

# 发起人高层会议总结报告

**RAGHAV S. NANDYAL**

**SITARA TECHNOLOGIES PVT. LTD.**

Dear Raghav Nandyal:

## 一、总体发现

在这次 CMMI-五级高成熟度评估中，评估师凭借其专业技能和经验，协助我们获得了对公司 CMMI 实施状况的全面了解。我们与公司各角色进行了深度访谈和文件审查，从而更好地了解了公司软件开发领域的现状。通过评估，我们获得了大量的珍贵意见和建议，这些建议为我们指明了改进的方向，并提供了提升软件开发过程质量的机会。为了进一步理解和研究这些建议的实施细节，我们邀请了公司高层经理、EPG 过程改进小组、项目经理、QA、CM、OT 等在过程改进中起到重要作用的角色，共同进行问题的回溯和讨论。在讨论中，我们一致认为发现改进项与公司的实际情况高度符合，符合度为 95%。

## 二、经验教训

我们从工程管理、项目管理、支持、过程管理四个方面为切入点分别进行详细总结。

## 工程管理

在需求阶段，我们需更深入地挖掘客户需求，使用需求分层图等工具细致地整理和细化客户需求。同时，注意评审非功能性需求如性能和安全性，了解客户对这方面的期望。在制作需求跟踪矩阵时，虽为每个里程碑制作了矩阵，但未记录中间评审可能产生的问题的解决版本。用户需求说明书与需求规格说明书部分重叠，前者关注用户最终需求，后者侧重技术需求实现。因此，要确保开发团队与客户的沟通协作有效性，准确记录和理解用户需求，定期反馈以确保两者的需求一致性。

在设计阶段，我们的接口检查单的检查项存在版本没有及时更新，接口检查项不够细化问题。我们会结合项目的实际情况，首先根据需求文档或设计文档定期更新接口检查项内容，然后在接口评审会议上，我会对接口检查项进行讲解，例如：数据流向、数据类型校验、性能和伸缩性等，评审人员会对接口检查项进行评审，改进和细化接口，确保接口的正确性和可靠性，提高项目的整体质量。

我们在记录复用分析的时候，没有充分记录复用的相关信息。

后续编码的过程中注意逻辑构建的规范和注释的规范，我们对于测试用例的编写不够详细，我们在编写测试用例时，要尽量将测试的操作描述写得详细一点，对于操作的表述，除了详细之外，还要保证不会引起歧义，对于可能包含多模块的功能，要合理安排测试顺序，减少重复测试，避免浪费时间。

在总生产率建模的时候，目前关注的重点主要在设计 and 代码，对于验证和确认的数据没有进行考量。



在进行生产率建模时，更多的是要从整体阶段去进行考虑，而不能只考虑单个阶段的数据，需要在建模前进行数据分析，确保数据的充分性，合理性，然后再去建立模型。我们目前考虑逃逸缺陷时，重点关注的设计监控和设计审查，没有进一步分析他们的相似性，并且还欠缺了对整个生命周期的考虑。

## 项目管理

在项目过程中，应定期进行项目审查、团队会议或其他形式的沟通，以确保所有重大问题都被识别和记录。在每个阶段节点，对 CAR 进行审查，确保所有重大问题都已被分析和解决，并为后续项目提供经验教训。

成功的案例应该进行根本原因分析并分享经验教训，以便复制成功的案例。这意味着要深入了解成功案例背后的因素，并确保团队成员都能从中学习并应用这些经验。

同时，代码生产率模型需要重新设计，考虑整合和优化数据表以简化维护并确保数据的一致性和可维护性。处理代码生产率数据时，要确保模型的准确性以便更好地反映实际情况。

此外，对于项目过程性能数据收集表和历史项目数据收集表中的数据，需要统一小数位数定义并严格执行，以确保数据的准确性，提高项目决策的准确性和可靠性。在项目估算方面，应在估算表中包括与项目成本相关的所有成本，如人员、差旅、设施等，以提供完整记录。选择估算方法时，应考虑选择多个方法并进行决策分析。里程碑报告中应记录所有度量项的实际值，以便更好地跟踪和了解项目的进展情况。在功能分解过程中记录整个分解过程，并在组织层面编制功能分解指南文

件以便在项目中实施。利用 Microsoft Project 等工具进行任务管理、资源管理、进度管理，并充分利用甘特图表进行跟踪和管理项目。在策划阶段清晰地统计可用资源和估算资源的状态，以协调资源并解决问题。在关键依赖识别时，应识别关键路径上的干系人，促进团队沟通和协作以确保项目按时完成并满足预期目标。

## 支持

在培训管理方面, 去推动 OT 建立一套针对新员工、骨干员工、项目管理者的各个角色的流程培训, 并进行阶段性的考核, 考核结果会记录到 OT 矩阵中, 成为后续任用和调换的重要依据。

对于已经发生的不符合项的输出, 一般来说, 项目组负责人会在项目周会时识别并纠正; 项目组 QA 在项目组审计中识别并汇报、纠正; 这些都会让不符合流程的行为尽快得到纠正和改善。

对于那些多次发生的不符合项的输出, 要对干系人进行恰当的惩罚和回溯。并对干系人进行重新培训。

目前对于检查单没有做定期更新。我们将根据项目的特性和需要, 设定定期检查的频率。对于关键项目或任务, 更频繁地进行检查。在每次检查之前, 我们会制定详细的检查计划, 包括检查的项目、检查的重点、检查的方法等。我们将按照计划进行详细的质量检查, 记录所有的观察结果、问题和建议。我们将根据检查的结果, 及时更新检查单。对于那些已经解决或不再适用的检查项, 会进行相应的调整和删除。



## 过程管理

在过程管理中，我们使用量化统计的方法以及使用统计工具来进行过程改进，不断地改进过程性能。推广使用 *Microsoft Project* 等工具进行任务管理、资源管理、进度管理，并充分利用甘特图表进行跟踪和管理项目。

### 三、现实意义

通过本次 CMMI5 的认证评估及改进，组织在管理方面具有了高度的成熟度和过程能力。项目实施达到了量化管理的水平，可以利用各种统计工具，对采集的数据进行分析，得到非常有价值的结论和模型。CMMI5 级评估对于软件开发组织和项目管理具有重要作用，它可以帮助企业提高研发过程能力、实现过程改进、提升产品质量并增强市场竞争力。

1. 实现过程改进：CMMI5 级评估可以帮助企业实现过程改进。通过评估结果，企业可以了解其软件开发过程中存在的弱点和瓶颈，进而制定相应的改进计划。CMMI5 级评估提供了一套全面的最佳实践，企业可以借鉴这些实践来改进软件开发过程，提高工作效率和质量。
2. 提高研发过程能力：通过 CMMI5 级评估，企业可以识别和量化其软件开发过程的成熟度，了解自身软件开发过程与最佳实践之间的差距，发现并改进潜在的问题。这有助于企业制定合理的目标和计划，逐步提高软件开发过程的成熟度。
3. 提升产品质量：CMMI5 级评估要求企业持续不断地提高其研发过程能力，不断优化和改善研发流程。这将导致产品和服务质量的提高，使企业能够更快地发现潜在的问题，并把问题解决在产品推向市场之前。
4. 增强市场竞争力：CMMI 认证是全球公认的软件和系统工程能力评估模型，CMMI5

级认证是最高的审核级别。获得 CMMI5 级认证代表着企业在技术水平、人才领域、市场竞争力等多方面得到了一致认可和质量保证，这将有助于提升企业内部和外部的形象和信誉，并让企业稳步推进和扩大业务及市场份额。

## 四、改进措施

经过此次 CMMI-5 级的认证，我们发现了很多自身的弱点和不足。为了推动企业的更好发展，我们将从以下几个方面进行优化和改进。

1、在编码过程中，使用代码补全和检查工具，以及自动化测试工具，可以更快地编写代码，自动发现代码中的问题，加快测试速度，从而提高生产率。

2、在项目执行过程中，会遇到预测不准确的问题，例如成本超支或时间延期。我们可以尝试使用更先进的项目估算技术，如参数估算、类比估算或三点估算。此外，还要定期审查项目的实际进度与预测进度，然后根据偏差进行调整，尽量提高预测的准确性。

3、在学习效率方面，可以学习其他公司，建设内部学习文档资料库和经验分享内部网站，用来分享和获取知识，这样新的知识就可以更快地传播开来。

4、在员工未来发展方面，应该为员工提供明确的职业发展路径和培训资源，这样员工会更开心，而且公司的技能水平也会整体提高。

经过这次高级别评估，我们不仅发现了自身的不足，还明确了未来改进的方向。为了更好地适应市场需求和提升竞争力，我们将不断优化和迭代管理体系，加强内部协作和沟通。提高组织的能力成熟度，降低运营风险，为客户提供更优质的服务。特别感谢评估师的贡献和指导，他们的专业意见和建议对我们的改进和发展起到了重要的推动作用。



我在此授权并同意您本人和 SITARA Technologies 在 SITARA 的出版渠道上分享我们的评估成果，在 SITARA Technologies 认为合适的情况下宣传我们的评估成果。

南京鼎研电力科技有限公司

发起人：徐立平

2023年12月10日



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## EXECUTIVE SESSION BRIEFING - SPONSOR FEEDBACK

**RAGHAV S. NANDYAL**  
**SITARA TECHNOLOGIES PVT. LTD.**

Dear Raghav Nandyal:





## Overall findings

*During the CMMI HM Appraisal, a comprehensive understanding of the company's CMMI implementation status was achieved with HMLA's professional skills and experience. In-depth interviews and document reviews were conducted with various roles in the company to better understand the current state of software development. The appraisal provided valuable insights and suggestions, guiding us towards improvement and offering opportunities to enhance the quality of the software development process. To delve into the implementation details of these suggestions, senior managers, EPG process improvement teams, project managers, QA, CM, OT, and other crucial roles in process improvement were invited for retrospective discussions. The consensus reached during these discussions was that the identified improvement items align well with the actual situation of the company, with a conformity rate of 95%.*

## Lessons Learned

*Detailed summaries were conducted from four perspectives: engineering management, project management, support, and process management.*

## Engineering management

*In the requirement phase, a deeper exploration of customer needs is necessary, utilizing tools such as requirement hierarchy diagrams to meticulously organize and refine customer requirements. Attention should also be given to reviewing non-functional requirements such as performance and security, understanding customer expectations in these areas. While creating requirement traceability matrices for each milestone, it is essential to document versions addressing issues that may arise during intermediate reviews. The overlap between user requirements specifications and technical specifications should be managed effectively to ensure clear communication and understanding of user needs.*

*During the design phase, issues were identified with the versioning and granularity of the interface inspection checklist. Updating the checklist content regularly based on requirements or design documents, conducting explanatory sessions during interface review meetings, and refining interfaces to ensure correctness and reliability were emphasized for improving overall project quality.*

*Insufficient documentation of relevant information occurred during the reuse analysis recording. Proper attention to logical structure and commenting during subsequent coding processes is recommended. Detailed and unambiguous descriptions in test case writing, especially for multi-module functionalities, can reduce repetition and avoid time wastage.*



*In modeling total productivity, the current focus on design and code needs to be expanded to include validation and confirmation data. A holistic approach in modeling, considering data analysis prior to model establishment, is crucial for ensuring data sufficiency and validity. Current considerations for defect escape are mainly on design monitoring and design review, lacking further analysis of their similarities and holistic lifecycle considerations.*

## Project management

*In the project process, regular project reviews, team meetings, or other forms of communication should be conducted to ensure that all significant issues are identified and recorded. At each stage milestone, reviews by using CAR are performed to ensure that all significant issues have been analyzed and resolved, providing experiential lessons for subsequent projects.*

*Successful cases should undergo root cause analysis and share lessons learned to replicate these successes. This entails delving into the factors behind successful cases and ensuring that team members can learn and apply these experiences.*

*Simultaneously, the code productivity model needs to be redesigned, considering the integration and optimization of data tables to simplify maintenance and ensure data consistency and maintainability. When handling code productivity data, it is crucial to ensure the accuracy of the model to better reflect the actual situation.*

*Furthermore, for data in project process performance data collection sheets and historical project data collection sheets, a unified decimal definition should be applied and strictly adhered to, ensuring data accuracy and improving the accuracy and reliability of project decisions. In project estimation, all costs related to the project, such as personnel, travel, facilities, and others, should be included in the estimation sheet to provide a comprehensive record. When selecting estimation methods, considering multiple methods and conducting decision analysis is advisable. Actual values of all metrics should be documented in milestone reports for better tracking and understanding of project progress. The entire decomposition process should be documented during the functional decomposition process, and organizational-level functional decomposition guidelines should be prepared for implementation in projects. Utilizing Microsoft Project and other tools for task, resource, and schedule management, and making full use of Gantt charts for tracking and managing projects are recommended. During the planning phase, clear statistics on available resources and estimation of resource status should be compiled to coordinate resources and address issues. When identifying critical dependencies, stakeholders on the critical path should be recognized, fostering team communication and collaboration to ensure on-time project completion and meeting expected goals.*

## Support



*In training management, efforts are being made to encourage OT to establish a comprehensive process training system for various roles, including new employees, key staff, and project managers. Periodic assessments are conducted, and the assessment results are documented in the OT matrix, serving as crucial criteria for subsequent appointments and transfers.*

*Regarding outputs of non-compliance issues that have occurred, typically, project team leaders identify and rectify them during project weekly meetings. Project team QA identifies, reports, and corrects these issues during project audits. These actions ensure prompt correction and improvement of behaviors not in compliance with the process.*

*For outputs of non-compliance issues that occur repeatedly, appropriate penalties and retrospectives should be applied to stakeholders. Furthermore, stakeholders should undergo retraining.*

*Currently, there is no regular update for checklists. The frequency of periodic checks will be determined based on project characteristics and needs. For critical projects or tasks, more frequent checks will be conducted. Before each check, a detailed inspection plan will be formulated, outlining the projects to be checked, key areas of focus, inspection methods, and other details. Detailed quality checks will be carried out according to the plan, recording all observation results, issues, and suggestions. The checklist will be updated promptly based on the check results. Adjustments and deletions will be made for items that have been resolved or are no longer applicable.*

## Process Management

*In process management, an approach to quantitative statistics and the use of statistical tools for process improvement are utilized to continuously improve process performance. We are promoting the use of tools such as Microsoft Project for task management, resource management, and progress management, and making full use of Gantt charts for tracking and managing projects.*

## Relevance

*Through the certification appraisal and improvements made in the CMMI HM process, the organization has achieved a high level of maturity and process capability in management. Project implementation has reached the level of quantitative management, allowing the organization to utilize various statistical tools to analyze collected data and derive valuable conclusions and models. CMMI HM appraisal plays a crucial role in software development organizations and project management, aiding enterprises in enhancing their R&D process capabilities, achieving process improvement, improving product quality, and strengthening market competitiveness.*

*Process Improvement Achievement: Enterprises can achieve process improvement with the help of CMMI HM appraisal. Through the results of the appraisal, weaknesses and bottlenecks in the software development process can be identified, leading to the formulation of corresponding improvement plans. CMMI HM appraisal provides a comprehensive set of best practices that enterprises can draw upon to enhance the software development process, thereby improving efficiency and quality.*



*Enhancement of R&D Process Capability: Through CMMI HM appraisal, enterprises can identify and quantify the maturity of their software development process. Understanding the gap between their software development process and best practices helps in discovering and improving potential issues. This assists enterprises in setting reasonable goals and plans, gradually enhancing the maturity of the software development process.*

*Quality Enhancement of Products: CMMI HM appraisal requires enterprises to continually improve their R&D process capabilities, optimizing and refining the development process. This leads to an improvement in the quality of products and services, enabling enterprises to detect potential issues more quickly and resolve them before launching products into the market.*

*Market Competitiveness Strengthening: CMMI certification is globally recognized as a model for software and systems engineering capability appraisal, with CMMI HM certification being the highest level of audit. Obtaining CMMI HM certification signifies that an enterprise has received consistent recognition and quality assurance in various aspects such as technological proficiency, talent acquisition, and market competitiveness. This helps enhance the internal and external image and reputation of the enterprise, allowing for steady progress and expansion of business and market share.*

## Improvement measures

*Following the CMMI HM certification, we have received numerous weaknesses and areas for improvement within our organization. To propel the enterprise towards better development, we will optimize and enhance in the following areas:*

*Coding Process Enhancement: In the coding process, utilizing code completion and inspection tools, along with automated testing tools, enables faster code writing and automatic identification of issues, thereby accelerating testing speeds and increasing productivity.*

*Improved Project Execution: Addressing issues of inaccurate predictions, such as cost overruns or delays, can be achieved through the adoption of advanced project estimation techniques, including parameter estimation, analogy estimation, or three-point estimation. Additionally, regularly reviewing the actual project progress against forecasted progress and adjusting based on deviations aims to enhance the accuracy of predictions.*

*Enhanced Learning Efficiency: Learning from other companies and establishing internal learning document repositories and knowledge-sharing intranet sites facilitate the swift dissemination of knowledge. This approach ensures that new knowledge is disseminated more rapidly throughout the organization.*

*Employee Development Focus: Focusing on the future development of employees involves providing clear career development paths and training resources. This not only contributes to employee satisfaction but also elevates the overall skill level of the company.*



*Through this high-level appraisal, we have not only identified our shortcomings but have also defined directions for future improvement. To better adapt to market demands and enhance competitiveness, we will continuously optimize and iterate our management systems, strengthen internal collaboration and communication, elevate organizational maturity, reduce operational risks, and provide customers with higher quality services. Special appreciation goes to HMLA and ATMs for their contributions and guidance; their professional insights and recommendations have played a crucial role in driving our improvement and development.*

*I hereby authorize and give consent to you and SITARA Technologies to share our appraisal accomplishments on SITARA's publishing channels, giving publicity to our appraisal accomplishment as SITARA Technologies deems it fit.*

Nanjing Dingyan Power Technology Co., Ltd.



Sponsor 徐立平 Xu Liping

徐立平

December 10th, 2023

