A Web-based methodology to implement a software improvement project in small settings

Ariel E. Serrano & Jose A. Calvo-Manzano
✓ Structure of Web-based Platform
✓ Web-based Platform & CMMI Project Roadmap Mapping
✓ Web-based Platform Benefits
✓ Case Study
✓ Conclusions
Structure of Web-based Platform
Available Tools & Solutions

✓ There are:
  • Complex
  • Expensive
  • Not integrated or high integration cost
  • Requiring too much training
  • High costs for implementing improvements according to multi-model standards

• Partial use, complex tools that produce people lack of motivation, progressive disuse and final drop-out
What do projects require?

✓ International standards compliance

CMMI  
Software Engineering Institute

IEEE

IEEE Std 1058-1998
IEEE Standard 830-1998

PMBOK

ISO

International Organization for Standardization

ISO 15504 / ISO 12207

✓ But:

• Are very complex and bureaucratic
• Difficult to implement in current project management tools
• Require an exhaustive documentation work
A web-based tool that provides to Small Settings a project management solution at a low cost

- Through a set of tools providing services that allow to carry out project management activities
  - Intuitive
  - Complete
  - Integrated
  - Easy to use

Process Definition (called Coach) that provides:
- Relevant process definition to implement work packages
- Work package definition needed to perform project management
- Activity description associated with each work package
- Set of technical instructions and work products (assets) to facilitate the execution of each activity
Web-based platform architecture

Integrated Technology/People/Process oriented to project goals
Services Provides by the Web-based

on-line tools for project management

Project development

Monitoring, consultance and training in tools

Clients

Technology

Staff

Services provided

Project

Service

Process
Requirements for use the Platform

1.- Internet Access
2.- Internet Explorer
3.- MS Project.
Work Package Roles

Role

Technical trainings

Work Package

Tools

Activities

Products
Work Package Definition

- Provide standards
- Preserve the organization philosophy
The solution implements a set of tools for the lifecycle management of the work package:

- Complete
- Integrated
- Easy to use
- With defined activities for each work package
- With defined technical instructions to support the implementation of each activity related to this work package
Work Package Example

✓ Work Package: Change Management

- Elaboration
  - Elaborated
  - Rejected

- Applied
  - In evaluation
- Evaluated
  - Recovered
  - Recovered
  - Not approved

- Accepted
  - Initiate
- In Resolution
  - Validated & Verified
  - Implemented
- Cancelled
  - Recovered
  - Rejected
Web-based Platform Work Packages

- Estimations
- Resources
- Tasks
- Requirements
- Risks
- Activities
Web-based Platform & CMMI Project Roadmap Mapping
The CMMI Roadmaps (CMU/SEI-2008-TN-010) are a goal-driven approach to selecting and deploying relevant process areas from the CMMI-DEV model and can provide guidance and focus for effective CMMI adoption.

CMMI model roadmaps are tools to aid organizations that want to use the continuous representation.

The roadmaps help those organizations select which process areas to implement first, based on the improvement goals and problems that the organization wants to solve.

Organizations that choose to use roadmaps can be more confident that they have selected an appropriate set of process areas to address their initial needs.
## Five roadmaps are recognized

<table>
<thead>
<tr>
<th>Roadmap</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Roadmap</td>
<td>For organizations with project management-related goals or business problems</td>
</tr>
<tr>
<td>Product Roadmap</td>
<td>For organizations with product-related goals (e.g., for improved product quality) or business problems</td>
</tr>
<tr>
<td>Product Integration Roadmap</td>
<td>For organizations with product-assembling goals or business problems. Applicable when the primary challenge for projects is correctly integrating software components, hardware components, or both software and hardware components</td>
</tr>
<tr>
<td>Process Roadmap</td>
<td>For organizations with process management-related goals or business problems</td>
</tr>
<tr>
<td>Measurement Roadmap</td>
<td>For organizations with measurement-related goals or business problems</td>
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</table>
## Project Roadmap

<table>
<thead>
<tr>
<th>Process Area</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Planning (PP)</strong></td>
<td>This process area will help establish and maintain plans that define project activities.</td>
</tr>
<tr>
<td><strong>Project Monitoring &amp; Control (PMC)</strong></td>
<td>This process area will help provide an understanding of a project’s progress so that appropriate corrective actions can be taken if the project’s performance deviates significantly from the plan.</td>
</tr>
<tr>
<td><strong>Requirements Management (REQM)</strong></td>
<td>This process area will help manage the requirements of a project’s products and product components and identify inconsistencies between those requirements and the project’s plans and work products.</td>
</tr>
<tr>
<td><strong>Configuration Management (CM)</strong></td>
<td>This process area will help establish and maintain the integrity of selected work products using configuration identification, configuration control, configuration status accounting, and configuration audits.</td>
</tr>
<tr>
<td><strong>Process and Product Quality Assurance (PPQA)</strong></td>
<td>This process area will help provide staff and management with objective insight into the processes being defined and deployed and associated work products.</td>
</tr>
<tr>
<td>Process Areas</td>
<td>Specific Goal</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Project Planning (PP)</td>
<td>SG 1 Establish Estimates</td>
</tr>
<tr>
<td></td>
<td>SG 2 Develop a Project Plan</td>
</tr>
<tr>
<td></td>
<td>SG 3 Obtain Commitment to the Plan</td>
</tr>
<tr>
<td>Project Monitoring &amp; Control (PMC)</td>
<td>SG 1 Monitor Project Against Plan</td>
</tr>
<tr>
<td></td>
<td>SG 2 Manage Corrective Action to Closure</td>
</tr>
<tr>
<td>Requirements Management (REQM)</td>
<td>SG 1 Manage Requirements</td>
</tr>
<tr>
<td>Configuration Management (CM)</td>
<td>SG 1 Establish Baselines</td>
</tr>
<tr>
<td></td>
<td>SG 2 Track and Control Changes</td>
</tr>
<tr>
<td></td>
<td>SG 3 Establish Integrity</td>
</tr>
<tr>
<td>Process and Product Quality Assurance (PPQA)</td>
<td>SG 1 Objectively Evaluate Processes and Work Products</td>
</tr>
<tr>
<td></td>
<td>SG 2 Provide Objective Insight</td>
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</table>
Web-based Platform Benefits
Platform Benefits

✓ Integrates tools that are easy to use
✓ Provides reports & metrics (Balanced Score Board)

✓ Provides project monitoring & control
✓ Allows fixing project deviations
Platform Benefits

✓ Provide measures for each project.

✓ Documents Management & Project Library
Case Study
• INNOTEC SYSTEM
  – Innotec Chile Ltd
    • It is a consulting software company specialized in developing software for computer security and biometric software.
    • It has a software factory in Santiago de Chile
    • Is a subsidiary of INNOTEC SYSTEM, S.L. that is a software company with offices located at the most important Spanish cities.
  – Factories
    • Adobe Flex
    • J2EE
✓ Improvement program chronogram

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<thead>
<tr>
<th>Id</th>
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<td>Comienzo programa de mejora</td>
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<td>tri 1 01/01</td>
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<td>2</td>
<td>Formación Definición de Requisitos, RQM, CC, QA</td>
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<td>3</td>
<td>Formación Estimación y Gestión de Proyectos</td>
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<td>4</td>
<td>Pilotos</td>
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<td>5</td>
<td>Despliegue PP y PMO</td>
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<td>6</td>
<td>Despliegue Requisitos, PPQA, CC</td>
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</tr>
<tr>
<td>7</td>
<td>Evaluación SCAMPI C (Continuo)</td>
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Benefits using the Web-based Platform

• Improvements that Innotec is obtaining
  – The most important improvement is the rate for introducing the use of better Project Management practices
  – The team starts to work collaboratively without any tool adaption
  – The obtained metrics facilitated the organization to get some indicators that previously were so difficult to obtain.
  – The e-process guide (Zonnect Coach) facilitates the deployment because people found the process & activity descriptions easy to use
  – The organization has only one year using the Web solution tool but at present it has some improvements in:
    • Project Management (commitments using verifications checklists and the projects could be audited)
    • Quality of the management (verification and audit of our projects begin to be used)
    • Measurements & Monitoring Projects
• Process PP, PMC, REQM
  – Results
    • Project Size: 50 people
    • Schedule: 1 year
    • ROI: 4.27

Improvements:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Cots</td>
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<td>Benefits</td>
<td>158,000.00</td>
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<td>ROI</td>
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<tr>
<td>Cost/Person</td>
<td>600.00</td>
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</tbody>
</table>

Client Satisfaction
Estimation
Quality
Costs
Conclusions

- Web-based solution includes both a tool solution & process guide that allows to a Small Setting organization deploys a SPI program
- It is an integrated solution easy to deploy in supporting the CMMI Project roadmap
- The Web-based solution is low cost and easy to use
- The case study shows that it is possible to deploy a SPI program quickly with reduced costs with other consultancy services
Web-based Platform provides:

- **PLUG & PLAY. Access via internet and requires MS Project**
- **Effective, quick learning and easy to use**
- **Economic. Cost reduction by licenses**
✓ Web-based Platform help to:

- Defined Process
- Continuous Organizational Improvement
- Drive the use of automatic tools
- Metrics & Balanced Score Card
This work is co-sponsored by Zonnect and Polytechnic University of Madrid through the Software Process Improvement Research Group for Spain and the Latin American Region.
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A Web Solution to Help the Processes Improvement at Small Settings