Implementation of PMBOK along with CMMI – QCG Experience

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*Austin, USA*

Presentation By
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Quality Consulting Group
Wipro Technologies
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### Wipro Technologies – Facts & Figures

**Sustained growth**
- CAGR of 42% in last 5 years
- Part of NYSE’s TMT (Technology–Media–Telecom) Index, NSE Nifty Index and BSE Sensex

**Partner to industry leaders and challengers**
- 89 global 500 clients
- 151 clients among Forbes 2000

**Global footprint**
- Listed on NYSE
- 35 countries
- ~6000 employees onsite across Geos
- 10 near shore development centers

**Diverse talent pool**
- 23 Nationalities
- 2000 domain consultants
- 7 major acquisitions since 2003

<table>
<thead>
<tr>
<th>Revenues</th>
<th>Clients</th>
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<th>Employees ‘000s</th>
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<td>2200+</td>
<td>485</td>
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<td>51</td>
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*Ranked leader by IDC, MetaGroup, Forrester – 2004
Awarded the highest rating in Stakeholder Value Creation & Corporate Governance by ICRA, an Associate of Moody’s Investor Services
Wipro Quality Consulting Group

A specialist group: Wipro Quality Consulting Group (QCG)

- A 150+ member practice
- Client base of 60 with over 130+ different assignments being executed till date
- Translates to over million hours of consulting experience

Help clients reap the benefits of deploying process improvement initiatives

Quality Consulting – Value add to the customer
- Facilitate SPI (Software Process Improvement) initiatives to align with the business objectives
  - Improve client’s project delivery process
  - Bring quick and quantifiable improvements in all areas of project performance
  - Act as partner in clients SPI initiative

The Wipro quality consultants
- Facilitate the building of a shared vision
- Chart out a detailed road map and set milestones for achievement of the vision
- Deploy the vision along with the client team
- Add value through their experience, insights and analysis

A consultative and collaborative approach – we walk the talk

<table>
<thead>
<tr>
<th>Process Optimization</th>
<th>IT Governance</th>
<th>Software Engineering Processes</th>
<th>Infrastructure Processes</th>
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<td>CMMI / SPICE / Prince II</td>
<td>ITIL Process Consulting</td>
<td>BCP / DR Process Consulting</td>
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<td>IT Service Support</td>
<td>IT Service Delivery</td>
<td></td>
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<tr>
<td>SCRM</td>
<td>SQA</td>
<td></td>
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<tr>
<td>RUP / Agile / RAD</td>
<td>BS 15000 / 20000</td>
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</tr>
<tr>
<td>BS 7799 / ISO 17799</td>
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</tbody>
</table>

Six Sigma & Lean for continuous improvement and optimization

- Six Sigma & Lean for continuous improvement and optimization
- CMMI / SPICE / Prince II
- ITIL Process Consulting
- BCP / DR Process Consulting
- BS 15000 / 20000
- BS 7799 / ISO 17799
List of acronyms used in the presentation

- **PQMS** – Process Quality Management System which is old version of quality management system for the organization


- **CMMI**®– Capability Maturity Model® Integration (CMMI) is a process improvement approach developed by SEI

- **SCAMPI**SM–C– Standard CMMI Appraisal Method for Process Improvement–Class C Appraisal

- **SEI**– Software Engineering Institute, Carnegie Mellon® University

All trademarks and Service Marks acknowledged
Background to the Process Solution

- Senior Management of a major finance organization, CREDIT SUISSE IT PB Region Switzerland, decided to implement industry best practices for project management practices and selected PMBOK

- Before this decision, Project Management Expert Team in the organization had conceptualized Project Management Process solution based on PMBOK as a part of PQMS and developed a prototype

- Reason behind such decision by Senior Management was
  - PMBOK implementation with CMMI would bring "one of it's kind" of process solutions
  - PMBOK implementation along with CMMI would get acceptance from Project Managers from the organization

- Wipro QCG is currently involved in supporting process definition and implementation for ongoing CMMI initiative

- Wipro QCG consultants along with Project Management Expert Team and Project Management Extended Team, jointly developed the process solution which is CMMI compliant and PMBOK compatible
Comparative analysis between PMBOK and CMMI (High level) 1/2

**PMBOK**

Overall 44 processes of PMBOK organized into 5 project management process groups and 9 knowledge areas.

PMBOK also specifies possible interfaces between process groups and their overlap across project timeline.

Project Management aspects like Initiating, Executing and Closing have been elaborated along with Planning, Monitoring and Control.

Under a knowledge area process, activities are defined with inputs, tools and techniques, outputs. Processes are organized across different process groups. Interfaces between processes also have been addressed.

**CMMI**

CMMI Project Management process areas organized into Specific Practices (SPs) catering to Specific Goals and Generic Practices (GPs) catering to Generic Goals.

Apart from Planning, Monitoring and Control other three aspects Initiating, Executing and Closing have not been clearly addressed.

In CMMI framework Specific Practices, Generic Practices have been elaborated.

It provides freedom for interpretation and design of process solution which needs to meet CMMI requirements.
### Comparative analysis between PMBOK and CMMI (High level) 2/2

<table>
<thead>
<tr>
<th>PMBOK</th>
<th>CMMI</th>
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</thead>
<tbody>
<tr>
<td>PMBOK focuses only on Project Management activities</td>
<td>CMMI frame work focuses on Planning, Resourcing, Monitoring and Control, Senior management reporting for all Project Management, Engineering and Support process areas through Generic Practices</td>
</tr>
<tr>
<td>PMBOK uses terminologies common across Project Management community</td>
<td>CMMI does not prescribe any specific terminology to be followed. It is up to practitioners to adopt certain terminology and satisfy framework expectation simultaneously</td>
</tr>
<tr>
<td>Degree of usage of PMBOK processes and details mentioned, depends on organization needs</td>
<td>Organization need to satisfy CMMI Maturity Level requirements (Described in GPs and SPs) through process solutions, and ensure implementation of process solution. This needs to be formally appraised by SEI authorized lead appraiser</td>
</tr>
<tr>
<td>There is no formal appraisal for PMBOK compliance</td>
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</table>
Advantage of adopting PMBOK

**Initiating Project**
- This aspect is elaborated in PMBOK
- Recommends development of project charter and preliminary project scope documents that helps in understanding, developing project management plan and associated plans

**Project Planning**
- Scope management plan is more elaborate in PMBOK
- Planning for continuous improvement for the project is prescribed
- Details regarding organization chart, resource loading described
- Escalation management is prescribed by PMBOK
- Emphasizes more on plan for formal verification and acceptance of deliverables
- Quantitative risk analysis, strategies for positive risk or opportunities, thresh holds for mitigation and contingency action for risks

**Executing project**
- This aspect is explicitly mentioned with details of acquiring project team, developing project team, performing quality assurance, information distribution, evaluation and selection of service providers
Advantage of adopting PMBOK

Monitoring and Control of Project

- Integrated change control is more elaborate in PMBOK, where CMMI addresses Change Management in Requirements Management and Configuration Management processes areas.

- Emphasizes on scope verification (Monitoring of formal acceptance of deliverables) and scope control which supports integrated Change Management.

- Quality control aspect of PMBOK emphasizes more of preventive actions. Managing of team and HR related aspects like performance appraisal, conflict management are more elaborate in PMBOK.

Closing Project

- PMBOK recommends this as a separate process group and emphasizes on administrative closure, contract closure, final work products.

  It also elaborates more on updating organizational process assets by best practices, experiences from project.
Challenges faced and Aspects considered for Process Solution

Challenges

To design a process solution for Project Management which satisfies CMMI requirements, current organizational practice and PMBOK best practices

Definition of boundaries between Engineering lifecycle and Project Management lifecycle

Defining interfaces of Engineering lifecycle phases to Project Management lifecycle phases and vice versa

Representation of level of interaction of Project Management lifecycle phases and the way their repetitiveness to be addressed

To create an easily navigable process solution architecture where user navigates from Engineering lifecycle phases to Project Management lifecycle phases then to process, sub process and other process artifacts

Usage of process terminology which is common across the Project Management practices

Aspects considered for Process Solution

➢ Detailed mapping of CMMI with PMBOK and organization current Project Management practices

➢ All the requirements of CMMI and PMBOK

➢ For designing process architecture PMBOK representations, lifecycle model, phase relationships have been considered and interpreted suitably to organization needs

➢ Mapping of the Project Management Processes to the Project Management Process Groups and the Knowledge Areas have been considered from PMBOK
Process Solution Approach

<table>
<thead>
<tr>
<th>CMMI Project Management practices</th>
<th>Corresponding PMBOK processes</th>
<th>CMMI requirements</th>
<th>PMBOK requirements</th>
<th>Combined CMMI and PMBOK requirements</th>
<th>Questions to seek Information</th>
<th>Current practices</th>
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Analysis document

List of process deliverables

Requirements document

Context Diagram

Conceptual process solution

Process solution

Conceptual process flow diagrams
Overall Process Architecture

First Layer
First layer of the Process Architecture contains the interface between Project Management processes to Engineering Lifecycle Model.

Second Layer
Second layer of the Process Architecture contains the representation of Project Management process groups and interactions.

Third Layer
Third layer of the Process Architecture contains the detail flow representation of each process, interfaces with other processes, sub processes inputs, outputs, deliverables and associated process artifacts.

Fourth Layer
Fourth layer of the Process Architecture contains the detail flow representation of sub processes, support processes and called sub processes.
This diagram represents interfaces to ideal Waterfall Lifecycle Model.

The first layer of processes architecture contains the interface between Project Management processes to Software Engineering Lifecycle phases.

Software Engineering Lifecycle model may have different variants suitable to project needs.

This diagram represents the five process groups of PMBOK attributed to each phase of Engineering Lifecycle.

Initiating, Planning, Executing, Monitoring & Control and Closure.

The intensity at which these project management activities carried out at different Engineering Lifecycle phases may differ.
This diagram represents the Interactions between Process Groups, and repetitiveness of all Process Groups across Engineering Lifecycle phases.

This diagram represents the Interaction between Process Groups and their applicability in Engineering Lifecycle phases and over all project.
This layer represents individual process under Five Process Groups of PMBOK

Three process have been given separate status and represented outside the Five process area groups. They are:

- Risk Management
- Issue/ Escalation Management
- Change Management

These processes serve more as a support processes for one or more individual processes under each process group

Project Planning, Project Monitoring and Control and Risk Management processes areas of CMMI are incorporated in the solution along with planning, monitoring and status reporting of all engineering and support process areas.
Process Architecture – Second layer (2/3)

**INITIATING PROCESS GROUP**
- Project initiation process
  (Applicable to start of the project)
- Phase initiation process
  (Applicable to start of each phase of Engineering Lifecycle)

**PLANNING PROCESS GROUP**
- Develop Project Management Plan process
  (Applicable to start of the project)
- Phase / Milestone planning process
  (Applicable to start of each phase of Engineering Lifecycle and also to revision of Project Management Plan as and when required)

**EXECUTION PROCESS GROUP**
- Execute phase process (Applicable to task allocation, execution for the phase and production of deliverables in each phase of Engineering Lifecycle)

**MONITORING AND CONTROL PROCESS GROUP**
- Monitor and Control process
  (This is applicable to Phases and Overall project)

**CLOSING PROCESS GROUP**
- Phase closure process (Applicable to completion of deliverables of each phase of Engineering Lifecycle, logical handing over to next phase)
Process Architecture – Second layer (3/3)

Project closure process (Applicable to over all project closure, contract closure, administrative closure etc).

Each Process group is supported by one or more Knowledge area processes.

There are interdependencies between one knowledge area element to other knowledge area element to satisfy the objective of Process group.

There are also interdependencies between different elements of single Knowledge area under different process area groups.

All these have been depicted through different processes and process interfaces.
Example:

Develop Project Management Plan process

Overview

All planning aspects of PMBOK and CMMI Built into the process

The flow is depicted as per PMBOK

Usage of PMBOK terminology

CMMI terminology has been used for the aspects which PMBOK does not cater

Major deliverables

Project Management Plan with all associated sub plans
Process Architecture
Fourth Layer–Support processes

Example

Action item/ Issue/ Escalation process

Overview

Escalation aspect is not mentioned in CMMI

In PMBOK, escalation and issue mentioned but it is not mentioned as process in PMBOK

It caters to most of the processes in project management and called inside the processes as per requirement.
## Results and Benefits

<table>
<thead>
<tr>
<th>RESULTS</th>
<th>BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>- As a part of process solution 7 processes, 7 sub processes, 9 guidelines, 12 templates and 3 checklists have been produced</td>
<td>- Acceptance of process solution among the practitioners</td>
</tr>
<tr>
<td>- Process Solution has successfully undergone SCAMPI–C appraisal by SEI authorized Lead Appraiser</td>
<td>- Leads to improvement of cost and schedule performance in the projects</td>
</tr>
<tr>
<td></td>
<td>- Project Management practices across organization standardized through common terminology, consistency in practices</td>
</tr>
<tr>
<td></td>
<td>- Improved process compliance in projects</td>
</tr>
<tr>
<td></td>
<td>- Scalable process model which accommodates location and business specific tailoring and customization</td>
</tr>
<tr>
<td></td>
<td>- Alignment of Project Management processes to Engineering and Support processes brings seamless process integration</td>
</tr>
</tbody>
</table>
Acknowledgements

Sponsor of process improvement program
CIO of Credit Suisse IT PB Region Switzerland

Responsible for the program development and execution

Head of IT Methodology & Quality Management Global
Instrumental in decision to go for such process solution and provided overall guidance during development of the solution

Head of CMMI Program for CS IT Region Switzerland
Instrumental in developing project management process solution prototype based on PMBOK. Provided expert guidance and involved as a subject matter expert for review of the process solution and related process assets. Also helped in coordinating, providing resources and overall support for design and implementation of process solution

Process Area Manager for Project Management processes
Key stakeholder, involved in design, review and finalization of the process solution

Wipro QCG Consultants
For contribution in design, development and review of Process Solution
Thank you

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www.wipro.com
Appendix 1 Process architecture – Notations used

- Event
- QA Activity
- Activity
- AND Connector
- OR Connector
- XOR Connector
- Role
- Process Interface
- Input/Output connector
- Connector
- Flow
- Template
- Work Product
- Process Group
## Appendix 2–Details of activity under process

<table>
<thead>
<tr>
<th>Activity Description</th>
<th>PMBOK reference</th>
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<tbody>
<tr>
<td>Input WP / Event</td>
<td>CMMI Reference</td>
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<tr>
<td>Output WP / Event</td>
<td>COBIT/COSO References</td>
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<td>R: A: C: I:</td>
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Following details has been provided for each activity under a process or sub-process