Supporting Time Planning Aligned with CMMI-DEV and PMBOK

GQS – Software Quality Group
INCoD - *The National Institute of Science and Technology for Digital Convergence*

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Introduction

Software development projects still have problems to be delivered on time and budget.

One of the main problems is the lack of project management.

Best practice models such as CMMI and PMBOK are used to improve this situation.

Yet, a large part of the market is composed of SMEs.

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Objective

Support for time planning in SMEs aligned with PMBOK and CMMI:
- Generic process model
- Enhancement of open-source tool

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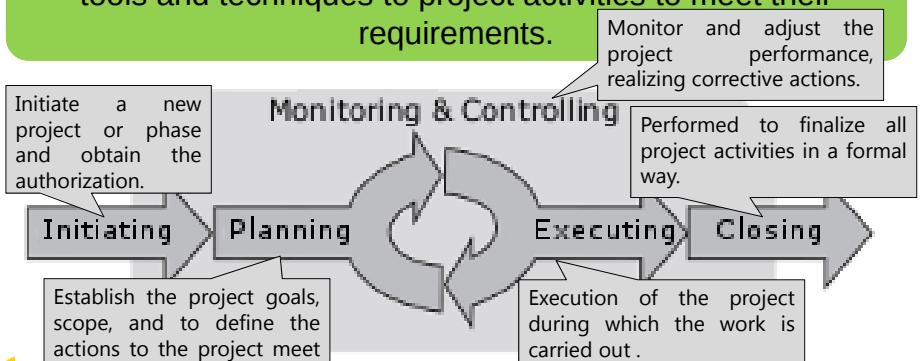
PMBOK

A project is a temporary endeavor undertaken to create a unique product, service, or result.

Project management is the application of knowledge, skills, tools and techniques to project activities to meet their requirements.



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PMBOK – Time Planning

According to PMBOK, time planning requires processes to:

Process	
6.1	Define Activities.
6.2	Sequence activities.
6.3	Estimate activities resources.
6.4	Estimate duration of activities.
6.5	Develop schedule.

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CMMI-DEV

The Capability Maturity Model Integration (CMMI) provides a framework for the improvement of the development process for software products and services.

Time planning specific practices recommend by CMMI-DEV:

Practice	Description
PP/SP 1.1	Estimate the Scope of the Project.
PP/SP 1.2	Establish Estimates of Work Product and Task Attributes.
PP/SP 2.1	Establish the Budget and Schedule.
PP/SP 2.4	Plan for Project Resources.
PP/SP 1.4	Determine Estimates of Effort and Cost.

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Unified Best Practices

UBP	PMBOK 4ed:2008	CMMI-DEV v1.3:2010
P1	Define Activities	PP/SP 1.1 Estimate the Scope of the Project
P2	Establish Estimates of Work Product and Activity Attributes	PP/SP 1.2 Establish Estimates of Work Product and Task
P3	Sequence Activities	PP/SP 2.1 Establish the Budget and Schedule
P4	Plan for Project Resources	PP/SP 2.4 Plan for Project Resources
P5	Estimate duration of activities.	PP/SP 2.1 Establish the Budget and Schedule
P6	Estimate Effort	PP/SP 1.4 Determine Estimates of Effort and Cost
P7	Develop Schedule	PP/SP 2.1 Establish the Budget and Schedule

Based on: WANGENHEIM, Christiane et al. **Best practice fusion of CMMI-DEV v1.2 (PP, PMC, SAM) and PMBOK 2008**. Elsevier, n. 52, p.749-757, 2010.

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Generic process model

We harmonized CMMI-DEV and PMBOK processes/practices for time planning.

Focused on techniques applied in SMEs context.

Developed the generic process model for time planning.

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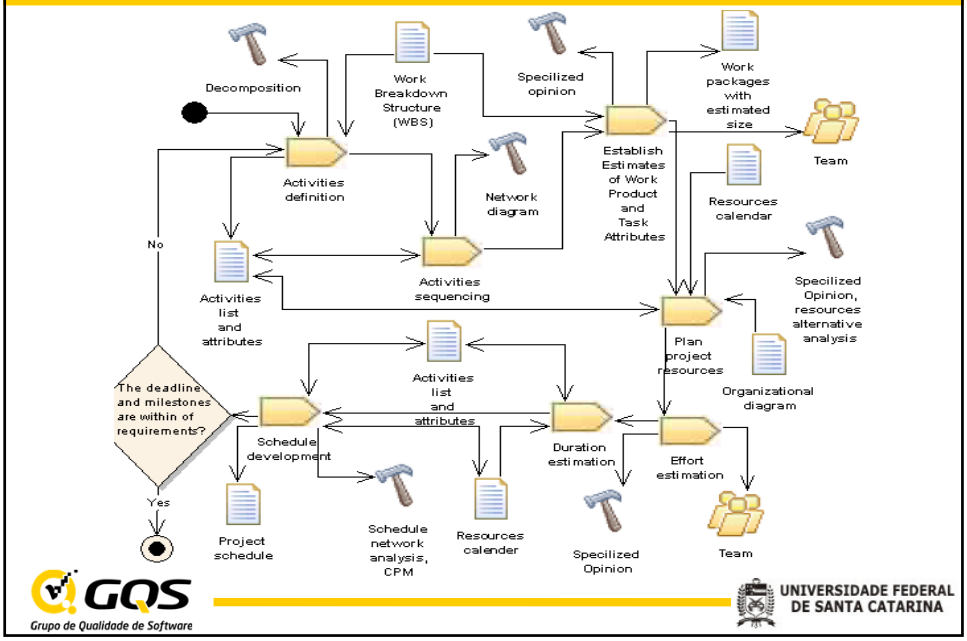
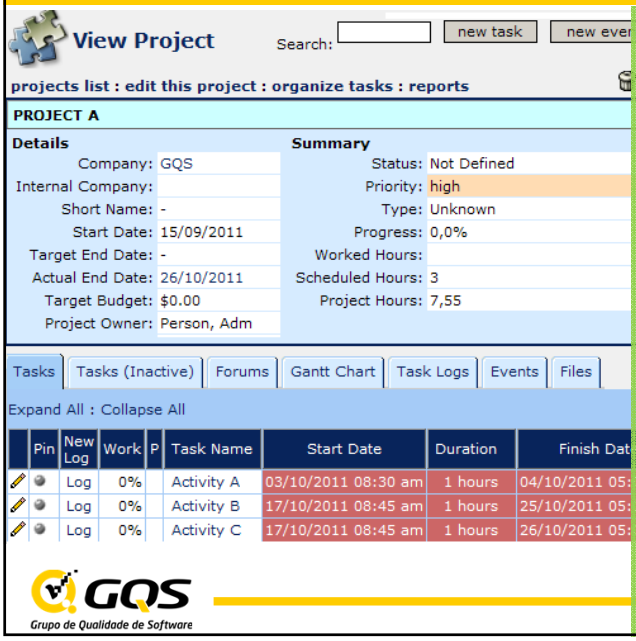
Generic process model for time planning



Tool support - dotProject



Web application for project management

- User management.
- Internationalization
- Register projects
- Register activities
- Contacts list
- File repository.
- Schedule (Gantt chart)

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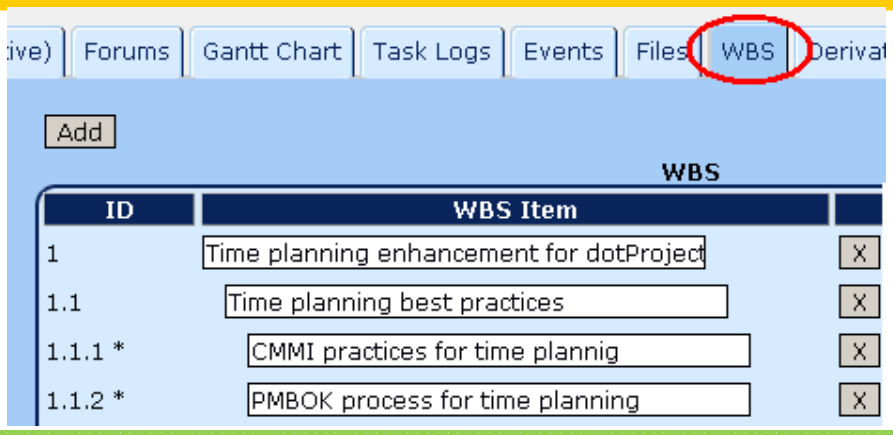
Evolution of tool support - 1



- Support to define project WBS.
- Management of WBS items.
- Highlighting of WBS work packages

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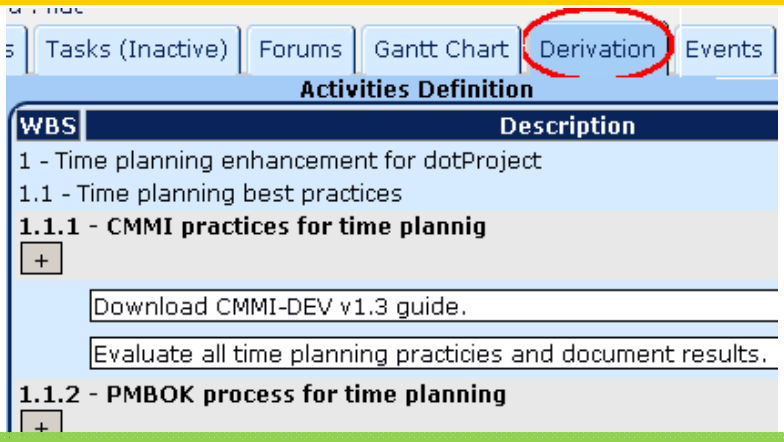
Evolution of tool support - 2



- Support of the derivation technique.
- Definition of project activities.

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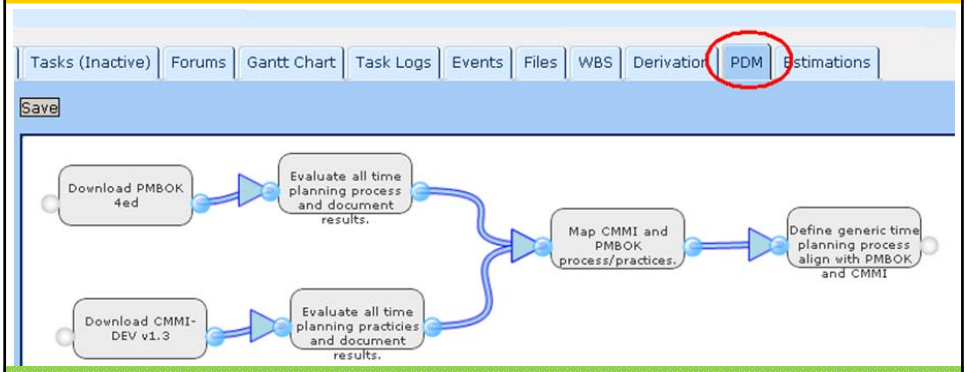
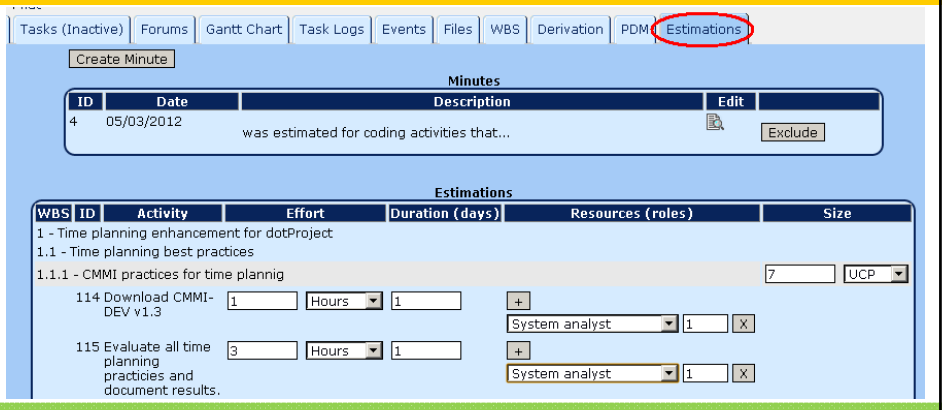
Evolution of tool support - 3



- Precedence diagram method.
- Support of the logical sequence of activities.

Evolution of tool support - 4



- Estimation of resources
- Estimation of duration
- Estimation of effort.
- Estimation of size.
- Register of estimation minutes
- Schedule development.

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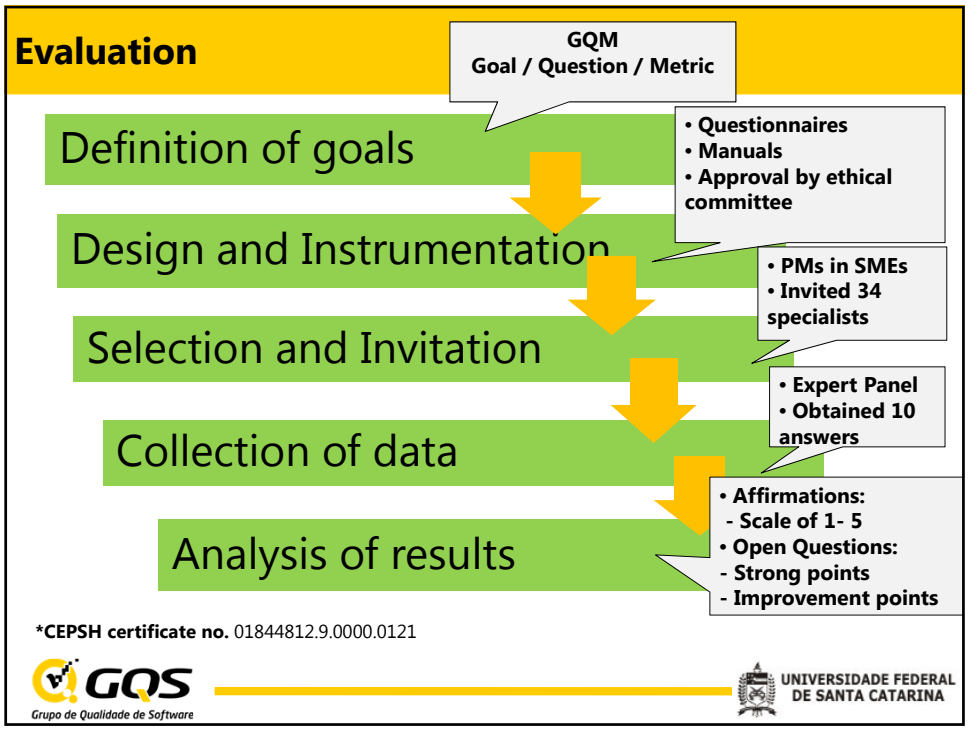

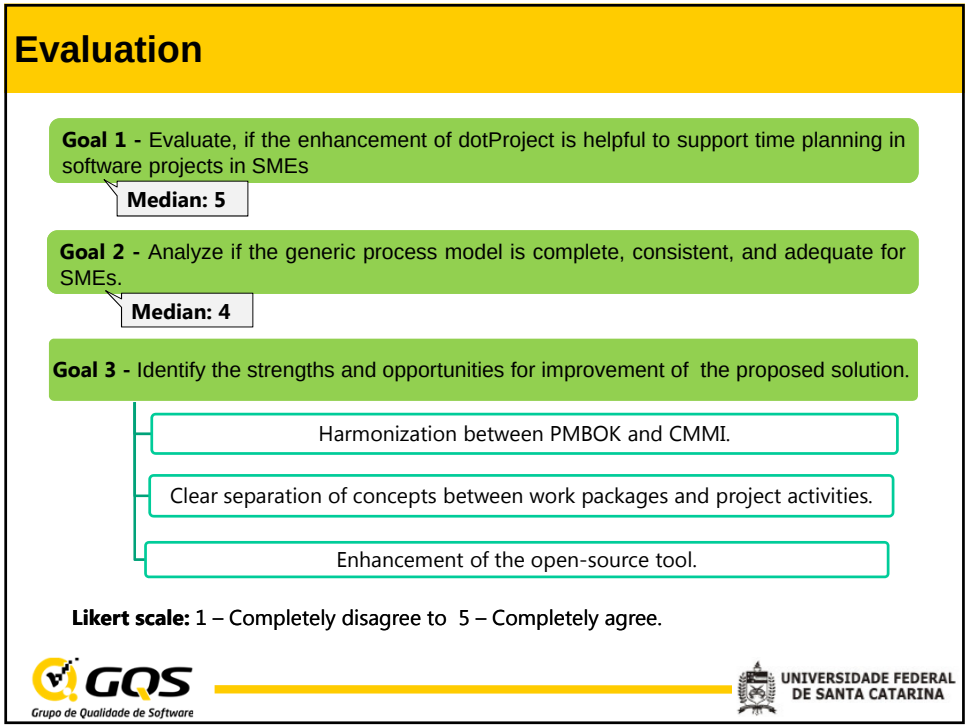

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Evaluation

Goal 4 - Compare the degree of alignment of the enhancements of dotProject with dotProject v2.1.6.

UBP	dotProject v2.1.6	dotProject enhanced version
P01. Define Activities	**	***
P02. Establish Estimates of Work Product and Activity Attributes	*	***
P03. Sequence Activities	**	***
P04. Plan for Project Resources	**	***
P05. Estimate Activity Durations	**	***
P06. Estimate Effort	*	***
P07. Develop Schedule	***	***

\- Does not provide any support.
* Offers basic support, covering less than half of the UBP.
** Covers more than half of the UBP.
*** Offers a complete set of elaborate functionalities for this UBP.

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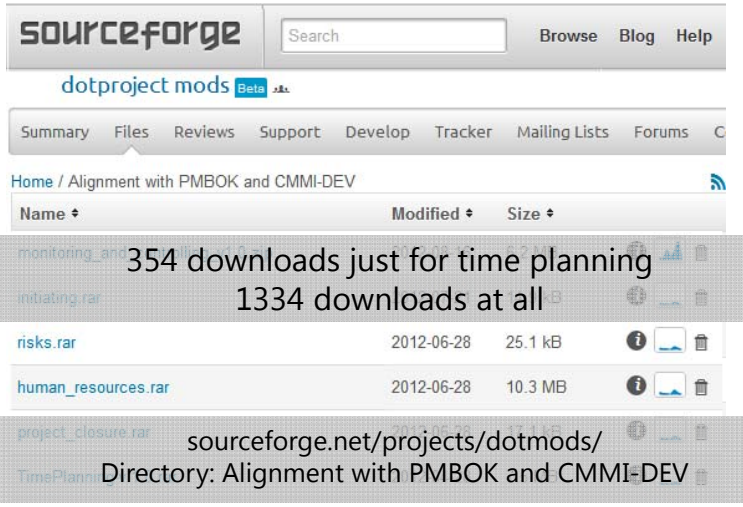
The results are useful?

The enhanced tool is available in the official dotProject repository:



354 downloads just for time planning
1334 downloads at all

sourceforge.net/projects/dotmods/
Directory: Alignment with PMBOK and CMMI-DEV

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Conclusions

- Support developed for time planning in SMEs aligned with PMBOK and CMMI-DEV has been indicated as useful:
  - generic process model
  - Evolution of dotProject
- Contributing to the improvement of time planning in SMEs increasing their competitiveness.

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Future work

- Improve the integration between dotProject modules developed by GQS.
- Analyze and improve the tool usability.
- Enhance new versions of the tool based on users community feedback – http://www.gqs.ufsc.br/evolution-of-dotproject/

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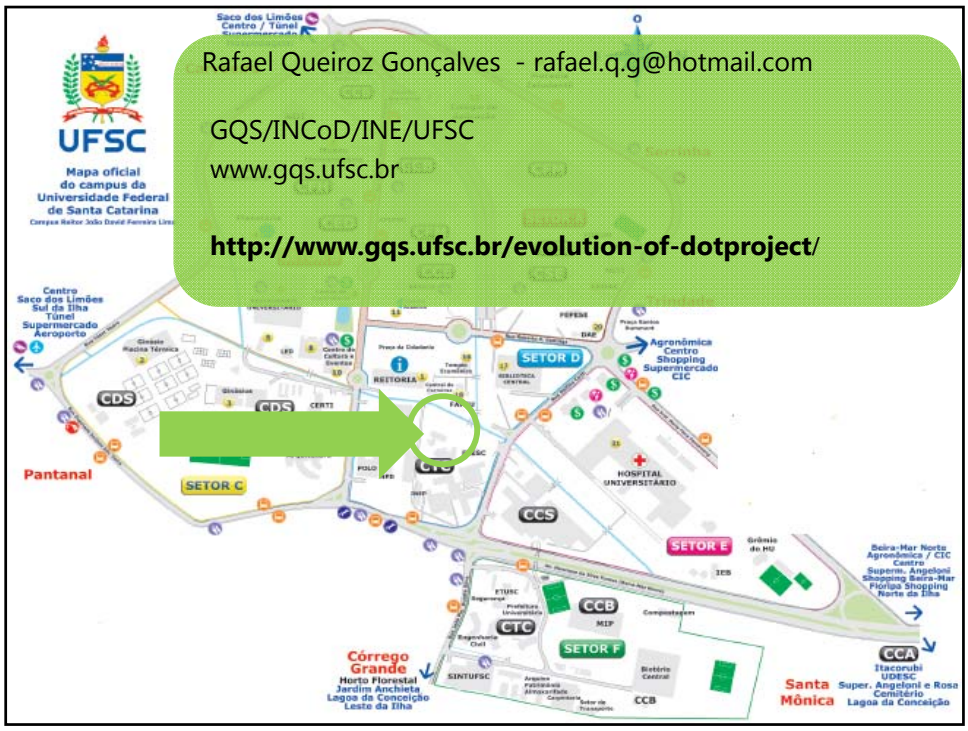

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