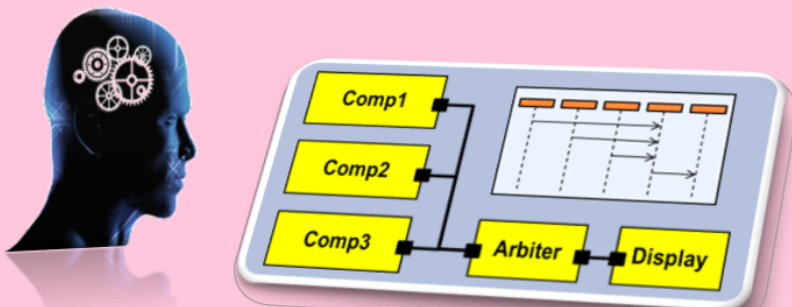
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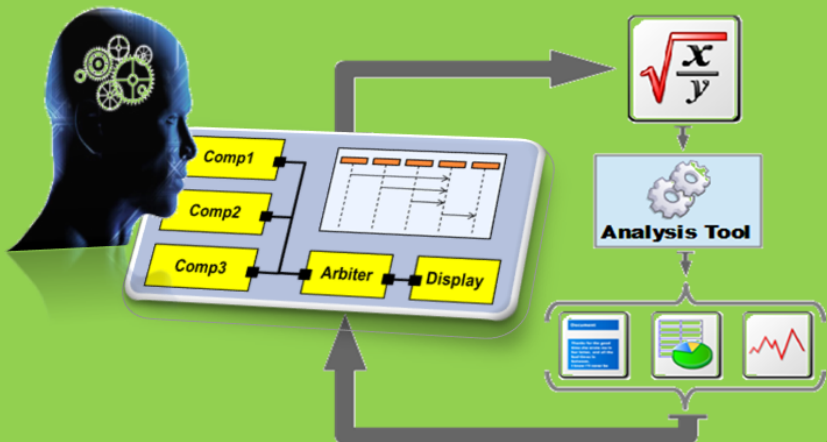
# IMPROVING MODEL EXPLOITATION: FROM MENTAL TO COMPUTER-AIDED ANALYSIS.

## Mental-based model analysis



**High-expertise**  
**Unreliable**  
**Not-scalable**

## Computer-aided model analysis



↘ **expertise**  
↗ **reliability**  
↗ **scalability**

# PAPYRUS EXTENSIONS FOR A FULL-FLEDGED AND POWERFUL MDE SOLUTION



**Safety/Security**



**Analysis-driven Architecturing**



**Requirements Engineering**



**Model-based formal-analysis (incl. MBTesting)**



**Product Line**

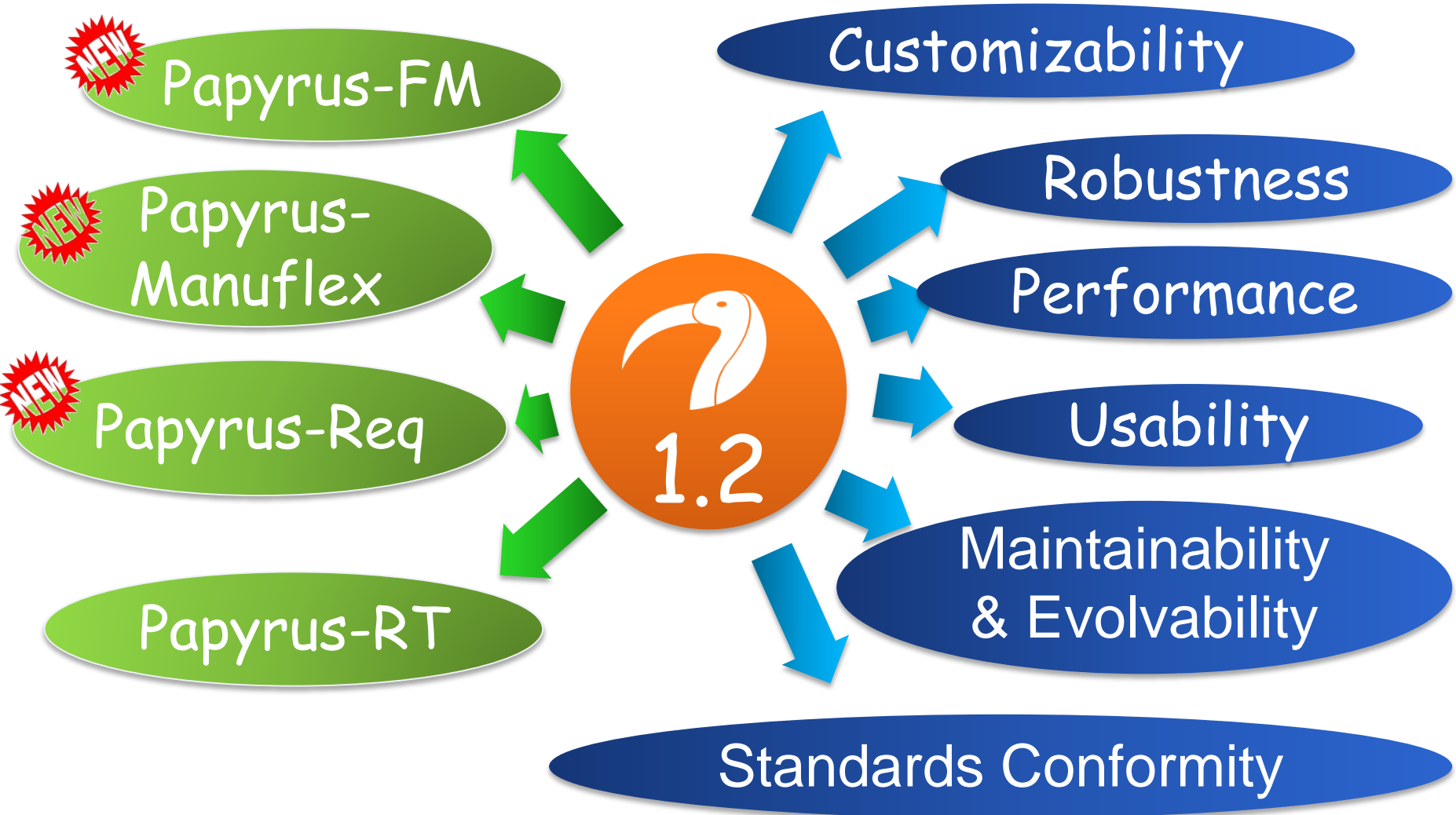


**Model-based Monitoring**



**Model-based Simulation**

# OUTLINE OF THE ROADMAP FOR PYPYRUS 1.2 (ECLIPSE NEON)





→ *A maintenance agreement for Papyrus*



**Commercial support**

✓ *Created middle of 2014,  
with trained Papyrus developpers*



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