Quality of FLOSS development
Yes, OMM can!

Presentation:

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10$^{o.}$ FISL/ Porto Alegre/June 24th, 2009

The context

QualiPSo project is...

The OMM – Overview

Inside the OMM

OMM for FLOSS integrators

Summary

More info

FLOSS[1] is not new concept but IT economic context is changing

Economies are evolving from product orientation to service orientation

FLOSS is a chance for industries to foster growth and increase competitiveness

(1) Free Libre Open Source Software

Qualips — Quality Platform for Open Source Software

Large perspectives…   … but still uncertainties

- *A chance for enterprises & governments*

- *A chance for IT industries in Europe & emerging countries*

→ Legal issues?
→ Business models?
→ Interoperability?
→ Know how?
→ Quality?
→ Maturity?
→ Industrialization?
→ Support?

A unique global alliance that facilitates the use of trusted low-cost, flexible open source software within industries and governments, fuelling innovation and competitiveness.

The largest FLOSS project funded by the European Commission under its sixth framework program (FP6), as part of the Information Society Technologies (IST) initiative

18 founding members, across Europe, Brazil and China

QualiPSo Competence Centers as instantiation of project outcomes

IT IS ALL ABOUT TRUST!

Trust cannot be claimed without being proved!!!

To define and implement **technologies**, **procedures** and **policies** to <u>leverage</u> FLOSS development current practices to sound, well recognized and established <u>industrial operations</u>.

Dismiss the popular myths against FLOSS that prevent the industrial commitment

Prove the quality of the FLOSS for the industry

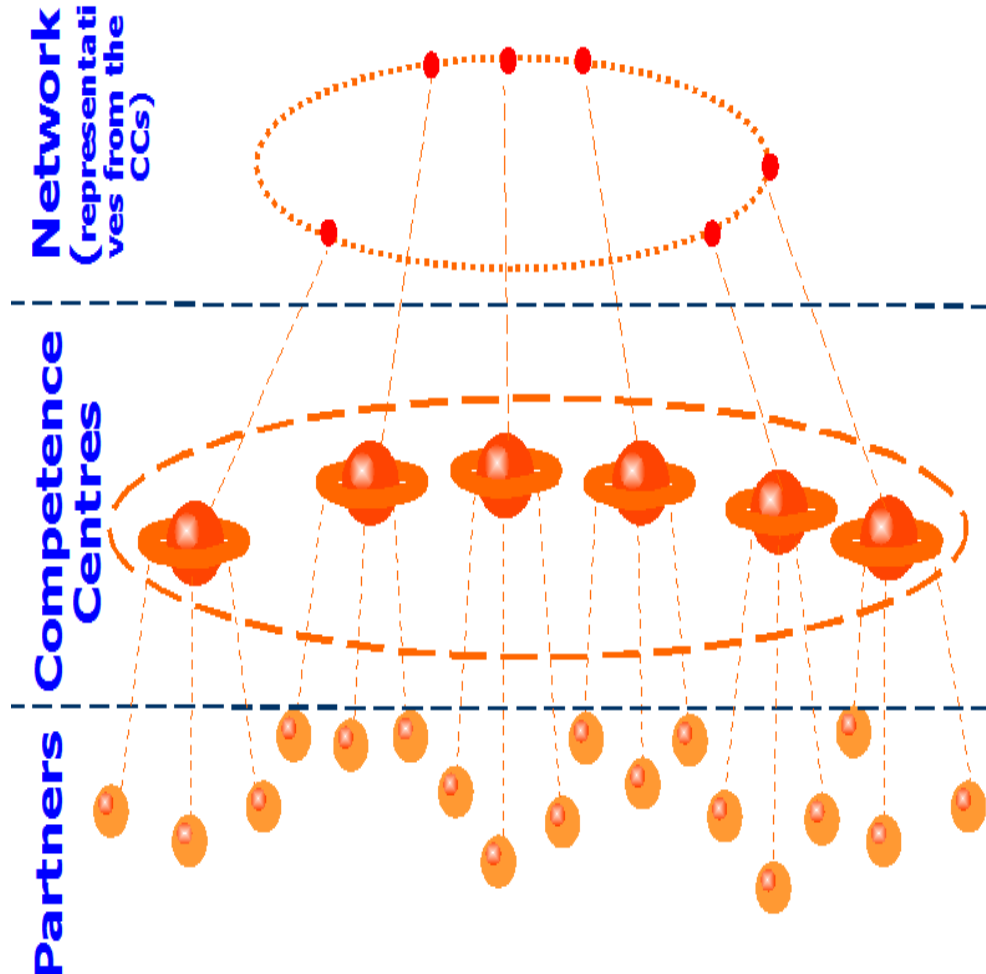Industrial practices keeping the freshness and enthusiasm of FLOSS tradition
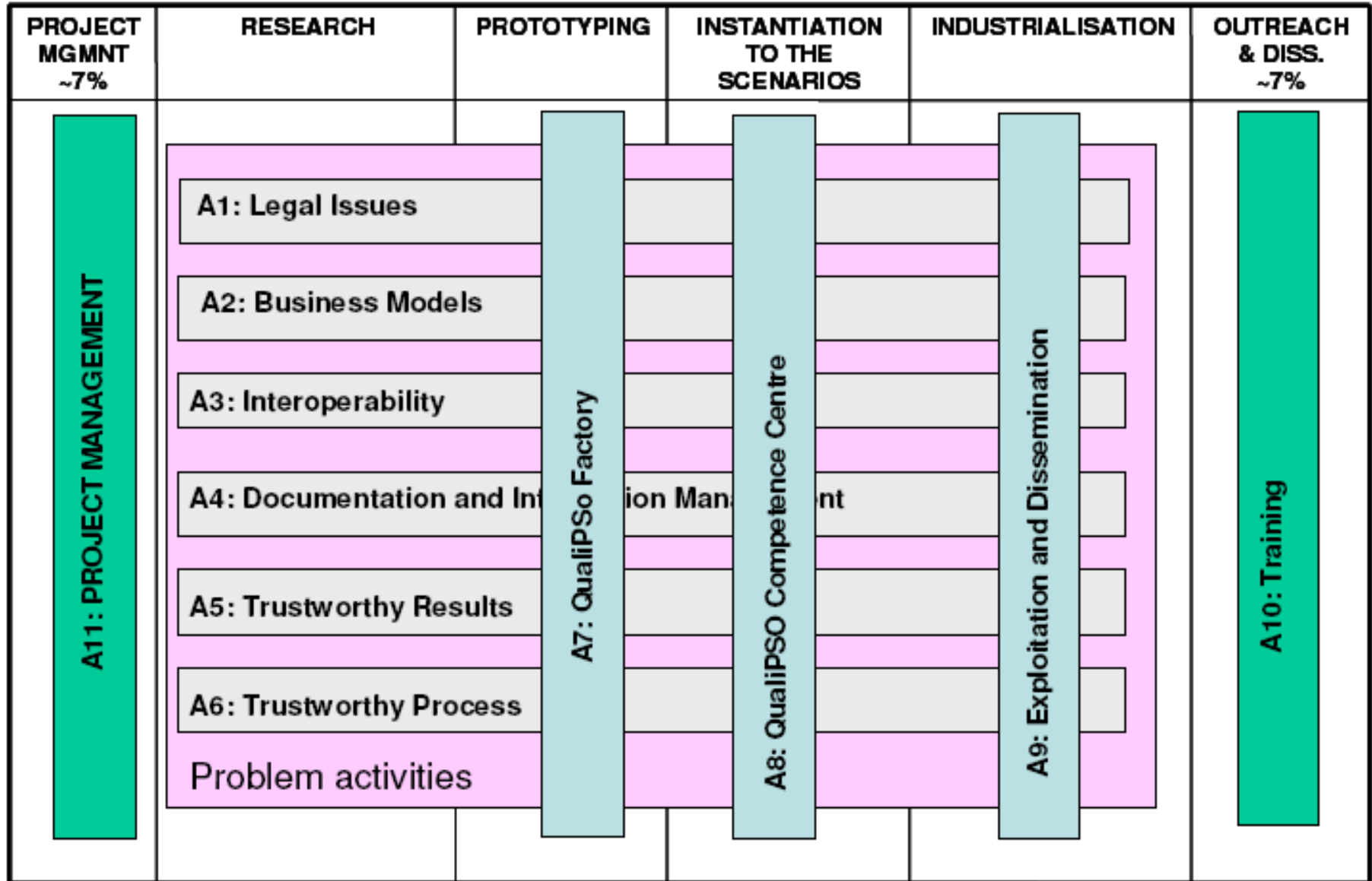
QualiPSo Competence Centers form a Network (federative model) sharing the same ethics, methods and tools

Act locally but cooperate globally

Provide expertise and a common set of services on a variety of topics related to quality

Each Competence Center has its own legal model and be self-sustainable

Qualipso Project Structure

PROJECT MGMNT ~7%	RESEARCH	PROTOTYPING	INSTANTIATION TO THE SCENARIOS	INDUSTRIALISATION	OUTREACH & DISS. ~7%

A11: PROJECT MANAGEMENT

A7: QualiPSo Factory

A8: QualiPSO Competence Centre

A9: Exploitation and Dissemination

A10: Training

- A1: Legal Issues
- A2: Business Models
- A3: Interoperability
- A4: Documentation and Information Management
- A5: Trustworthy Results
- A6: Trustworthy Process

Problem activities

The OMM –
an overview

Objectives:

Allow companies to use FLOSS to build their mainstream products and services

Main results:

Definition of the Open Maturity Model (OMM), a CMMI-like model for FLOSS to improve the trust in FLOSS software

- **Open Source Maturity Model** (OMM) is a CMMI-like model for *Free/Libre Open Source Software* (FLOSS)

  – It can be implemented in software organizations to enable FLOSS usage both in production and development of software products.

  – It is organized as an evolutionary model, inspired on CMMI, but...

  – **Focusing on FLOSS development characteristics**.

- OMM is a process model for development by developers, and integration of FLOSS components by integrators.

- OMM is intended for use by individuals and development teams spread that may be spread across locations worldwide.
    - Hence, the emphasis is on simplicity and ease of use.

- Being simple but organized as an evolutionary model, OMM can be just as useful for companies.
    - This approach helps keep the model lean but still practical.

- **OMM users**
  - FLOSS communities practitioners (developers, project managers, analysts, and testers).

FLOSS communities practitioners

can find guidance on what is required of them to conquer FLOSS integrators confidence.

can make their products more 'attractive' by knowing in advance how integrators might evaluate FLOSS products.

- **OMM users**

> **FLOSS system integrators**
> **can find guidance on what to look for when**
> **considering to integrate a FLOSS project to**
> **their solution or develop a new one.**

- FLOSS system integrators.

- **OMM users**

> OMM is appropriate for academic organizations and training centers on software development. As an open source model, it can serve as the basis for software engineering courses and courses in FLOSS development.

- FLOSS end users and instructors.

- **OMM structure**
  - It is divided in levels, each level building on and including the Trustworthy elements (TWE) at the lower level.

  - Trustworthy elements (TWE) are close related to FLOSS development dynamic and core CMMI practices.

- Trustworthy Elements (TWE) definition:

> **A specific component or aspect of a software product that influences the belief and trust of the stakeholders in the overall quality of the software product, through the assessment of its development process.**

- TWEs included in OMM are from two different sources:

    1) CMMI Process Areas

    2) FLOSS-TWEs gathered from the survey of QualiPSo work package 6.1.

- TWEs are grouped into levels.

    - **Basic level**

        - The TWEs at the basic level are essential for developing and delivering a trustworthy (high quality) FLOSS component.

    - **Intermediate level**

    - **Advanced level**

The OMM Pyramid: TWEs in OMM

PDOC – Product Documentation
STD – Standards
QTP – Quality of Testing Plan
LCS – Licenses
ENV – Technical Environment
DCFT – # Commits and Bug Reports
MST – Maintainability and stability
CM – Configuration Management
PP1 – Project Planning – Part 1
REQM – Requirements
REP – Reputation
RDMP – Roadmap
STK – Stakeholders
CONT – Contribution from SW companies
PPQA – Quality Assurance
PMC – Project Monitoring and Control
TST1 – Test - Part 1
DSN 1 – Design - Part 1
PP2 – Project Planing – Part 2
RASM – Assessment by Third Part
TST 2 – Test - Part 2
PI – Product Integration
RSKM Risk Management
DSN – Design – Part 2

Advanced Level

TST2, DSN2,
RSKM, PI

Intermediate Level

REP, RDMP
STK, RASM, CONT

PPQA,   PMC,
TST1, DSN1

Basic Level

CM, PP, REQM

PDOC, STD,   QTP,
LCS, ENV,   DFCT,
MST

Inside OMM
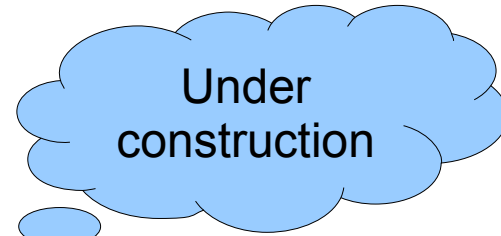
Structure of the OMM-Model

```
Level
```

```
TWE 1
  :
TWE n
```

```
Practice n .1
  :
Practice n .m
```

```
Relevant for      - Companies
                  - FLOSS communities
```

```
Metric 1          f(x)
  :
Metric nf(x)
```

Legend :

→ contains

▮ Constructing elements of the OMM
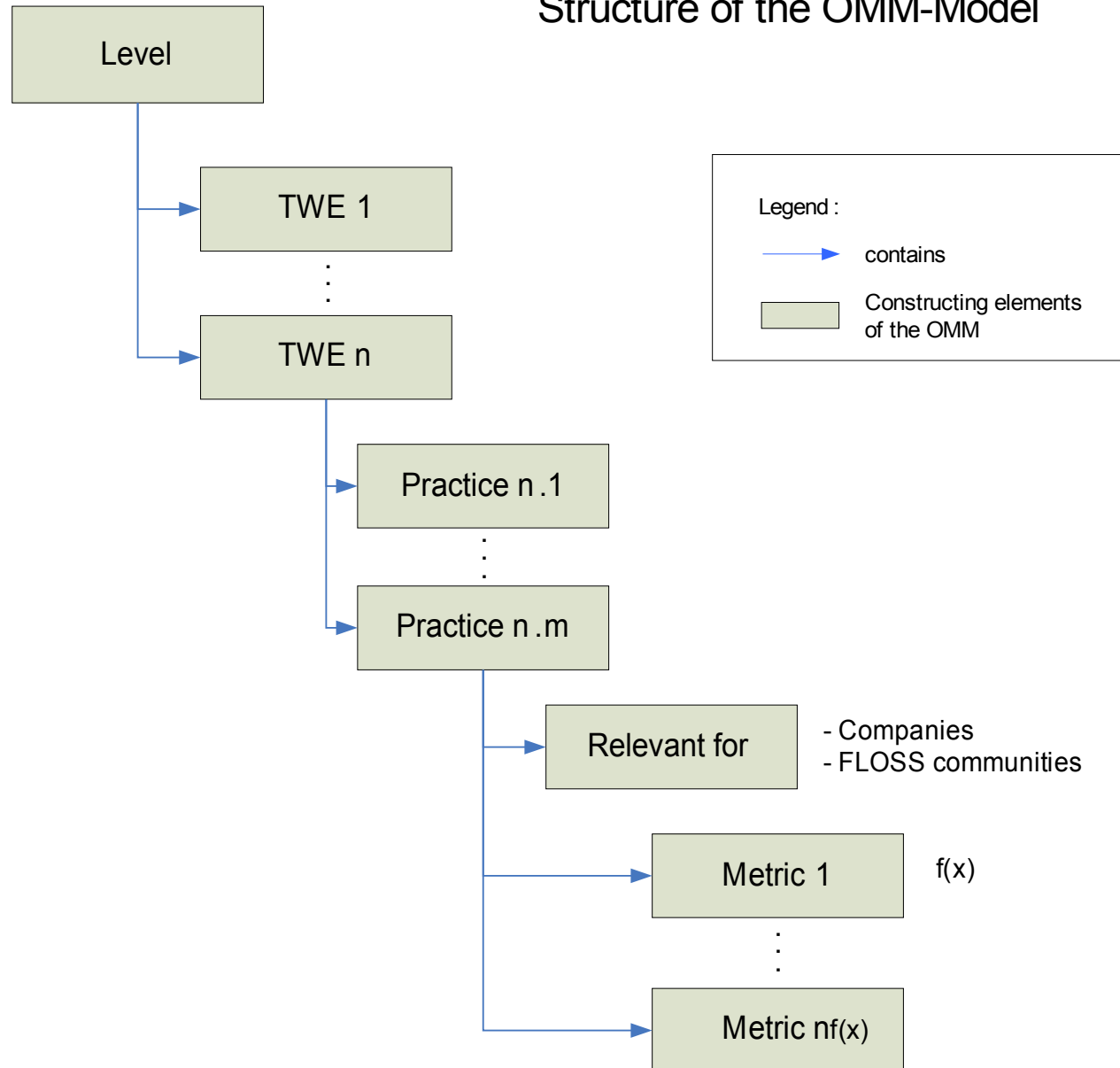
TWE	Practice		Relevant for	
			companies	FLOSS comm
TEX: Example of TWE	P1	Example of Practice 1	Mandatory	Recommended
	P2	Create user documentation	Mandatory	Mandatory
	P3	Create technical documentation (for troubleshooting)	Mandatory	Mandatory
	P4	Example of practice 4	Mandatory	Not important

Main idea: Provide high quality documentation and keep the documentation updated.

TWE	Practice		Relevant for	
			companies	FLOSS comm
PDOC: Product Documentation	**P1**	Document the product design / architecture (understandable)	Mandatory	Mandatory
	P2	Create user documentation	Mandatory	Mandatory
	P3	Create technical documentation (for troubleshooting)	Mandatory	Mandatory
	P4	Keep the documentation updated	Mandatory	Mandatory

Example:
Under construction

Basic Level

Main idea:

Use of Established and Widespread Standards.

Basic Level
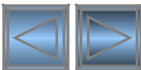
Main idea: Plan for testing.

e.g.:
• how tests will be carried out,
• tools to be used,
• test environment,
• testing responsibilities,
• how test results will be analyzed,
• defects corrected and open issues handled.

Basic Level

Main idea: Establish a technical environment.

Important factors influencing the trust:

• Tools,
• operating systems,
• programming languages and
• environments used by FLOSS communities

Basic Level
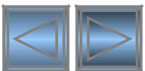
Main idea:

The number of commits and bug reports are indicators of FLOSS product popularity and indicate that the product is being actively developed and supported, and that further change requests and bug reports will be undertaken.

Basic Level
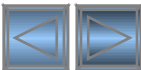
Main idea:

A potential integrator is more likely to view a FLOSS product favorably if it is proven to be maintainable and stable.

Maintainability means how easy it is to locate the elements to improve and how much work is demanded to change.

Stability means in wich degree things
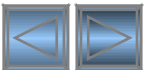
Main idea:
Establish baselines and release timely and frequently.

Focus:
• Create and release baselines
• Control configuration itens
• Track change requests

Inspired on CMMI Configuration Management process area.
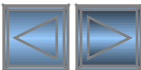
Main idea:

Establish project scope, life cycle, main milestones and needed resources

CMMI Project planning area was divided into two TWEs:
Project planning – part 1
Project planning – part 2

Basic Level
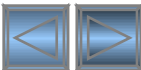
Main idea:

Identify and manage FLOSS product requirements clearly. Obtain commitments to requirements.

This TWE is inspired in CMMI Requirements process area

Basic Level
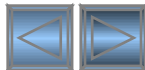
Main idea: The more popular the software product is the more likely people will trust on it.

Such popularity can be indicated by, for instance, the number of users that have downloaded the product and that are using it.

Discussions in mailing lists, forums, bug reporting systems and other communication environments are also relevant to indicate the popularity of a FLOSS product.

Intermediate Level

Main idea: Define and evolve a product roadmap. This may clearly state product objetives and directions.

- Important aspects: responsibility for the roadmap is defined, roadmap includes plans for at least the next 2 versions, and roadmap is regularly updated.

- It provides an insight not only in the development process followed in the past but it also describes the improvements that are planned for the near future.

- It must be detailed enough.

- It has to be respected in order to ascertain a high quality level of the development process.

Intermediate Level

Main idea: It is important to know if there is good collaboration within the groups and how they communicate

• Plan stakeholders' participation in advance (to ensure availability)

• Encourage Stakeholders to participate in the meetings where they are required

• Monitor Stakeholder Involvement

Intermediate Level
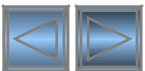
Main idea:

For a potential integrator, participation of reputed software or IT companies in the FLOSS development may be a positive indication of the FLOSS product.

It is important to encourage contribution to FLOSS product from SW companies

Intermediate Level
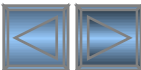
Main idea:

Objectively evaluate the quality of the FLOSS process and product.

This TWE is inspired on CMMI PPQA process area and is mandatory only for FLOSS integrators, not for FLOSS communities

Intermediate Level
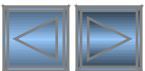
Main idea:

Monitor project progress, commitments and milestones

This TWE is inspired on CMMI PMC process area and it is mandatory only for FLOSS integrators, not for FLOSS communities
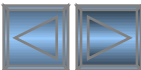
Intermediate Level
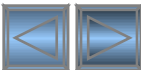
Main idea:

Conduct verifications to the product

Focus:
Peer Reviews
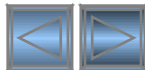
This TWE is inspired on CMMI Verification process area

Intermediate Level

Main idea:

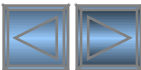Build the product or product components from high level design
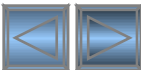
Focus:
Architecture

Main idea:

Having a more mature project planning:

- data management
- reconcile works and resources levels
- Obtain plan commitment

Main idea:

Assessment of the product by 3rd party companies may count in favor of the product, when potential integrators evaluate FLOSS products for use in their own development .

Advanced Level

Main idea:

- Determine Integration Sequence
- Establish the Product Integration Environment
- Manage Interfaces
- Confirm Readiness of Product Components for Integration
- Assemble Product Components
- Package and Deliver the Product or Product Component
    .
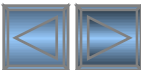
Main idea:

Incorporate advanced design practices such as:

• Design Interfaces Using Criteria
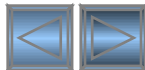• Develop Alternative Solutions and Selection Criteria
•

Advanced Level
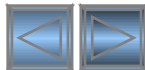
Main idea:

Conduct validations to the product

Focus:
Validation results

This TWE is inspired on CMMI Validation process area

Advanced Level

Main idea:

Incorporate risk management practices such as:

- Determine Risk Sources and Categories
- Define Risk Parameters
- Establish a Risk Management Strategy
- Evaluate, Categorize, and Prioritize Risks
- Develop Risk Mitigation Plans
- Implement Risk Mitigation Plans

This TWE is inspired in CMMI RSKM process area

Advanced Level
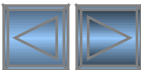
- A6 team described the first ideas on which process related metrics could be of importance for OMM.

- At this stage, this is only a collection of goals, questions and metrics.

- Goal, question, metric (GQM) was used.

- A complete list of GQM for integrators can be found in WD 6.3.1V1.0.pdf. We present following only an example.

| GOAL 1	Providing high quality documentation (PDOC)
QUESTIONS	• Is the level of documentation appropriate to classic software development? • Does the documentation provided take in consideration specific FLOSS criteria?
METRIC	• Automatic full text indexing of software documentation; developers' and eventually users' check-list of software documentation available • Same measurement approach just for specific FLOSS documentation

OMM in Processes of Companies Integrating FLOSS

- One of the objectives of this process model is also to facilitate the selection, use and further processing of FLOSS products for integration into their own products.

1- Corporate level policy / management decision to include FLOSS in the company's products;

2- Evaluation and selection of FLOSS products based on TWE

3- Appoint a suitably qualified person or a team for the evaluation and selection (henceforth called the selection team).

4- Document the requirements / functionality to be fulfilled by the proposed FLOSS component.

Not all TWE can be directly mapped to a specific CMMI process area. Particularly:

1. Resources required: resources for searching, selection, testing and integration of FLOSS components into the project.

2. Responsibility for all issues related to FLOSS, including defect tracking – how it has to be done, who does it.

3. License and other legal issues should be addressed.

- **Open Source Maturity Model** (OMM) is a CMMI-like model for *FLOSS*

- OMM brings emphasis on **effectiveness** and **ease of use** for the benefit of FLOSS communities and FLOSS integrators.

- The model is built based on **trustworthy elements** considered necessary by the industry members to make the resulting product trustworthy.

- These trustworthy elements were gathered based on surveys of several European companies.
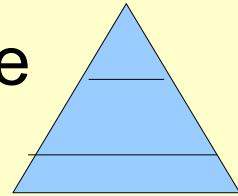
Qualipso Project

www.qualipso.org

www.icmc.usp.br/qualipso (in Portuguese)

OMM

WD6 3 1V1 (already available at www.qualipso.org)

WD6 3 1V2 (by the end of June/2009)

www.icmc.usp.br/~viviane/OMM (not formal)

TWE survey

Deliverable A6.D2.6.2 - Trustworthy elements identified in OS processes

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viviane at icmc.usp.br

VISIT AND CONTACT QUALIPSO PROJECT!
www.qualipso.org

Project Acronym: QualiPSo

Project Title: Quality Platform for Open Source Software

Project instrument: Integrated Project

Contract Number: 034763

Consortium: 18 organisations from 9 countries (3 continents)

Thematic area: Open development Platforms for software and services

Duration: 48 months (important results from every year)

Budget: 17.3 MEuro (Funding 10.4 MEuro)