发起人高层会议总结报告

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Dear Raghav Nandyal:

总体发现

通过 CMMI Level 5 范围界定的评估，我们公司对软件开发和项目管理流程进行了全面而细致的审查，采用了 CMMI V3.0（开发领域）标准。在此期间，进行了文档审查和面谈，并且 HMLA（主任评估师用 HMLA 代替）和 ATM 在日常开发过程和管理中准确地识别了已知和潜在的问题。

在评估期间，HMLA 结合他丰富的经验，给我们提出了很多有价值的建议。同时，在基准评估中，评估团队除了软件工程流程外，还对我们的业务流程进行了全面审查，并在可选的执行者会议中使用 SPRUM-Systemic Process Review Using Measurements®（Raghavan S. Nandyal 的注册商标），提供了对"如何进行有效的后续绩效改进计划"的更深入见解。。通过与 HMLA 的深入讨论，我们获得了宝贵的建议和指导，这为公司未来的发展指明了方向。评估过程让我们进一步的深入审视了公司现行的 CMMI 高成熟度的实施现状。公司在项目管理、流程规范化和技术研发等方面展现了较高的成熟度，具备较强的竞争力。然而，评估也指出了一些需要改进的领域，特别是在风险管控、跨部门沟通和流程持续改进方面，我们应进一步优化管理机制，提升项目的整体效率和成功率。

经验教训与改进措施

我们从工程过程、项目管理、支持过程、过程管理四个方面为切入点分别进行详细总结。

工程过程

在工程过程管理控制中，重点在设计、编码和需求方面方面，各位专家老师和评估老师给到了非常详细且落地的执行方案，例如：

按照关键词的形式对需求进行整理，明确特这个特性，例如说明确地指出功能需求、非功能需求、测试需求质量需求的关键词。

确保识别需求之间的相互依赖性。如果是别的需求之间存在冲突的话，就很难实现需求，所以要获得反馈以确保不出现冲突。

使用！或者否定"强制检查值为"1"，不符合编码规范。

在代码块中重复几次，而不是将其用作要检查的单个实例。几个 if 子句遗漏了更有用的"else"语句，但所需的单行指令跟在 if 块后面。这使得代码的可维护性成为一个问题，并可能增加完全遗漏的单元测试用例。

针对上述内容，我们已经识别以下建议。例如：重点突出：功能的优先级（高、中、低）；并 利用用例图、活动图和序列图等工具来可视化需求及其交互。通过关系映射：明确标出需求

之间的关系，包括依赖关系、包含关系和扩展关系。在代码审查过程中，特别关注类似的重复逻辑，并提供改进建议。团队成员可以共同讨论并达成一致，逐步改进代码质量。并在日常开发中，始终保持对代码的审视，发现可重构的地方，持续改进。封装条件逻辑。如果条件逻辑较为复杂，可以将其封装到一个方法中，增强可读性和重用性。

项目管理

针对估算、策划、监控等项目管理过程，评估团队也给除了很多值得思考的建议。

例如：

针对建议在估算的过程中，由项目规模进而估算出工作量、周期和资源的过程缺少详细的记录和相关的假设条件等内容，仅记录了各项估算的结果，这可能不利于后期对估算的回溯。

基于当前提升代码评审缺陷目标，不能清楚分辨出目标的实现是何种原因造成的。例如是通过代码质量的下降，还是代码专家评审技能的提升导致的。

尽管项目管理者为项目定义了项目任务的跟踪列表，但任务颗粒度不够精细，比如对任务的优先级以及任务与任务之前的前置任务等约束不足，列表另外，在任务跟踪列表也需要把项目评审、项目质量保证、项目配置纳入到任务跟踪中，以便能够为下一步工作做好充足的准备。

为了应对这些问题，我们总结了以下策略

改进项目估算过程的记录方式。在项目估算过程中，除了记录最终的工作量、周期和资源等结果，还应详细记录估算过程中的所有假设条件和相关背景信息。这包括选择的估算方法（如类比法、专家判断法或参数法），参考的历史项目数据，团队能力评估，以及外部环境因素（如市场需求、技术更新等）的影响。通过详细记录这些过程，能够在后期回溯时理解估算结果的合理性，并在条件变化时及时调整估算方法。。

针对代码评审缺陷目标不清的情况，需改进对代码评审结果的分析方法。明确评审缺陷目标的同时，细化评审过程中影响缺陷数量的因素。具体来说，需要建立更完善的质量评估机制，区分评审缺陷数量上升是因为代码质量下降还是评审人员技能提升导致的。可以通过引入具体的质量指标（如代码复杂度、覆盖率、性能等）来进行评估，并通过对比不同评审阶段的缺陷类型和数量变化，确保评审目标的实现是基于提升代码质量而非其他干扰因素。同时，开展定期培训，提升评审人员的技能水平，形成正向的评审机制。

同时我们也会要求项目管理者在定义任务时，应精细化任务颗粒度，明确任务优先级以及各任务之间的依赖关系。例如，定义任务前后置关系，确保任务的衔接与并行处理。针对任务的追踪列表，增加任务优先级和依赖关系的描述，并将项目评审、质量保证和配置管理等关键环节纳入到任务追踪体系中，确保各个任务有序推进。

综合以上措施，希望能够通过这些全面提升项目估算的准确性、代码评审的有效性以及任务管理的精细度，从而提高项目整体管理水平和执行效率。

支持过程

在支持过程中，我想在这里重点说明一下质量保证的过程。

首先在在审计过程中，需覆盖我们整个项目的生命周期，对于工程和项目管理实践方面，需更客观、全面评估各类因素对项目执行的潜在影响，以确保审计结果不仅反映表面问题，还能深入挖掘可能对项目成功产生负面影响的根本原因。以便更好地识别和应对潜在风险，以确保我们整理的质量。

此外，关于系统测试周期设置在 3 到 4 之间的做法，其合理性确实缺乏有效的验证和支持，同时反映出项目在测试阶段的管理存在不足。重复的测试周期未能提供充分的依据，可能导致资源的浪费和质量的降低。我们的项目团队在制定测试策略时，必须确保每个测试周期都具备明确的目标和充分的理由，以防止不必要的返工和资源浪费。这不仅有助于提高产品质量，还能降低由于质量问题导致的额外成本。

因此，在未来的项目中，建立清晰的炎症标准和确认机制，确保过程的高效性和合理性。同时，增强团队对质量管理重要性的认识，培养严谨的企业文化，以支持项目的成功交付和长期可持续发展。通过这些措施，可以显著提升项目的管理水平和执行效果。

过程管理

根据过程管理方面提出的一些改进建议，我们也是进行了详细的讨论和分析，制定了相应的措施。比如组织目前已经定义了性能目标，但目标之间的关系和性能提升因子，需要更全面的考虑，比如目标的提高或降低都应结合当前生产过程的实际情况进行更详尽的阐述和解释，目标之间的相互影响关系也应给与横向分析。 同时使用量化统计技术进行预测时并非一蹴而就，会经历多次的均值和标准差的调整直至达到最优改进目标，组织上只保留了最终改进目标，建议把预测的过程进行保留，以便给后续的工作留下参考。

尽管我们已经对过去三年的数据进行了梳理，但在由于我们正在经理三级-五级的升级，对于六西格玛的理论运用不够扎实，这使得我们整体的改进思路仍然具有局限性。评估师提出的一些建议，及访谈时的一些讨论，则给我们的 EPG 组和高层管理人员带来了很大的启发。我们在在追求高级成熟度的执行过程中，需要有效结合六西格玛理论与实际业务需求，以提升运营效率和质量管理水平。六西格玛作为一套严谨的数据驱动的质量管理方法，通过减少变异和提升流程控制，能够帮助我们在降低成本的同时提高产品和服务的可靠性。然而，所处软件行业、面向财务风控以及当前研发现状、文化背景和经营模式都与理论知识存在差异，因此避免过度依赖标准化模式，确保每个环节的优化能够切实解决公司面临的问题。通过不断调优和迭代，将六西格玛的核心理念嵌入企业文化，并结合行业最佳实践和创新管理模式，也成为了我们今后新的改进方向。

现实意义和展望

作为 CMMI 模型中的最高级别，通过优化管理流程、提升质量标准、促进创新和文化变革，帮助组织提高项目执行的成熟度和成功率，并通过更高效的管理与风险控制，增强在市场中的竞争力和长期发展的可持续性。

1.流程持续优化

实现持续的流程优化。通过不断分析现有流程的效果和效率，组织能够主动识别改进机会，从而持续优化项目的执行模式。这不仅能提升生产效率，还能减少项目实施中的浪费和冗余，提高资源的使用率。

2.增强质量控制

CMMI5 强调组织在项目各个阶段对质量的严格控制与改进，通过全面的质量评估机制和持续的过程优化，组织能够在产品或服务交付之前有效减少缺陷，提升产品质量。这种系统化的质量管理有助于降低返工成本，并提高客户满意度。

3.提升团队能力与工作效率

CMMI5 通过标准化和优化的流程，有助于提升团队的工作效率和协作能力。各部门的职责和流程界限清晰，使团队能够更加高效地协同工作，减少沟通误差和重复工作。同时，还促使团队成员不断学习和改进，从而提高整体的业务能力。

4.增强市场竞争力

获得 CMMI5 认证的组织，向外界展示了其在项目管理、流程优化和质量控制上的高水平能力。这对于在国际市场上竞争的企业而言，具有显著的优势，能够赢得客户的信任和认可，是我们重要的竞争优势。

5.更好地应对复杂项目

过 CMMI5 的实施，组织能够更好地管理复杂的项目。结构化流程、风险管理和精益管理思想，使得组织在面对复杂的大型项目时，能够清晰地划分各个工作环节并有效管理，使项目更加透明和可控，从而提高项目成功的概率实施 CMMI5 高成熟能力模型对于我们公司来说具有深远的现实意义。它不仅有助于提升我司的软件研发和管理水平，还能够为我司带来更高的竞争力和商业利益。因此，我们会积极拥抱 CMMI5，不断推动自身的改进和发展。

最后，我们衷心感谢评估师和各位 ATM 老师的辛勤付出和专业指导。感谢评估组提出的发现，我们很认同这些发现，感谢评估师和评估团队给出的宝贵意见。您们宝贵的意见为公司团队指明了前进的方向，为公司未来的发展奠定了坚实的基础。这些发现对于我们提高软件开发效率和质量，有很大帮助；后续我们会针对各项发现，认真落实改进，通过改进助力研发水平提升。持续提高软件开发效率和质量，提高客户满意，实现可持续发展。

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。

安徽经邦软件技术有限公司

发起人：黄红亮

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EXECUTIVE SESSION BRIEFING - SPONSOR FEEDBACK

Overall findings

Through a comprehensive and meticulous review of our software development and project management processes, our company successfully completed a benchmark appraisal scoped under CMMI Level 5, following the CMMI V3.0 (Development) standard. During this period, document reviews and interviews were conducted, with HMLA and the ATM accurately identifying known and potential issues in the daily development and management processes.

Throughout the appraisal, HMLA leveraged his extensive experience to offer us numerous valuable recommendations. Furthermore, during the benchmark appraisal, the appraisal team not only examined our software engineering processes but also thoroughly reviewed our business processes. In the optional executive meetings, they applied the SPRUM-Systemic Process Review Using Measurements® (a trademark of Raghavan S. Nandyal) to provide deeper insights into "how to conduct effective follow-up performance improvement plans." Through in-depth discussions with HMLA, we gained valuable advice and guidance, revealing a 95% compliance rate of the provided findings, which has set a clear direction for the company's future. The appraisal process allowed us to further scrutinize the current implementation of high maturity within CMMI at our company. Our organization displayed significant maturity in project management, process standardization, and technical research and development, showcasing strong competitiveness. However, the appraisal also identified areas for improvement, particularly in risk management, cross-departmental communication, and continuous process improvement, where we should further optimize management mechanisms to enhance overall project efficiency and success rates.

Lessons learned and improvement measures

We have summarized detailed conclusions in four areas: engineering process, project management, support processes, and process management.

Engineering process

In engineering process management and control, the focus lies primarily on design, coding, and requirements. The ATMs instructors and HMLA have provided very detailed and practical implementation plans. For example: Organize the requirements in terms of keywords to clearly specify the characteristics. This includes explicitly identifying functional requirements, non-functional requirements, test requirements, and quality requirements through the use of specific keywords.

Ensure the identification of dependencies between requirements. If there are conflicts between different requirements, it becomes difficult to implement them. Therefore, obtaining feedback is essential to ensure no conflicts arise.

Use "!" or negate the value "mandatory check as '1'," which does not comply with the coding standards.

Repeat the code block multiple times rather than using it as a single instance to be checked. Some "if" clauses missed the more useful "else" statements, but the required single-line instruction followed the "if" block. This affects code maintainability and might increase the risk of missing unit test cases entirely.

Based on the above, we have identified the following recommendations. For example: emphasize the priority of features (high, medium, low); use tools like use case diagrams, activity diagrams, and sequence diagrams to visualize requirements and their interactions. Through relationship mapping, clearly highlight relationships between requirements, including dependencies, inclusions, and extensions. Pay special attention to similar repetitive logic during code reviews and provide improvement suggestions. Team members can collaborate to discuss and reach consensus, gradually improving code quality. During daily development, maintain a continuous review of the code to identify areas for refactoring and make ongoing improvements.

Encapsulate conditional logic. If the conditional logic is complex, encapsulate it into a method to enhance readability and reusability.

Project Management

Regarding project management processes such as estimation, planning, and monitoring, the appraisal team has provided several thought-provoking suggestions. For example: During estimation, the process of calculating workload, duration, and resources based on project size lacks detailed documentation and relevant assumptions. Only the estimation results were recorded, which could hinder future retrospective reviews of the estimation process. In terms of improving the code review defect target, it is unclear whether the achievement of the goal is due to a decline in code quality or an improvement in the ATMs review skills. Although project managers have defined a project task tracking list, the granularity of the tasks is not detailed enough. For instance, there are insufficient constraints regarding task priority and dependencies between tasks. Additionally, the task tracking list should incorporate project reviews, quality assurance, and configuration management to ensure adequate preparation for the next phase of work. To address these issues, we have summarized the following strategies: Improving the documentation process for project estimation. Beyond recording the final results such as workload, duration, and resources, the entire estimation process should be meticulously documented, including all assumptions and relevant background information. This includes the chosen estimation methods (e.g., analogy method, ATMs judgment method, or parametric method), historical project data references, team capability appraisals, and external factors like market demand and technological advancements. Detailed documentation will allow for easier retrospective analysis to assess the reasonableness of the estimates and enable adjustments to the estimation method as conditions change.

Improving the analysis of code review results when the defect targets are unclear. We need to refine the method of analyzing the results of code reviews by clearly defining defect targets and identifying factors that affect the number of defects during the review process. Specifically, establishing a more robust quality appraisal mechanism to distinguish whether an increase in defects is due to declining code quality or the improvement in the reviewer's skills. By introducing specific quality metrics (such as code complexity, coverage, and performance) for appraisal, and comparing the type and number of defects across different review stages, we can ensure that defect targets are achieved through improvements in code quality rather than external factors. Regular training should also be conducted to enhance the skills of reviewers, forming a positive review mechanism.

Additionally, project managers should refine the granularity of tasks when defining them, specifying task priorities and the dependencies between tasks. For example, define the preconditions and sequence of tasks to ensure proper task alignment and parallel processing. In the task tracking list, include descriptions of task priorities and dependencies, and incorporate key phases such as project reviews, quality assurance, and configuration management into the tracking system to ensure that tasks progress smoothly. By implementing these measures, we hope to significantly improve the accuracy of project estimation, the effectiveness of code reviews, and the precision of task management, ultimately enhancing the overall management level and execution efficiency of the project.

Support process

During the support process, I would like to highlight the quality assurance procedure. First of all, during the audit, we must cover the entire project lifecycle. For engineering and project management practices, we need to objectively and comprehensively appraise various factors that may impact project execution, ensuring that audit results do not merely reflect surface-level issues but delve into the root causes that may negatively affect the project's success. This helps in better identifying and addressing potential risks, ensuring that the quality we have consolidated remains intact. Additionally, concerning the practice of setting the system testing cycles between three and four, its rationality lacks effective validation and support, indicating deficiencies in test phase management. Repeated test cycles without substantial justification may lead to wasted resources and degraded quality. When formulating testing strategies, our project team must ensure that each testing cycle has a clear objective and solid reasoning to prevent unnecessary rework and resource waste. This will not only improve product quality but also reduce additional costs caused by quality issues. Therefore, in future projects, it is essential to establish clear confirmation criteria and verification mechanisms to ensure process efficiency and rationality.

At the same time, it is crucial to enhance the team's awareness of the importance of quality management and foster a rigorous corporate culture to support the successful delivery of projects and long-term sustainable development. These measures will significantly enhance the management and execution efficiency of the projects. Process Management Based on some improvement suggestions for process management, we conducted detailed discussions and analyses, and formulated corresponding measures. For instance, although the organization has defined performance targets, the relationship between targets and performance improvement factors needs to be considered more comprehensively. Both the increase and decrease of targets should be explained in detail based on the actual conditions of the current production process. The interactions between targets should also be analyzed horizontally. When using quantitative statistical techniques for forecasting, it is not an immediate process, but involves multiple adjustments of mean values and standard deviations until the optimal improvement goals are achieved. The organization has only kept the final improvement goals, so it is recommended to retain the entire forecasting process to provide a reference for future work. Although we have sorted through the data from the past three years, due to our ongoing upgrade from level three to level five, our application of Six Sigma theory has not been solid enough. This has resulted in certain limitations in our overall improvement strategies. Some suggestions from HMLA and discussions during interviews have greatly inspired our EPG group and senior management. As we pursue higher maturity levels, we must effectively combine Six Sigma theory with actual business needs to enhance operational efficiency and quality management. Six Sigma, as a rigorous data-driven quality management methodology, helps by reducing variance and improving process control, enabling us to lower costs while improving the reliability of products and services. However, in our software industry, with a focus on financial risk control, coupled with the current R&D status, cultural background, and business model, there are discrepancies between theoretical knowledge and practical application. Therefore, it is important to avoid over-reliance on standardized models and ensure that the optimization of each process step genuinely addresses the company's challenges. By continually tuning and iterating, embedding Six Sigma's core principles into our corporate culture, and integrating industry best practices with innovative management models, we have identified a new direction for future improvements.

Process management

Based on some improvement suggestions proposed in process management, we have also conducted detailed discussions and analysis, and formulated corresponding measures. For example, the organization has already defined performance goals, but the relationship between goals and performance improvement factors need to be considered more comprehensively. For example, the increase or decrease of goals should be elaborated and explained in more detail based on the actual situation of the current production process, and the mutual influence relationship between goals should also be analyzed horizontally. When using quantitative statistical techniques for prediction simultaneously, it is not achieved overnight. It will go through multiple adjustments of mean and standard deviation until the optimal improvement goal is reached. The organization only retains the final improvement goal. It is recommended to keep the prediction process for reference in subsequent work.

Although we have reviewed the data from the past three years, our overall improvement approach is still limited due to the lack of solid theoretical application of Six Sigma as we are upgrading from Level 3 to Level 5. The suggestions put forward by the evaluator and the discussions during the interview have provided great inspiration for our EPG team and senior management. In the process of pursuing advanced maturity, we need to effectively combine Six Sigma theory with practical business needs to improve operational efficiency and quality management level. Six Sigma, as a rigorous data-driven quality management approach, can help us improve the reliability of our products and services while reducing costs by reducing variation and enhancing process control. However, there are differences in the software industry, financial risk control, current research and development status, cultural background, and business model compared to theoretical knowledge. Therefore, it is important to avoid excessive reliance on standardized models and ensure that the optimization of each link can effectively solve the problems faced by the company. By continuously optimizing and iterating, embedding the core concept of Six Sigma into the corporate culture, and combining it with industry best practices and innovative management models, it has also become our new direction for improvement in the future.

Relevance and Planned Actions

As the highest level within the CMMI model, it helps organizations enhance project maturity and success rates by optimizing management processes, improving quality standards, promoting innovation, and driving cultural change. It also strengthens market competitiveness and ensures sustainable long-term development through more efficient management and risk control.

1. Continuous Process Optimization Achieving continuous process improvement is key. By regularly analyzing the effectiveness and efficiency of existing processes, organizations can proactively identify opportunities for improvement, leading to a constantly optimized project execution model. This not only boosts production efficiency but also minimizes waste and redundancy during project implementation, thereby increasing resource utilization.

2. Strengthened Quality Control CMMI HM emphasizes strict control and improvement of quality at every stage of a project. Through comprehensive quality appraisal mechanisms and ongoing process optimization, organizations can effectively reduce defects before delivering products or services, significantly enhancing product quality. This systematic quality management approach helps lower rework costs and boosts customer satisfaction.

3. Enhanced Team Capability and Work Efficiency By standardizing and optimizing processes, CMMI HM aids in improving team efficiency and collaboration. Clear delineation of departmental responsibilities and process boundaries allows teams to work together more effectively, reducing communication errors and duplicated efforts. Furthermore, it encourages team members to continuously learn and improve, thereby enhancing overall business capabilities.

4. Increased Market Competitiveness Organizations that achieve CMMI HM demonstrate their high-level competence in project management, process optimization, and quality control. For companies competing in international markets, this provides a significant advantage, winning the trust and recognition of clients—an important competitive edge for us.

5. Better Management of Complex Projects Through the implementation of CMMI HM, organizations can better manage complex projects. With structured processes, risk management, and lean management principles, organizations are able to clearly define work segments and manage them efficiently when facing large, complex projects.

This increases project transparency and control, ultimately improving the likelihood of success. The implementation of the CMMI HM high-maturity capability model holds profound practical significance for our company. It not only aids in enhancing our software development and management capabilities but also brings us greater competitiveness and commercial benefits. As such, we will actively embrace CMMI HM, continuously driving our own improvement and development. Lastly, we sincerely thank HMLA and all the ATM instructors for their hard work and professional guidance. We appreciate the findings raised by the appraisal team, and we wholeheartedly agree with them. We are grateful for the valuable insights provided by HMLA and the appraisal team, which have pointed our company in the right direction and laid a solid foundation for its future growth. These findings will greatly help us improve the efficiency and quality of our software development. Moving forward, we will take these findings seriously, implement necessary improvements, and continuously elevate our development capabilities. By enhancing software development efficiency and quality, we aim to boost customer satisfaction and achieve sustainable development.

As the sponsor of this appraisal who has received the executive session briefing, 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".

Anhui CNBI Software Technology Co., Ltd

Sponsor: Huang Hongliang

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