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## OO/UC3M/66- PIBOK-PB: A COLLABORATIVE FRAMEWORK TO IMPROVE SOFTWARE DEVELOPMENT PRODUCTIVITY THROUGH PROJECTS AND PROCESS ASSETS REUSE AND MEASUREMENT WITH SIX SIGMA TECHNIQUES.

The *Software Engineering Lab* (SEL-UC3M) is aimed to develop solutions to software projects processes related problems having an accessible, collaborative, practiced and manageable focus. We are interested to collaborate with research centers and universities worldwide that share our philosophy as well as with enterprises and public administrations interested in our novel methods.

### Description and special features

This collaborative framework will allow project and process assets reuse during the software development lifecycle through the use of product patterns. These patterns will offer to the software development team the knowledge of the software engineering best practices as well as a mechanism to take advantage of the organization's know-how across multiple projects. Additionally, this collaborative framework will ease quality parameters gathering and measurement, thanks to the incorporation of six sigma techniques that also will empower decision making and corrective/preventive actions management in future projects.

The proposed framework offers the following features:

- Models and software process techniques taken from the software engineering best practices.
- Customization of the existing software process models and methodologies in order to satisfy organization's projects specific requirements.
- Capability to elicitate organizations process and to create specific process models for any organization.
- Capability to elicitate and store knowledge from software process models into product patterns.
- A search engine to ease localization and reuse of process assets in projects.
- A collaborative environment for projects execution where project team members will have:
  - A project execution electronic guide with the following features:
    - A Gantt diagram for project planning and tracking.
    - A list of project activities organized by project roles.
    - A project activities workflow.
  - A process electronic guide for each project activity, this guide will offer to each project role all the necessary information to perform an activity:
    - Necessary entries to accomplish an activity.
    - Necessary steps to perform an activity.
    - Exit products to obtain at the end of an activity.
    - Lessons learned after activity completion using a product pattern.
    - A list of project roles that interact while an activity is performed.
    - A template for performing the activity.
  - A wiki based Process Assets Library (PAL) to store projects information.
  - A set of mechanisms to store and feedback process assets with the gathered know-how from project execution.
- Measurement and analysis of quality parameters using six sigma techniques.

As seen in the Figure 1, the execution sequence could have two start points:

1. If the Project Manager needs help to select a process model that fulfills the organization necessities, he/she will execute the process model manager and the product patterns manager, after that the system will provide a set of product patterns that could be useful for the execution of each activity in a software process model. Once the Project Manager has selected a process model and the desired product patterns, the system will generate a Gantt chart with the project activities allowing the Project Manager to insert all projects regarding information such as: activities duration, resources, costs, etc.
2. If the Project Manager already knows which process model needs, it is not necessary to use process model and product patterns managers, in this case, the project manager will directly generate a Gantt chart with the project activities having the opportunity to use product patterns in

order to perform project activities.  
The platform allows project managers to export all projects information to a collaborative work environment, enabling project team members to perform project activities in a collaborative way.

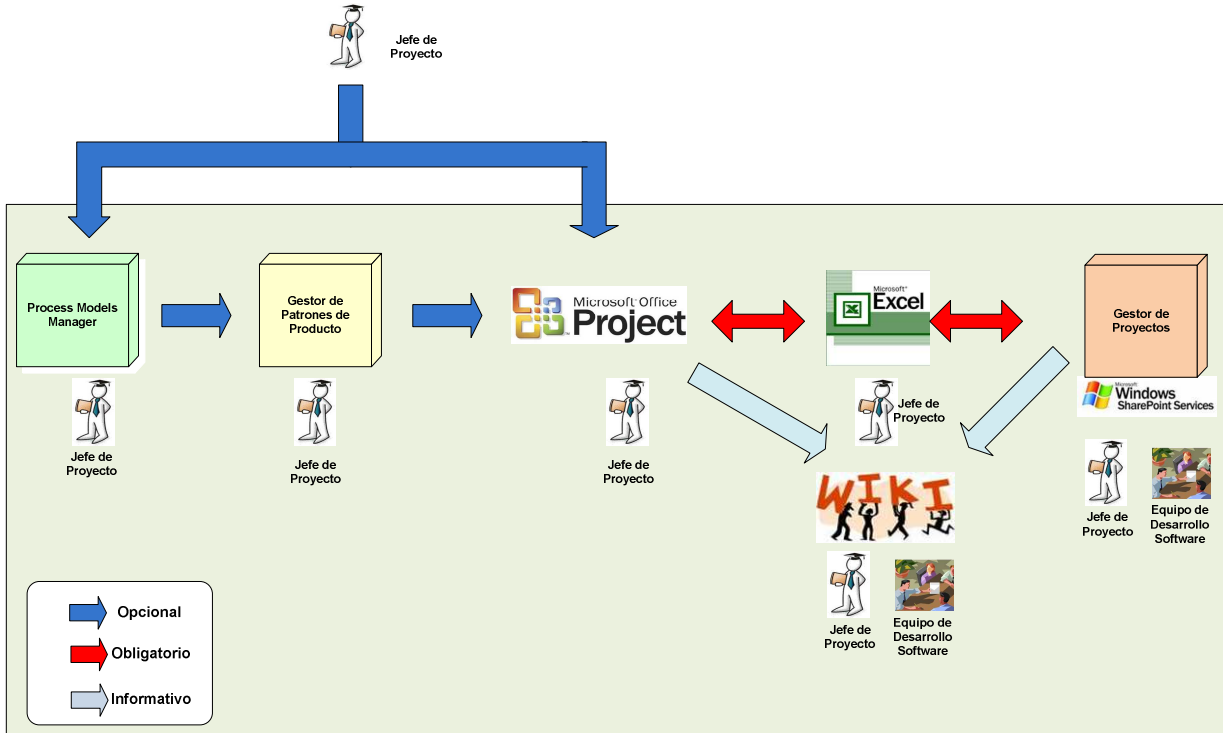


Fig. 1. Scheme of the deployment architecture of this proposal.



Fig.1 2. PIBOK-PB Model



#### Innovative aspects

- Identification of organization knowledge as a valuable asset as well as its formalization in product patterns, empowering knowledge to be used to solve similar problems or to inspire when resolving new problems.
- Improvement of the efficiency of use of processes in software projects.

Elimination of ambiguity in process and software products quality measurement thanks to the incorporation of six sigma techniques.

#### Competitive advantages

Thanks to the proposed reuse mechanisms, communication among team members is improved taking advantage of organization assets generated during the development of software projects; this allows transforming organization knowledge into innovation. Process improvement is empowered through the incorporation of six sigma techniques that fortifies process maturity as well as the organization

#### Technology Keywords

Knowledge management, processes management

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