ITEA 2

INFORMATION TECHNOLOGY FOR EUROPEAN ADVANCEMENT

openETCS

# *openETCS* itea2 Review

## WP7 – Toolchain Development

supported by:

Federal Ministry of Education and Research

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MINISTERIO DE CIENCIA E INNOVACIÓN

openETCS@ITEA2 Project

Michael Jastram

Munich, June 12th, 2014

# The Big Picture

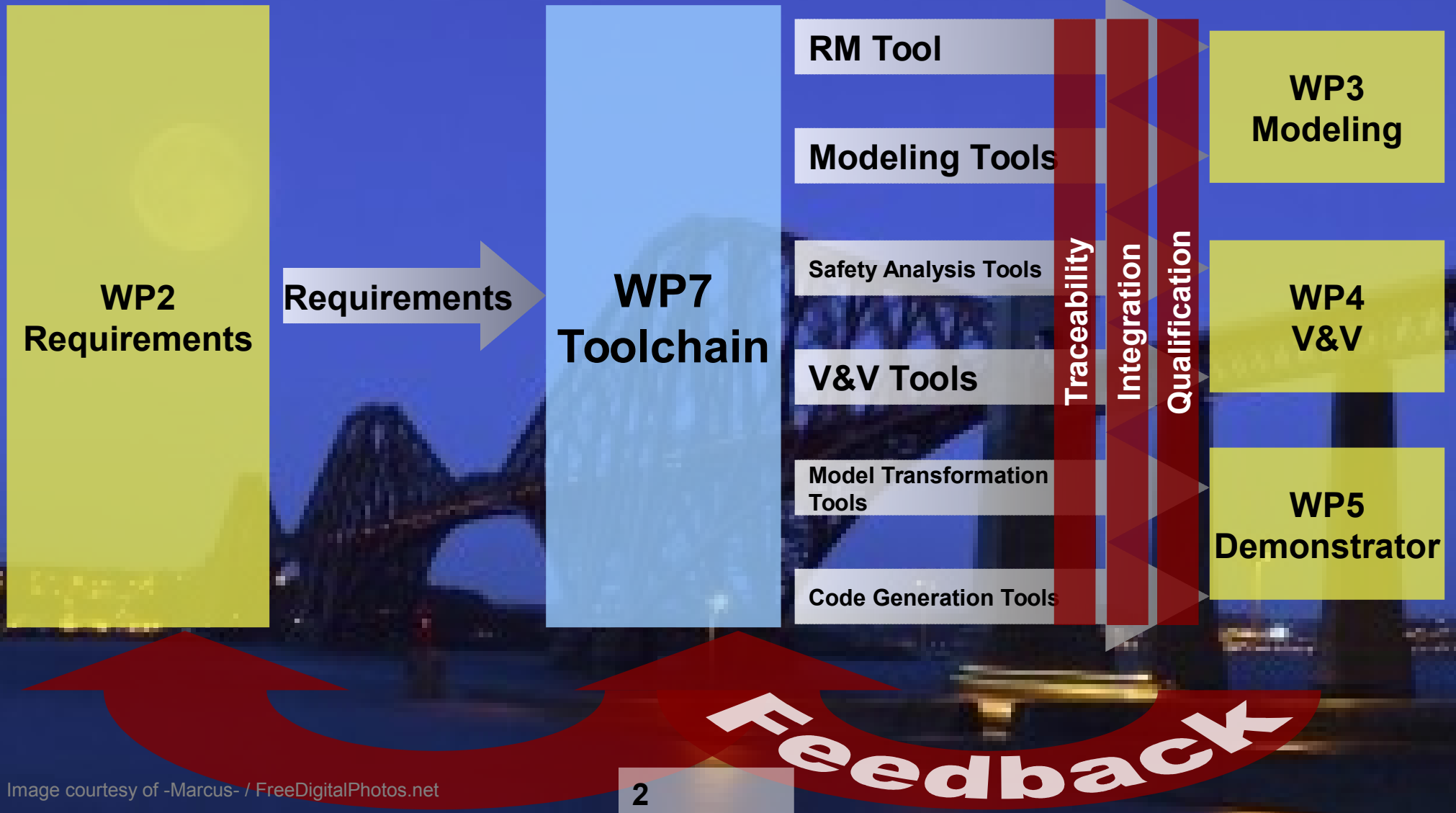
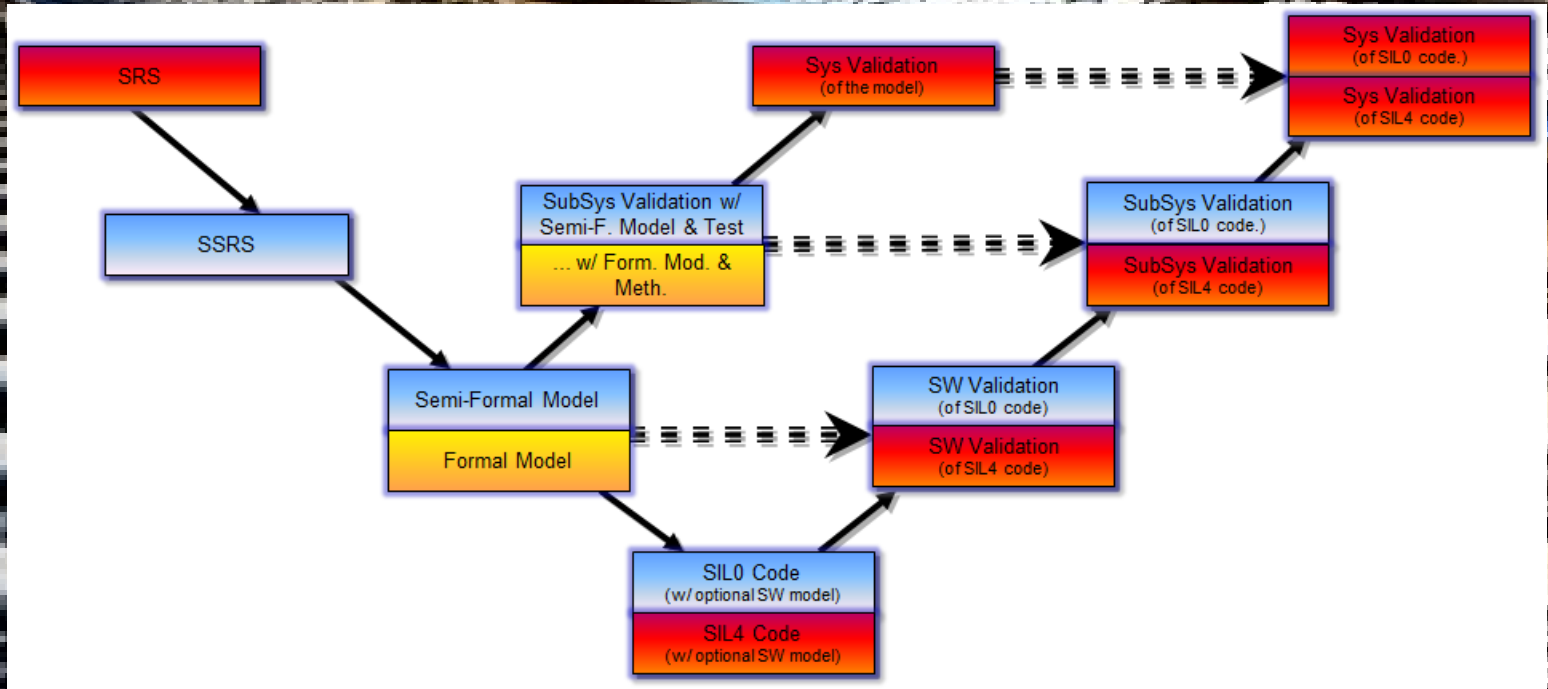



Image courtesy of -Marcus- / FreeDigitalPhotos.net

# An Integrated Tool Chain




Source: https://github.com/openETCS/requirements/tree/master/D2.6-9

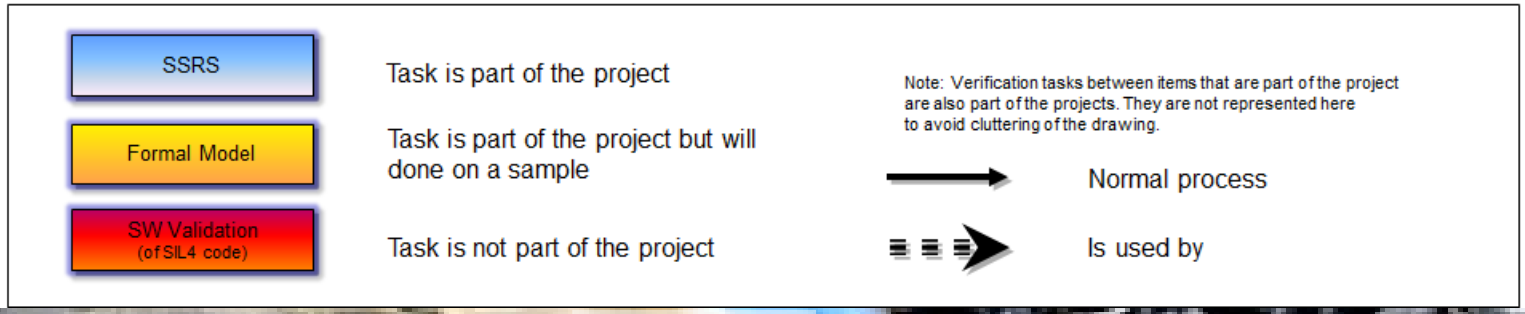



Image courtesy of graur codrin / FreeDigitalPhotos.net

# Workpackage Structure

WP7 **Toolchain**
Michael Jastram / Formal Mind

T7.1 **Primary Toolchain**
Marielle Petit-Doche / Systerel

T7.2 **Secondary Toolchain**
Marielle Petit-Doche / Systerel

T7.3 **Toolchain Development**
Cécile Braunstein / University Bremen

T7.4 **Ecosystem**
Jonas Helming / EclipseSource



Image courtesy of Vichaya Kiatying-Angsulee / FreeDigitalPhotos.net

# Timeline

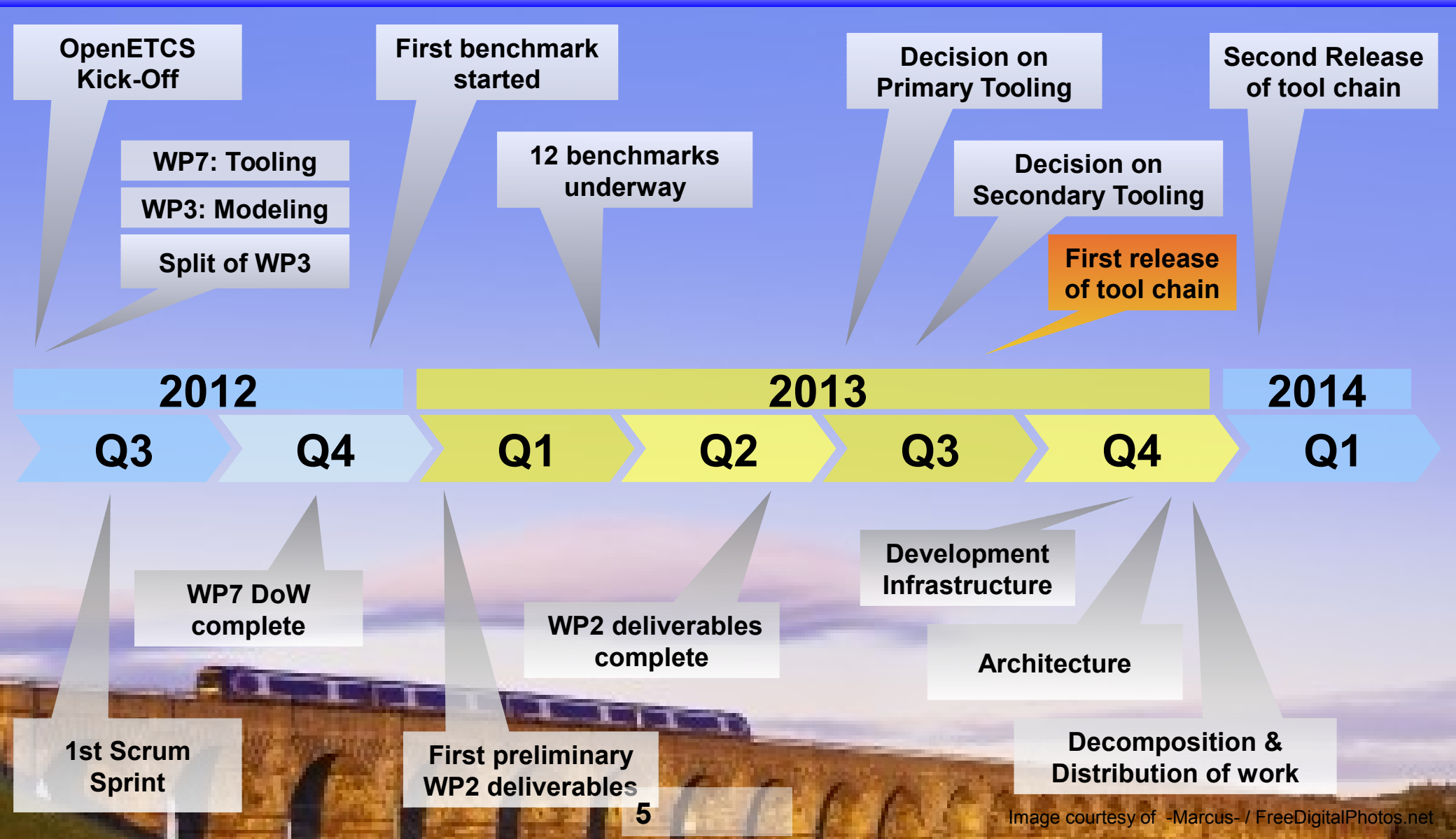





Image courtesy of -Marcus- / FreeDigitalPhotos.net

# 2014 – 2015: Regular releases

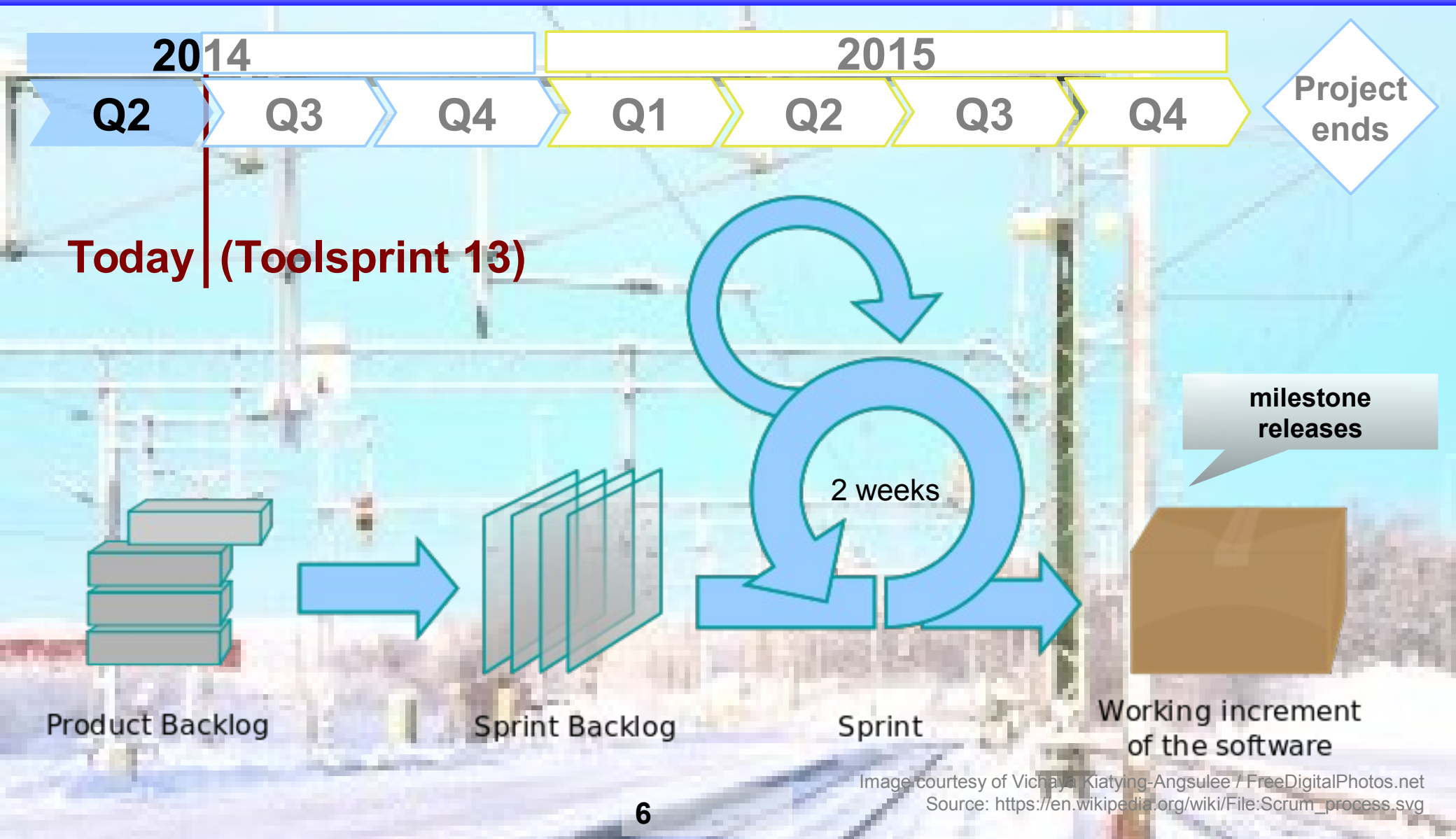



Image courtesy of Vichaya Kiatying-Angsulee / FreeDigitalPhotos.net
Source: https://en.wikipedia.org/wiki/File:Scrum_process.svg

# Status Deliverables

**D7.1: Evaluation Primary Tools: Delivered**

**D7.2: Evaluation Secondary Tools: Delivered**

**D7.4: First Toolchain Release: Delivered**

**D7.3: Qualification Process: Delayed**

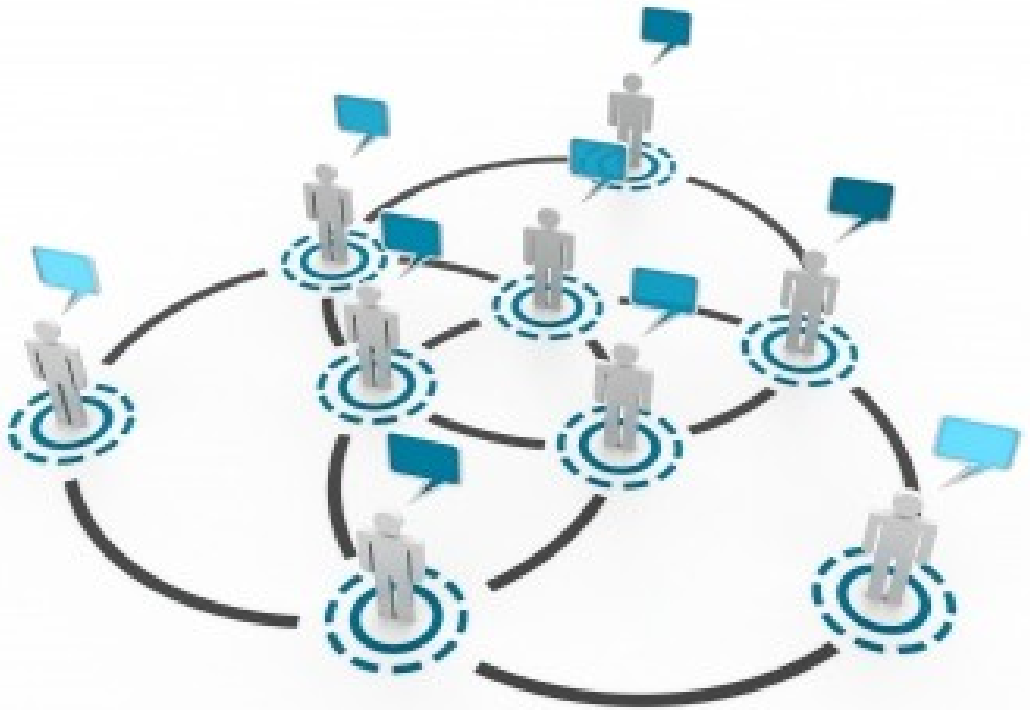
- Draft available since January 2014
- Lack of resources prompted to focus on toolchain development process
- Lack of feedback from the partners
- Lack of expert on tool qualification

# Collaborations

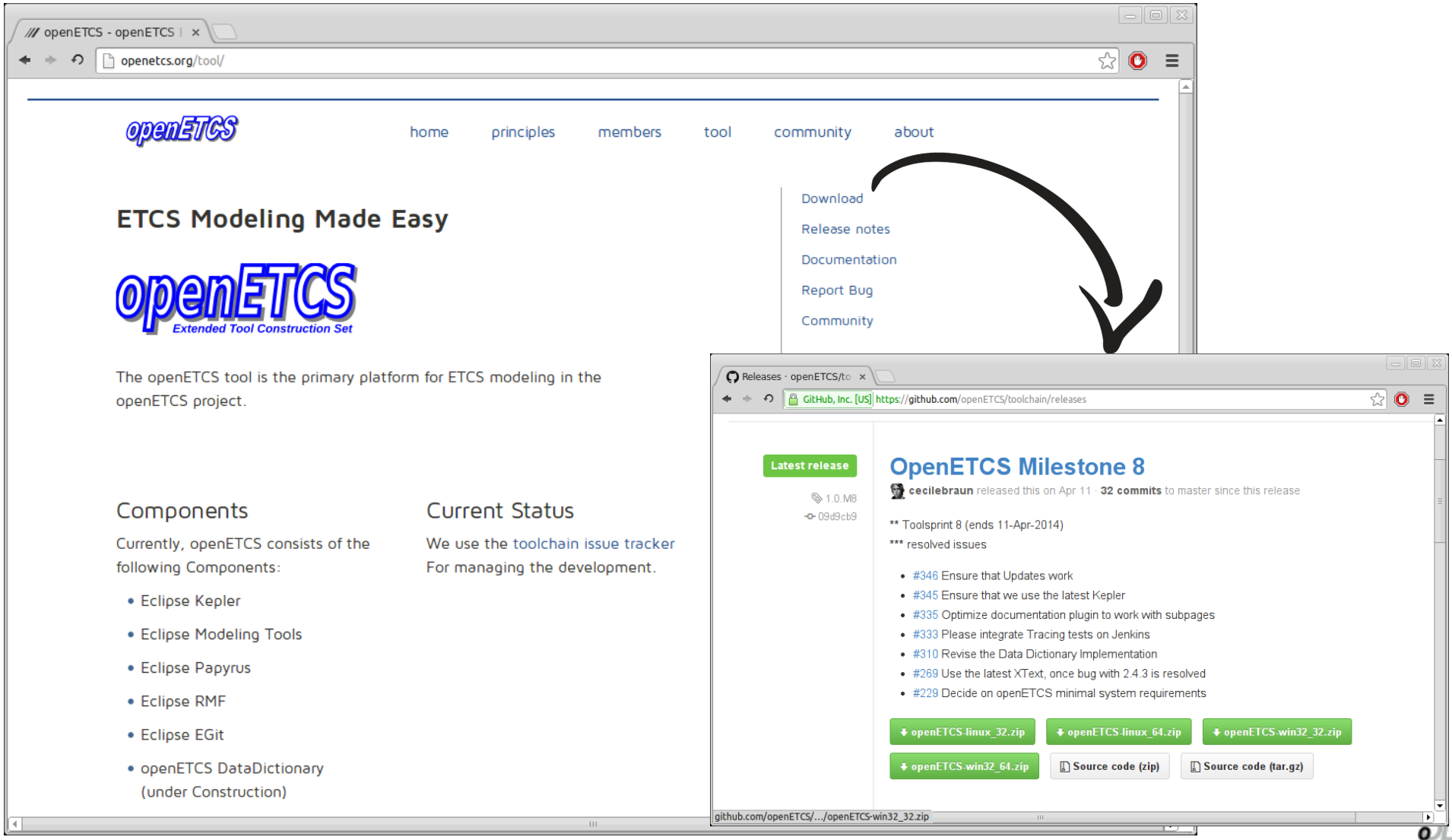
**https://github.com/openETCS/toolchain/wiki/Collaborations**

**Delegates maintain contact with these projects:**

- **Polarsys (aka OPEES, aka Topcased)**
- **shift2rail**
- **Crystal**
- **SAFE**
- **SafeCap**
- **VeTeSS**
- **EATS FP7 project**
- **OpenRBC**
- **Amalthea**
- **OpenCOSS**

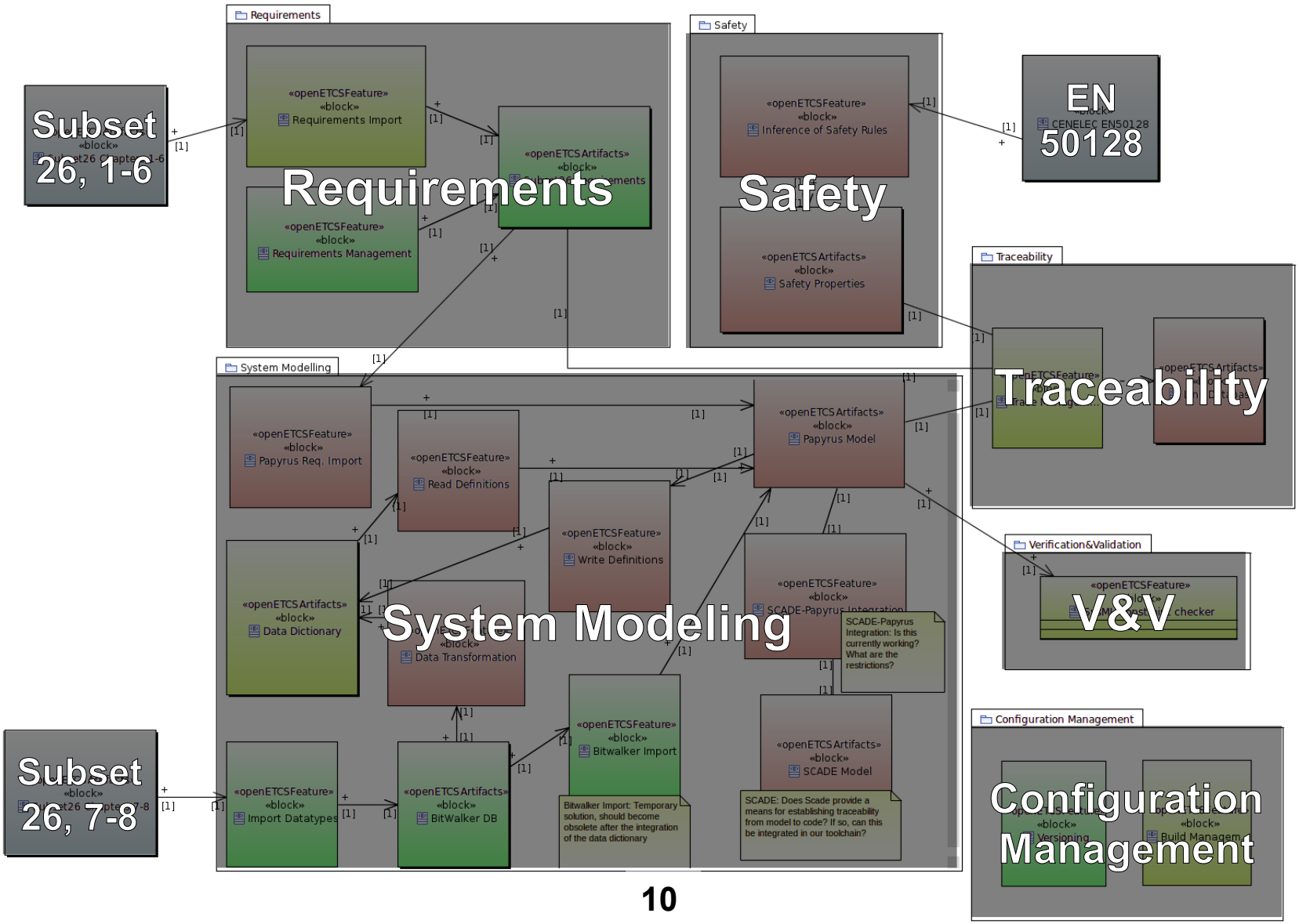


# openETCS:
# open Extended Tool Construction Set



# Feature Overview

**https://github.com/openETCS/toolchain/wiki/Feature%20Overview**



# Product Backlog (uses gitHub infrastructure)

## Product Backlog

### As a developer

#### I want to have clear development guidelines

- #70 Write a license guideline *2013-08-02 09:48:00*
- #249 Document the release process *2014-01-23 09:15:07*
- #254 Document the tool qualification process *2014-01-28 09:49:37*
- #322 Provide project specific settings *2014-03-18 03:20:10*
- #338 Document the feature/plug-in integration process for developer *2014-03-27 10:19:31*

### As a modeler

#### I want to get started quickly

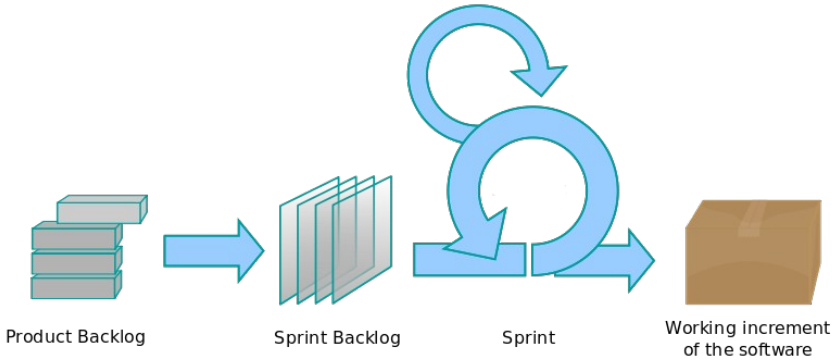
- #243 Automate initial Git clone *2014-01-14 13:22:14*
- #257 Include Java in the installation (without the need for admin rights), so that all openETCS features are available. *2014-02-03 13:43:25*
- #263 Create an OpenETCS perspective and make it the default perspective. *2014-02-04 13:14:45*
- #275 Write a tool chain user guide *2014-02-11 09:30:04*
- #315 Automate the generation of the documentation wiki *2014-03-14 08:12:57*
- #330 Documentation: Provide high-level overview and terminology *2014-03-21 10:23:29*

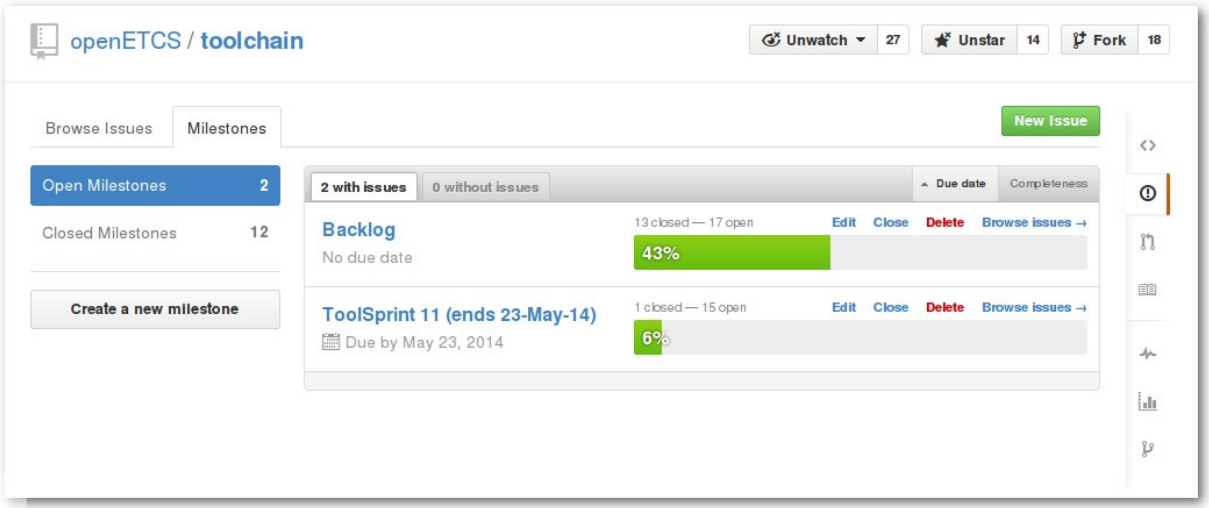
#### I need to access Subset-26

- #283 Automatic import from subset-026 WORD document to ReqIF *2014-02-13 09:26:15*

#### I need to work on my models in a team environment

- #290 Complete problem description for Model Versioning and collaborative work. *2014-02-18 08:54:47*
- #294 Provide a model organisati... *...20 08:51:21*



# Demo




Image courtesy of Stuart Miles / FreeDigitalPhotos.net

# ERTMSFormalSpecs (EFS)

- **Open Source Modeling Tool used for cross-validation by WP4**
- **65% of requirements modeled to date**
- **Improved Tool**
  - Improved structural editor
  - Flexible views
  - Graphical view of the model
  - Better reporting and communication
  - Animation support for tests
- **.NET based, therefore no plans to integrate with openETCS tool**
- **Demo by Laurent Ferier later today**

# Escalation: WP Objectives endangered

## Transition from Phase 1 (Analysis) to Phase 2 (Tool Development) unveiled problems:

- **Technology not as mature as expected**
  → more development required
- **Important Skills are missing**
  → Easy tasks take extremely long
- **Resources are Fragmented**
  → high relative overhead


Image courtesy of David Castillo Dominici / FreeDigitalPhotos.net

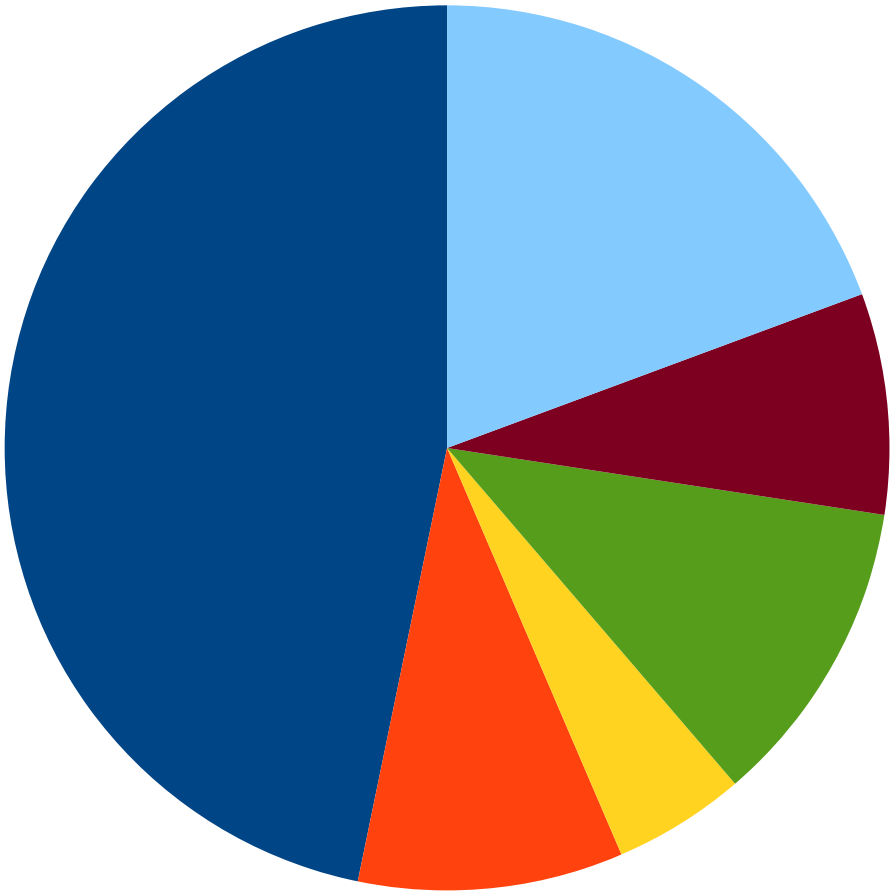
# Escalation: Technology Maturity

**“You get what you pay for”**

- **Topcased/PolarSys much less mature than expected**
  - Papyrus is the only usable PolarSys Component
  - CEA 100% fixing Papyrus issue (unspecific to openETCS)
  - No mature Traceability solution available
- **ProR/RMF (Requirements) needs significant work**
  - Many “standard” functions still missing
  - Performance issues
- **Minor issues eating up resources**
  - Java 7 in enterprise environment is tricky
  - Providing cross-platform support
  - Building and maintaining infrastructure (update sites, build server, documentation infrastructure, etc.)

# Escalation: Resource Situation

| Status | |
|---|---|
| active | 2.9 |
| exhausted | 0.6 |
| inactive | 0.3 |
| Papyrus | 0.7 |
| PM/Leadership | 0.5 |
| research | 1.2 |
| **Total Result** | **6.2** |




**At first glance, not too bad:**

- 60% active (incl. Papyrus)
- 20% research
- 20% overhead, exhausted and inactivity



Image courtesy of David Castillo Dominici / FreeDigitalPhotos.net

# Escalation: Who can Develop Software?

| Skill | Status | |
|---|---|---|
| Eclipse | active | 0.3 |
| | exhausted | 0.6 |
| | Papyrus | 0.7 |
| | PM/Leadership | 0.5 |
| Learning Eclipse | active | 1.8 |
| No Eclipse | active | 0.8 |
| | inactive | 0.3 |
| | research | 1.2 |
| **Total Result** | | **6.2** |

**Reason to worry:**

- **Only 5% of Eclipse development active (excluding Papyrus)**
- **30% of active participants learning**



Image courtesy of David Castillo Dominici / FreeDigitalPhotos.net

# Escalation: Fragmentation

| Partner | PY 2014 | Status | Skill |
|---|---|---|---|
| CEA | 0.7 | Papyrus | Eclipse |
| SQS | 0.7 | active | No Eclipse |
| Rostock | 0.7 | research | No Eclipse |
| Bremen | 0.6 | active | Learning Eclipse |
| Formal Mind | 0.5 | PM/Leadership | Eclipse |
| LAAS | 0.5 | active | Learning Eclipse |
| ERTMS Solutions | 0.5 | research | No Eclipse |
| Systerel | 0.5 | exhausted | Eclipse |
| Toulouse | 0.4 | active | Learning Eclipse |
| Fraunhofer | 0.3 | active | Eclipse |
| Mitsubishi | 0.3 | active | Learning Eclipse |
| Alstom | 0.1 | inactive | No Eclipse |
| ALSTOM Transport | 0.1 | inactive | No Eclipse |
| EclipseSource | 0.1 | exhausted | Eclipse |
| Institute Telecom | 0.1 | inactive | No Eclipse |
| TWT | 0.1 | active | No Eclipse |

# Escalation: Possible Solutions

## Problem: Technology Maturity

- **Use of proprietary technology**

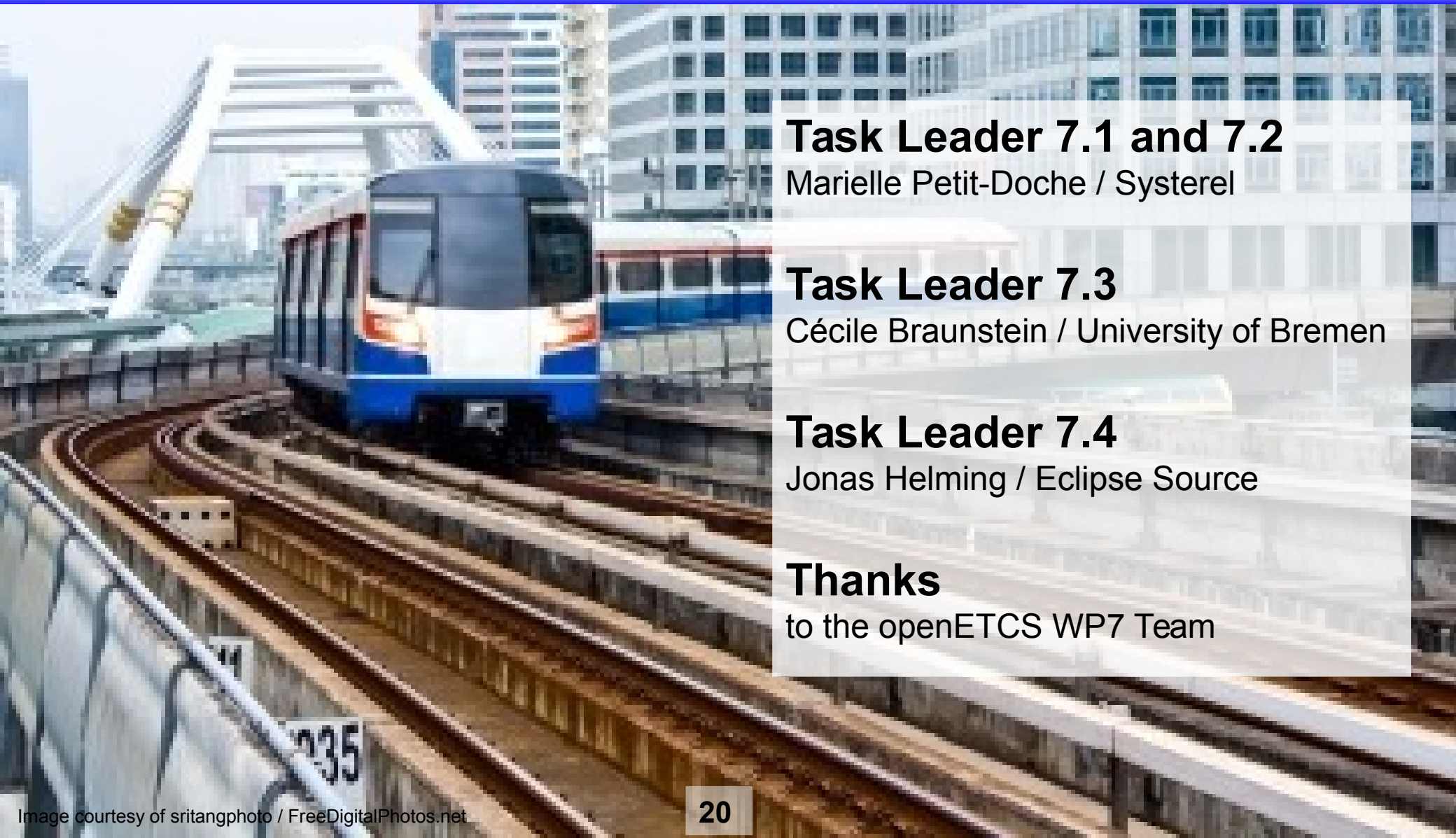
## Problem: Missing Skills

- **Training**
- **Get new partners with the right skills by picking up French funds**
- **Spend funds to hire experts**

## Problem: Fragmentation

- **Aggregate resources:** Few partners with many resources, not many partners with few.
- **Build a core team:** Find at least 3 team members (better 4) with the right skills that work full time on WP7.

# Thanks to the team



**Task Leader 7.1 and 7.2**
Marielle Petit-Doche / Systerel

**Task Leader 7.3**
Cécile Braunstein / University of Bremen

**Task Leader 7.4**
Jonas Helming / Eclipse Source

**Thanks**
to the openETCS WP7 Team

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