

Integration of a software process management model with project management tools

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Abstract: - Processes for software development and computer tools for project management make a couple that is good to keep together. By one side, a project management tool loses great part of sense and becomes no useful if it doesn't come with a methodology that clearly explains to everyone involved in the project what to do and when, through the project life-cycle. By the other side, a methodology or a process for software development stands in something too fuzzy if it doesn't come with any tool or a group of them that provide a physical environment where the methodology steps can be executed. This paper presents a proposal, a methodology for software project management coming together with a support system based on Microsoft tools, Project Server and SharePoint, attaching importance to methodology and tools integration.

Key-Words: - professional profile, project management, software development process, quality, collaboration and planning tools, ISO 10.006

1 Introduction

One of the most important factors to obtain an adequate quality in computer science projects is to use a methodology, so the whole of project management process is normalised (CMM, ISO15504, etc.). But almost as important as this, is that project management methodology must be supported by project management software tools that allow to put in practice that norms. Fortunately, both components, methodologies and tools, exist and are available for everyone. Nowadays, you can choose between various software development process management models and is easy to find a lot of different tools for project management. However, any link between them frequently misses, and what is required by organizational project management processes and the tool operative does not correspond one each other, creating holes that translates into a very low grade of implantation of the project management system, going against the interests of quality. In this paper is showed an example of integration between a generic project management methodology and a universally used and accepted tool like Microsoft Project.

2 A proposal for project management methodology

Although nowadays exist multiple software

development management models (CMM, ISO15504, etc.), most of them are not directly applicable to an organization, because it is necessary to modify them and adequate to its operative and particular objectives. This paper is based on the project management methodology developed for Information Systems Headquarters of Asturias Government. This methodology, developed by the Software Project Development Area of the same organization, in collaboration with the Project Engineering Area of University of Oviedo, shapes a project management global system starting from norm ISO10006 recommendations, complemented in some aspects with other ones took out from IPMA (Internacional Project Management Association) and PMI (Project Management Institute) bodies of knowledge. ISO 10006 norm, "Quality Management – Project Management Quality Guides" [2], is a guide for practices, concepts and quality element that are important to get quality in project management. ISO 10006 covers all basic aspects for integral project management: scope, deadline, cost, quality, risk, personnel, etc. It is applicable to any kind of project independently of its nature, size or complexity. Because the norm is quite general and there are aspects not to much concrete, it is necessary to have a look to the set of standards made by the two organizations that control the project management aspects all over the world: IPMA and PMI [3][4]. Having as a base the elements described in the ISO

10006 norm, the PMI Body of Knowledge for Project Management [3][4], Métrica 3 guides [5] and the methodology not absolutely documented of Asturias Government Development Area, a new methodology was elaborated and written down in three documents or guides:

- Methodological Guide for computer science project management of Asturias Government.
- Auxiliar Techniques Guide for computer science project development of Asturias Government.
- Auditing Guide for project management system.

In a global way, it is possible to cover all the aspects required by a quality methodology, but limiting the information in the way that it will be assumed by future users, understandable and easy to keep. It is possible to have a look to a more detailed description of the methodology in [6][7].

In according to computer science terminology, each step in which the project is divided is named Processes, necessary for its execution, dividing the develop of each process in tasks or activities. Because of the great implantation and general knowledge about the methodologies or development metrics and, specifically Métrica, these phases are not included. They will follow the model directly, adapted for Asturias Government by "Methodological Guide for Developing".

In according to this, Processes are then identified, with their corresponding activities, showed in Figure 1. The guide defines for each process, its objectives, participants, information diagram, activities and related documents.

Inside this methodology, various participant user figures have been identified. Roles are:

- Coordinator: A general coordinator for the whole system is identified, as well as another one for each Service inside the Information Systems Headquarters.
- Project Manager: The Project Manager has the maximum responsibility in the project and has to take the higher level decisions.
- Committee Member (management, monitoring, etc.): Members of these committees will access periodically to the system to obtain some information related to their projects.
- Project Master: The Project Master exerts the technical project management.
- Project Team Member.
- External Users.

3 The new environment for project management based on Microsoft Project Server and SharePoint

Traditional project management tools [1] (Microsoft Project, CA SuperProject, Primavera SureTrack, MicroPlanner, etc.) are useful in traditional single-user environment. They are really tools that the Project Master has installed to make the planning, but they can't communicate the plans to the rest of the team or to the stakeholders (people affected by the project), and they can't to recollect information about the progress of the project in a collaborative environment where different users play. In addition to this, they are an overload for the Project Master who must update the information on his own, and they are not useful to inform the team about the project status.

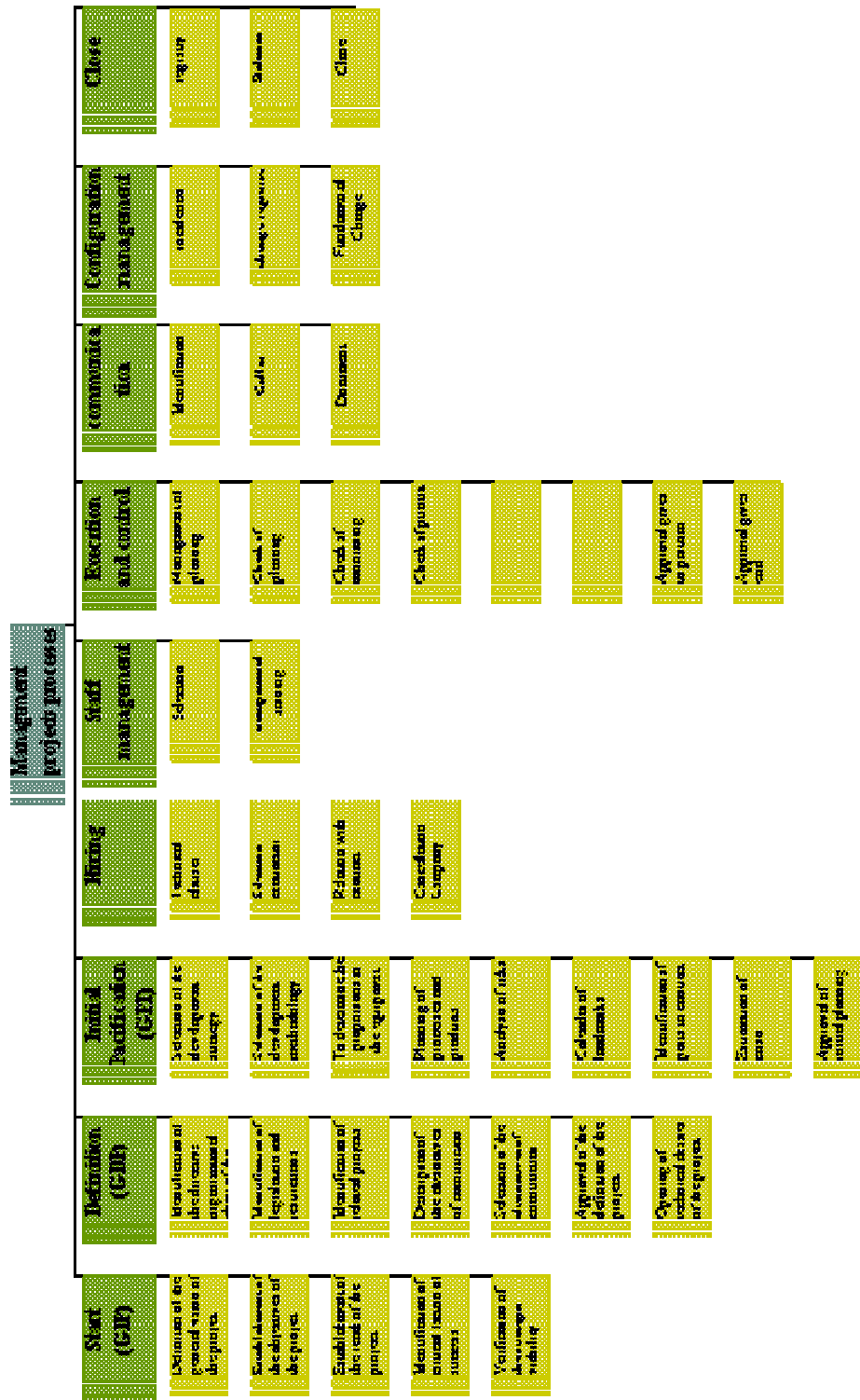
However, the aspect required in these days for a management tool are:

- Ability for managing task, relations, resources, costs and programmed deadlines for project execution and monitoring reports derived by itself.
- Project monitoring.
- Distributed and remote project management.
- Information access control.

Modern project management tools evolve in this way, migrating to tools called Web based management tools, integrated with group collaborative tools. This is the case of Microsoft Project, the standard for this market, in the last versions. The Microsoft Project Management System is composed by two integrated main modules, the one shaped by the software *Microsoft SharePoint Windows Services*, oriented to group collaboration and document management, and *Microsoft Project Server 2003*, oriented to planning and project control.

The system makes easy collaboration and project information communication allowing the Project Managers, Team Members and other "stakeholders" to see and update project planning and tasks trough a web browser.

Tools users have an account that must use for validate themselves. They exist several user profiles, having different privileges depending on the user level. So, only project managers have access to some information, as can be the economical one, while other users only are allowed to access to determine information. It is possible to create or delegate tasks in the tool, make worker time-tables, show project reports, make and ask for status reports, analyse resources utilization, etc. Communication between users is done through message-interchange, being



possible to integrate them with e-mail tools as Outlook.

4 Integrated System Model

Projects are created by Project Masters using Microsoft Project Professional. Resources assigned to tasks can be corresponded to system users, allowing them access the project information through web interface. Users receive notifications by e-mail letting them know the new planning changes.

Project monitoring is done in a distributed way. The common way to do this is that team members, periodically, have to compliment progress reports about tasks they are working for. These reports are automated and are available in digital version, so users have access to them from their web browsers. Project Planning is updated automatically with this information. From web interface, users can access to different project views (Gantt diagrams, monitoring reports, costs, resources allocation, etc.).

Project Server is an integrator environment too, where you can see the information of any project. A project manager has access to the portfolio with the information of all projects he is managing (Figure 2). Project team members find information about all tasks they are working for, independently the project that tasks belong.

Each time a project is created, a site or subweb site based on SharePoint is created as well, posted to group collaboration (Figure 3). This site contains document libraries for the project (specifications, code, monitoring reports, etc.), Announcement lists, contacts, discussion forums, check lists, etc. These sites are created based on a site template designed in according to the methodology. So, each new project has automatically created the standard structure needed to store documentation, lists for configuration management, check lists that each Project Master has to fill on each project phase or milestone, etc. The access to subwebs is done through a project management general portal (Figure 4), that contains general information project development for the whole organization. So, all processes and methods identified by methodology are described in the portal pages.



Fig. 2 Portal of a SharePoint-based project



Fig. 3 General Portal

Portal that contains these sites is jerarquically organized, finding a main page with general information of all projects (announcements, documents, forums) in first place. In that page exist a list with links to the project-specific portals. It is important that the use of these tools does not become in something complex and difficult for users. It is necessary that project management methodology clearly identify the tasks that each participant has to do at any time in the project life. Obviously, keeping away from these tasks related directly to used project management tools, another tasks related to development process take place, as well as their corresponding responsibilities. Tables 1, 2 and 3 show some examples with proposed tasks for two of the processes showed in figure 1. Because of space reasons, they are only showed tasks related to the Coordinator and the Project Master.

Table 1 Tasks/resp. relation for the project beginning process

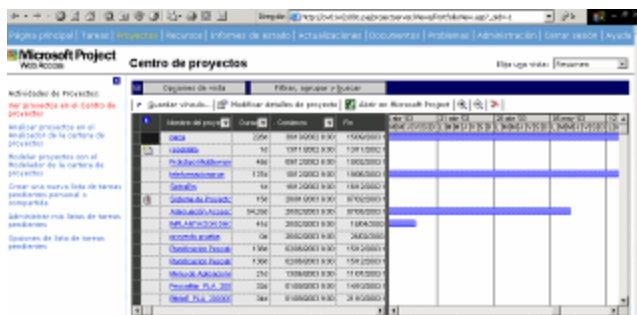


Fig. 1 View of projects portfolio from Project Web Access

Process	Task (Responsible)
Project beginning process (GIP)	<ul style="list-style-type: none"> • Creation of subweb for project, asked for by the project manager. This subweb will be based on the general template (Coordinator) • Configure the project manager as a user (Coordinator) • Add as users the team members that collaborate in documents redaction of this process (Coordinator) • Add the project to the project list. Configure Project Start as actual status for project. Let show information about Title, Department, affected units, Project manager, Abstract, estimated date for beginning, link to the project web page (Coordinator) • Maintenance of documents generated in this process (Coordinator)

Table 2 Tasks/resp. relation for project definition process

Process	Task (Responsible)
Project definition process (GDP)	<ul style="list-style-type: none"> • Add the Project Master as a user (Coordinator) • Add the management committee members as users (Coordinator) • Add the monitoring committee members as users (Coordinator) • Add the project quality team members as users (Coordinator) • Add the project technical team members as users. (Project Master) • Configure Project Definition as Project Status in the project list and fill the gap “Real beginning date” with the date where this process starts. (Project Master) • Check documents that belong to Technical Project Dossier. (Project Master) • Maintenance of documents generated in this process (Project Master) • Fill the quality questions about this project step (Project Master)

Tabla 3 Tasks/resp. relation for Initial Planning Process

Process	Task (Responsible)
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Initial Planning process (GIP)	<ul style="list-style-type: none"> • Creation of initial project planning with Microsoft Project Professional and publish it in Project Server (Project Master) • Maintenance of documents generated in this process (Project Master) • Configure “Initial Planning” as actual status in the project list. Fill the gaps referencing Estimated date for technical execution start, estimated date for ending and execution time (Project Master) • Fill the quality questions about this project step (Project Master)
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Inside the proposed model does not exist a formal project master until the project overcomes the project beginning step. At this moment, if the project is viable then it is approved and a project master is assigned. In this organization, the figure of Project Manager has an administrative meaning, more than technical one, and usually is held by a high level state-worker coming from source Department which asked for the project. In this step is the coordinator who creates the site for the project, assign privileges to users, add the project in the project list and maintain the documents generated at this process. In the Project Definition process, the Coordinator gives the technical control of the site and of management tool to recently assigned Project Master.

Processes are described in Methodology Reference Guide. For each process are identified its participants, the process information diagram and the process activities. Templates for documents to elaborate are showed too, being available the normalised version of these templates on the server. To improve quality, at each process end, some reports must be answered to validate the sep. This reports are permanently updated on the portal.

Each one of the identified processes has some tasks and some techniques to use by each participant. There is a matrix where are indicated the techniques that must be used by each user at each moment. Techniques and tasks to do with the management tool are described from an operational point of view in two additional documents, the techniques guide and the how-to-use the tool one.

Because everyone must know what to do at any time, is recommendable to include this information inside the project management portal in a list form. Tasks

search must be allowed by process or by participant profile. This list is linked to the user manual where each activity is described in detail.

5. Conclusions

For a successful software development management process in any organization, is necessary to adapt it to the characteristics and concrete objectives of the organization, as well as give the corresponding support tools. Lot of times, implantation of a methodology of this kind in any organization fails because the methodology only covers **what** to do, forgetting **who**, **how** and **when**.

Taking as a starting point any of the international standards for project management and development processes it is possible to adapt them for a particular organization. That transformation should include a guide or reference that describes the methodology processes, complementing it with another guide referencing technical aspects, tools, etc., in the same way that do Procedures Guide and Technical Instructions elaborated for ISO 9000.

Participant roles must be clearly identified, and must exist a task list to do by each participant at any project situation, development process tasks as well as management tool tasks. By last, another weak point of today project management tools is their short connection to design, development and code version control tools. A major integration between all of them is wished in the future.

References

- [1] ISO 10006. Guía de gestión de calidad. Calidad en Gestión de Proyectos.
- [2] PMI. Project Management Body of Knowledge.
- [3] AEIPRO. Fundamentos de la Dirección de Proyectos. Zaragoza, 1998.
- [4] MAP. Guías Metodológicas de Desarrollo de Proyectos Informáticos. Métrica 3.
- [5] V. Rodríguez; N. Roqueñí; E. Vergara; J.M. Mesa; Análisis comparativo de herramientas informáticas comerciales para la planificación de proyectos de ingeniería. V Congreso Internacional de Ingeniería de Proyectos, Lleida, Octubre 2000.
- [6] R. Concepción; F. Ortega; V. Rodríguez; J. Villanueva; Desarrollo de una metodología para la gestión de proyectos informáticos según ISO10006 en las A.A.P.P. VII Jornadas sobre Innovación y Calidad del Software. Palma de Mallorca, Julio 2002.
- [7] Rodríguez, V.; Ortega, F.; Concepción, R.; Menéndez, C.; Administración Electrónica del desarrollo de proyectos software mediante técnicas avanzadas. Tecnimap'02. La Coruña, 2002.