

# 发起人高层会议总结报告

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Dear Raghav Nandyal:

## 一、总体发现

在这次高成熟度评估中，我们进行了多次访谈和文件审查。通过利用贵公司丰富的经验和专业技能，我们对我公司的 CMMI 成熟度实施状况有了全面的了解。在本次评估结束后，我们获得了一系列宝贵的建议和改进意见，以进一步提升我们的运营和管理能力。本次评估发现了一些改进建议，包括度量数据的利用、代码编写规范化、项目管理精细化等方面，经过公司高层经理、EPG 过程改进小组、项目经理、QA、CM、OT 等过程改进中的重要角色回溯问题与研究讨论，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

在需求变更申请表中，优化需求变更的评估准则，既要需求变更的成本进行估算，还要考虑变更的类型，以及其他更多的维度，例如重要程度、紧急程度等，

以便于做出更加合理的评估，如果后续有效的话可以提交到组织层面，对相关工作指南进行更新。

在设计阶段，详细设计说明书中对组件的之间的交互流程，以及组件之间交互使用的通信协议和数据格式等描述应该尽可能详细，这样能确保团队成员对于组件的理解，避免一些需求上的误解，减轻开发中对项目的影晌，更有利于项目开发、减少调试和修改的工作量，提高代码的简洁度、代码质量和可靠性，提高代码的可维护性。

在代码编写阶段，代码的规范编写非常重要，如果编写的不规范，对于后期的测试人员将会带来一些不必要的麻烦，容易浪费时间和精力，而且在必要的时候添加合适的注释，使得代码具有可读性以及回溯性，也能为后期文档编写带来便利。

在编写测试用例时，需要秉持一个严谨的态度，为每个测试点编写清晰具体的操作步骤，保证测试用例编写规范，同时为反向测试设计留出空间，严格根据测试用例执行测试。在评审后测试用例产生变更后，需要先列出涉及到的相关文档，统一进行更新，而且要在需求跟踪矩阵中进行记录，有利于对需求进行一致性跟踪。

在集成测试阶段，功能测试通过并不能保证系统的整体质量，明确退出准则对于系统的整理质量至关重要。可以设定合适的集成测试用例覆盖率目标，确保系统的核心功能以及不同组件之间的交互都能够被测试到，提高系统的可靠性。可以设定合适的缺陷修复率，定义缺陷修复的时间目标、定义修复的过程，确保缺陷能够得到及时的解决。

## 项目管理

在项目管理过程中，增加了过程性能，项目管理目标可以量化预测，在量化管理过程中，如果预测项目达不成或过程性能不稳定，那么就进行原因分析与解决，以此来进行过程持续、自主的改进优化。

项目管理通过项目周报、风险管理、周例会、里程碑评审、日常监控报告等进行项目的监控。采用 project 等专业的工具编制项目进度计划，并根据实际情况实时地进行调整，对工作任务进行问题跟踪管理。针对项目的进度、工作量、需求变更、过程和质量、干系人参与计划跟踪、数据管理、风险及问题几个方面识别项目偏差，并对偏差进行分析和解决。在项目周报中进行工作量的统计分析、跟踪风险与问题、集成度量数据。

项目里程碑报告中不仅要记录项目各阶段成本消耗信息，还要增加项目管理、项目评审、项目监控、项目支持等成本信息计算各环节计划和成本之间的偏差，更加清晰的展示项目的实际进度与消耗情况，帮助干系人了解偏差的程度和影响。

项目经理应该要回顾所有项目里程碑报告中识别的风险，并及时地将风险项更新到风险与机会管理跟踪表中，有利于项目经理跟进风险的持续监控。

在制定项目计划时，要综合考虑人力、任务、环境等资源，并对项目关键依赖表模板进行优化和调整，使其更加符合项目的实际需要，然后将其提交到组织资产库，更新项目模板，必要时 OT 需要组织项目经理团队进行学习。

## 支持

在质量总结报告中对项目组的工作评价，可以使用合规检查项占比等数据准确的方式描述，比如：具体的数值，并把制定的工作评价体系更新到 QA 小组的标准库中，运用到类似的项目中去。

在决策结果的记录中需要增加相关干系人的承诺和决策实施的计划与跟踪，比如项目经理的承诺以及决策最终决定后的计划跟踪，更好的完成决策分析的相关工作。

## 过程管理

在过程管理中，我们使用量化的方法来进行过程改进，不断地改进过程性能。通过 Minitab 统计分析工具进行过程性能基线和过程性能模型的建立，还采用了水晶球工具进行 OPP0 预测。通过量化技术实现过程的稳定性，实现管理的精度，降低项目实施在质量上的波动，强化企业进行根本原因分析的能力和持续自主过程改进的能力。

在度量项的标准定义、建立基线过程时对数据的选取问题、度量统计分析的属性项单一等一些问题，我们需要去构建更加可靠、更加有效的度量标准，从而更好地评估模型的性能。需要在标准定义、数据选取、属性项单一问题、跨任务的通用性方面进行改进。在标准定义方面，我们需要有明确的定义，包括度量的目标、计算方法、可能的值范围等。在数据选取方面，我们需要确保所选数据具有代表性，以便能够准确地反映实际情况。同时，还需要考虑数据质量，确保数据的准确性和完整性。在属性项单一问题方面，如果仅考虑单一属性项，可能导致过程过于片面，

我们需要综合多个相关属性项，以便更全面地评估模型性能。度量标准应具有跨任务的通用性，以便能够公平地评估不同任务的性能模型。

### 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。为管理及决策提供了可靠的依据。在组织效率、产品质量、资源管理、项目管理能力、风险控制、客户满意度方面有较大提升。进一步也促进了公司内部的绩效管理，使部门绩效、员工绩效更加的公开透明，有据可依。也更好地为公司提升声誉和信誉。

1. 提升组织声誉和信誉：CMMI5 认证是软件行业内公认的高度认可标准，具备该认证能够增强组织在市场上的声誉和信誉。这将有助于组织获得更多的业务机会、与客户建立长期稳定的合作关系。
2. 提高组织效率：CMMI5 认证要求组织有高度的过程成熟度和优化能力，通过精细化的过程定义和管理，可以减少资源的浪费和工作中的不确定性，提高工作效率。
3. 提升产品质量和客户满意度：CMMI5 要求组织在软件开发和管理过程中采用最佳实践，并进行持续改进。通过这种方式，组织可以有效地识别和纠正潜在的问题和缺陷，提高产品的质量。
4. 提高项目管理能力：CMMI5 要求组织在项目管理方面具备高度的成熟度和能力。通过合理的项目管理实践，组织可以更好地控制项目进度、质量和成本，提高项目交付的可靠性和可预测性。
5. 增强组织竞争力：CMMI5 认证是软件开发领域中的一项重要认证，具有较高的权

威性和可信度。通过获得 CMMI5 认证, 组织可以向客户和合作伙伴展示自己在软件开发和组织能力方面的优势, 提升竞争力。

6. 优化资源管理: CMMI5 认证是组织对资源的管理和利用进行优化。通过对资源的合理规划和分配, 组织可以最大限度地利用现有资源, 提高资源利用率, 降低成本。

#### 四、改进措施

EPG 小组会将本次评估中发现的弱项、问题、建议等全部纳入《过程改进建议与跟踪表》, EPG 团队和相关人员针对《过程改进建议与跟踪表》中的建议逐项识别与讨论, 并以此制定《差距分析报告》作为现阶段组织过程改进的依据, 并对改进效果进行试点验证。改进的过程及成果资料, 我们会在下次 EPG 会议上进行评审并发布, 并同步配置更新到相应的过程资产库中。

《过程改进计划》定义了我们详细的的活动步骤、试点计划、推广方案等内容, 高层经理、EPG 成员进行研讨改进实施注意事项及潜在风险与障碍, 公司高层经理对过程改进的人员、资金、培训等资源给予了强大的支持。改进实施过程中, 相关人员也积极配合, EPG 小组选择合适的项目做改进试点, 试点反馈有效后稳步推进, 逐步扩大推广范围。

EPG 小组会对整个改进过程进行全流程监控, 对改进效果进行度量, 仔细甄别度量数据, 选择合适的模型进行量化分析, 建立预测模型和趋势分析, 预测软件开发过程和产品的质量, 在项目实施过程中持续优化项目开发过程, 提升工作效率。同时 EPG 小组针对代码规范性问题也进行了持续的监督与改进, 找到现有度量项之外的影响因子, 评估并调整度量项, 优化基线与模型, 持续提升项目整体水平。

此次评估和日常实践使我们进一步加深了对 CMMI5 的理解，也充分认识到了我们的不足，实施 CMMI5 是一个持续改进，不断优化的过程，正如我们公司的理念，进无止境。我通过培训、规范、标准化、度量、监控、沟通、协作、改进、学习等多种手段，不断提升组织的能力与成熟度水平。在这个快节奏的时代，软件的发展与市场环境也在不断变化，对我们也提出了更高的要求。提升过程管理水平，对提高客户满意度、减少缺陷和故障、提高开发效率等方面具有重要帮助，进而协助公司更好的适应市场环境，实现长期愿景。因此，我们会以 CMMI5 作为重要的工具，不断提升产品质量和管理能力。再次感谢本次评估老师的辛苦付出及专业指导。

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。



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2023 年 08 月 20 日

## Overall findings

In this high maturity appraisal, multiple interviews and document reviews were conducted. By leveraging my company's rich experience and professional skills, a comprehensive understanding of our company's CMMI maturity implementation status has been achieved. After the conclusion of this appraisal, a series of valuable suggestions and improvement recommendations were obtained to further enhance our operational and managerial capabilities. Several improvement suggestions were identified in this appraisal, including the utilization of metric data, standardization of code writing, and refinement of project management. After revisiting and discussing the issues with key stakeholders in process improvement, such as senior managers, EPG process improvement team, project managers, QA, CM, and OT, it was unanimously agreed 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 change request form, optimizing the assessment criteria for requirement changes is essential. This optimization should consider estimating the cost of requirement changes and take into account factors such as the type of change, importance, urgency, and more. This approach enables more reasonable evaluations and, if proven effective, could be submitted at the organizational level for updating relevant guidelines.

During the design phase, the detailed design specifications should comprehensively describe the interaction flow between components, as well as communication protocols and data formats used in interactions among components. This level of detail ensures a clear understanding of components among team members, reduces misunderstandings in requirements, lessens project impacts during development, and enhances code simplicity, quality, reliability, and maintainability.

In the code-writing phase, adhering to coding standards is crucial. Non-compliant code can cause unnecessary troubles for testing personnel, leading to time and energy wastage. Including appropriate comments when necessary enhances code readability, traceability, and aids in later documentation writing.

When creating test cases, a rigorous attitude is essential. Each test point should have clearly defined steps, ensuring standardized test case creation. Additionally, allowing room for negative or reverse testing is crucial. After changes to test cases following reviews, related documents need updating collectively, and changes should be recorded in the requirement traceability matrix for consistent requirement tracking.



In the integration testing phase, passing functional tests doesn't guarantee overall system quality. Clearly defined exit criteria are vital for the system's overall quality. Setting appropriate integration test case coverage goals ensures core system functions and interactions between different components are thoroughly tested, thereby enhancing system reliability. Similarly, setting appropriate defect fix rates, defining time goals for defect resolution, and outlining the fixing process are crucial to ensure timely resolution of defects.

## Project management

In the project management process, the introduction of process performance allows for quantifiable predictions of project management objectives. Within this quantified management approach, if project objectives are not met or process performance proves unstable, root cause analysis and resolution are conducted to facilitate continuous, self-driven process improvement.

Project management involves monitoring projects through project progress reports, risk management, weekly meetings, milestone reviews, and daily monitoring reports. Utilizing specialized tools such as Project, a project schedule is developed and dynamically adjusted based on real-time circumstances. Work tasks are tracked and managed for issues. Deviations within the project, including schedule, workload, requirement changes, process and product quality, stakeholder engagement, data management, risks, and issues, are identified for analysis and resolution. Workload statistical analysis, risk and issue tracking, and integrated metric data are presented in project progress reports.

In milestone reports, not only do you record cost consumption information for each project phase, but also add calculations comparing planned and actual costs for project management, review, monitoring, and support activities. This provides a clearer representation of the project's real progress and consumption, helping stakeholders understand the extent and impact of deviations.

*Project managers should review all identified risks in milestone reports and promptly update risk items in the risk and opportunity management tracking table, ensuring continuous risk monitoring.*

When formulating project plans, it's important to comprehensively consider resources such as manpower, tasks, and environment. Optimizing and adjusting the project's critical dependency matrix template to better suit actual project needs is essential. Subsequently, submitting it to the organizational assets repository and updating project templates is crucial, with the Project Manager team being organized for learning if necessary.

## Support

In the quality summary report, the evaluation of the project team's work can be accurately conveyed using data such as the percentage of compliance check items, with specific numerical values. This evaluation framework should be updated in the QA team's standard repository and applied to similar projects.

In the documentation of decision outcomes, it's important to include commitments from relevant

stakeholders and plans for implementing and tracking decisions. This could involve commitments from the project manager and plans for tracking after final decision determination. These additions enhance the completion of decision analysis-related tasks.

## Process Management

In the realm of process management, we employ quantitative approaches for continuous process improvement and performance enhancement. We establish process performance baselines and models using statistical analysis tools like Minitab, and utilize Crystal Ball for OPPO forecasting. Quantitative techniques enable us to achieve process stability, precision in management, reduce fluctuations in quality during project implementation, and strengthen our ability for fundamental root cause analysis and sustained independent process enhancement.

Regarding certain issues such as defining metric standards, selecting data for establishing baseline processes, and the singularity of attributes in metric statistical analysis, we aim to construct more reliable and effective measurement standards to better evaluate model performance. Improvements are sought in aspects like standard definition, data selection, attribute singularity, and cross-task applicability. In terms of standard definition, clarity is essential, encompassing objectives, calculation methods, and potential value ranges of metrics. When selecting data, it's important that the chosen data is representative to accurately reflect real-world situations. Additionally, data quality should be considered to ensure accuracy and completeness. Concerning the issue of attribute singularity, focusing solely on one attribute might result in a narrow view of the process; therefore, the synthesis of multiple relevant attributes is necessary for a comprehensive assessment of model performance. Metric standards should be universally applicable across tasks to impartially evaluate the performance models of different tasks.

## Relevance

Through the application of CMMI HM (Capability Maturity Model Integration for High Maturity), the organization has achieved a high level of maturity and process capability in management. The project implementation has reached a stage of quantitative management, allowing for the utilization of various statistical tools to analyze collected data and yield valuable conclusions and models. This serves as a dependable basis for decision-making and management. Notably, there has been significant enhancement in organizational efficiency, product quality, resource management, project management capability, risk control, and customer satisfaction. Furthermore, this achievement has promoted internal performance management within the company, leading to increased transparency in departmental and employee performance assessment, grounded in factual evidence. It has also contributed to elevating the company's reputation and credibility.

**Enhancing Reputation and Credibility:** The application of CMMI HM has enhanced the organization's reputation and credibility, positioning it as an industry leader in high maturity practices. This, in turn, leads to increased business opportunities and the establishment of long-term stable relationships with clients.

**Improving Organizational Efficiency:** The utilization of CMMI HM methodologies mandates a high level of process maturity and optimization capability. Through refined process definition and management, the organization can reduce resource wastage and uncertainty in work processes, thereby improving overall efficiency.

**Elevating Product Quality and Customer Satisfaction:** CMMI HM emphasizes best practices in software development and management processes, encouraging continuous improvement. This approach effectively helps the organization identify and rectify potential issues and defects, leading to higher product quality and improved customer satisfaction.

**Strengthening Project Management Capability:** CMMI HM requires organizations to demonstrate a high degree of project management maturity and capability. By implementing sound project management practices, the organization can better control project timelines, quality, and costs, enhancing reliability and predictability in project deliveries.

**Enhancing Organizational Competitiveness:** The application of CMMI HM positions the organization as a competitive force in the realm of high maturity practices. The accreditation showcases the organization's strengths in high maturity software development and organizational capabilities to clients and partners, thereby boosting competitiveness.

**Optimizing Resource Management:** CMMI HM methodologies lead to the optimization of resource management and utilization within the organization. Through proper resource planning and allocation, the organization can maximize the utilization of existing resources, thereby improving resource efficiency and reducing costs.

## Improvement measures

The EPG team will incorporate all identified weaknesses, issues, and suggestions from this appraisal into the "Process Improvement Suggestions and Tracking Table." The suggestions in the table will be systematically addressed and discussed by the EPG team and relevant personnel. This process will lead to the creation of a "Gap Analysis Report," which will serve as the foundation for the current stage of organizational process improvement based on HM practices. This report will guide the identification of improvement areas and also enable the assessment of the effectiveness of these improvements through pilot testing. The progress and outcomes of the improvement process will be reviewed and disseminated during the next EPG meeting, with simultaneous updates to the respective process asset repositories.

The "Process Improvement Plan" outlines our detailed action steps, pilot plans, and rollout strategies. Senior management and EPG members collaborate to deliberate on implementation considerations, potential risks, and barriers. The organization's senior management has provided robust support in terms of resources, funding, and training for process improvement. Throughout the implementation, involved personnel have actively cooperated. The EPG team has chosen suitable projects for improvement pilot testing, progressively expanding the scope after successful feedback, and ensuring a steady rollout.

The EPG team will continuously monitor the entire improvement process, measure the improvement effects, meticulously scrutinize metric data, select appropriate models for quantitative analysis, establish predictive models and trend analyses, and forecast software development process and product quality. The ongoing enhancement of the project development process and efficiency remains a focus. Simultaneously, the EPG team is committed to supervising and improving code

standardization issues. By identifying influencing factors beyond the existing metrics, evaluating and adjusting metrics, optimizing baselines and models, the overall project capability is continuously elevated.

This appraisal and our daily practices have deepened our understanding of HM practices and brought our shortcomings to light. The implementation of HM practices embodies a continuous improvement process, which aligns with our company's philosophy of boundless progress. Through training, standardization, metric assessment, monitoring, communication, collaboration, and learning, we consistently elevate the organization's capability and maturity levels. In this rapidly evolving era, software development and market conditions are in constant flux, presenting heightened demands on us. Elevating process management capabilities plays a pivotal role in enhancing customer satisfaction, reducing defects and malfunctions, and increasing development efficiency. This, in turn, assists the company in adapting to market dynamics and realizing long-term visions. Therefore, we view HM practices as a crucial tool to continuously enhance product quality and management capabilities. Once again, we extend our gratitude to the HM LA and ATMs for their diligent efforts and expert guidance throughout this appraisal process.

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.

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August 20th, 2023