

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

在过去的几天里，我们对 CMMI-五级进行了高成熟度的评估，并对公司目前软件开发相关的各个角色进行访谈和文档审查，通过学习，我们深入了解了 CMMI 成熟度实施状况，同时也获取了很多宝贵的建议和改进意见，之后我们也会针对性的补足这些问题点，包括本次评估中发现的一些改进建议，包括代码编写规范化、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

在需求开发过程中，在需求开发通过同行评审后，需求人员应当针对于此次需求的可扩展性、可复用性、用户交互合理性以及设计规范性等维度，对标同行竞品进行总结与反思，并取长补短，将该次需求尚不完美的整改项进行记录，并将整改

项转化为需求优化项，规划进下次迭代任务中，这些需求优化项的优先级会结合项目人力情况低于客户所提出的新需求。在需求优化完成后，应该总结此次需求设计方案，以 ppt 的形式对其他项目组成员输出，并在公司内部进行宣讲，以供其他项目组成员在自己的工作中使用或是参考。

在设计阶段，我们将参考和遵循国际标准接口的使用规范，制定统一的标准，例如在下拉选择组合框等组件的使用上，针对下拉选项的默认排序进行统一规范要求，按照英文字母或中文拼音在字母表中的顺序进行排列；此外，我们会遵循并采用全球公认的 GUI 标准规范改进提升并完善我们公司的 UI 设计规范，并加强培训；最后，我们也会在同行评审以及《评审检查单》中添加对标准设计规范的检查项，以确保项目团队按照规范设计和执行。

在代码编写阶段，大家也深刻认识到代码编写规范性的重要性，在代码 review 的重点增加代码的可读性、可维护性的评审检查，另外使用云效流水线中的代码规范性、安全性以及漏洞检查，及时发现并改正问题。

在测试时，需进行测试估算有效性分析，保障估算的准确性，在实际工作中去收集一些测试指标数据，如测试工作量、进度、成本等，跟估算的数据进行比较分析，如果发现误差较大，及时进行分析调整，并持续跟踪评估，不断提升估算有效性。

项目管理

在项目管理过程中，加强对项目进行全流程管理，包括但不限于工作量，成本，

进度等。项目组内部会充分做好项目规模和工作量的预估，并框定项目范围制定各阶段任务列表分配到个人，项目经理定期组织周会或里程碑会议，来对项目各过程实施情况度量和量化分析，了解各阶段模块工作量达成率、成本支出以及进度达成情况，存在偏差的及时制定改进措施，并跟踪改进效果。

针对项目环境整个过程的追溯，我们会去跟新现有的组织定义的《工作环境标准》，我们会将整个项目环境的选择确认的过程形成文件化作为要求更新到《工作环境标准》中，然后在使用的过程中确保大家严格按照《工作环境标准》实施。

支持

在配置管理方面，我们将引入自动化代码检测工具（如 SonarQube、FindBugs、CodeCoverage 等）识别重复代码、无效注释、缺陷、漏洞、潜在 bug、复杂度、单元测试覆盖率等，出具《代码检测报告》并由 CM 进行评审检查；同时要求项目技术负责人定期对项目代码进行 codereview 留存记录并由 CM 评审检查。

过程管理

在过程管理中，我们使用量化的方法进行过程改进，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 OPPO 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。

在培训方面，公司建立培训学习的激励机制，鼓励员工建立学习计划，针对完成学习计划的员工发放相关结业证书，建立荣誉感；公司的晋升工作也会参考员工的主动学习情况（如课程、时长等），鼓励员工持续学习成长；深度调研员工培训学习需求，使培训内容更加贴近员工真实学习需求，从内容上吸引员工参加。

三、现实意义

通过本次 CMMI5 的认证评估及改进，公司各方面的能力均有很大的提升，尤其在软件开发、项目管理，过程改进方面。通过标准化的流程和制度，规划内部的管理和交付的质量。基于此次评估，高层也提出了“交付实施标准化、解决方案专业化、专业技术产品化、平台运营体系化、内部管理精细化”的管理理念。切实以高标准引领高质量服务，进一步提升了公司的品牌形象和影响力。

1、降低软件开发的成本和风险：CMMI-五级认证的标准化过程可以帮助组织识别和消除潜在的风险和问题，降低软件开发的成本和时间，提高软件交付的可靠性和稳定性。

2、提高软件产品的市场竞争力：CMMI-五级认证的软件开发过程可以提高软件产品的质量和可靠性，进而提高产品的市场竞争力，增加产品的市场占有率和盈利能力。

3、提升组织的声誉和品牌形象：通过 CMMI-五级认证，公司可以证明公司具有成熟和规范的软件开发过程，提高组织的声誉和品牌价值，进而吸引更多的客户和投资者。

综上所述，CMMI-五级认证对于组织的软件开发能力和效率、软件开发的成本和风险、软件产品的市场竞争力以及组织的声誉和品牌价值等方面都具有重要的现实

意义。

四、改进措施

通过此次 CMMI-五级模型认证，我们也发现了自身很多的弱项和不足。未来也会从以下几个方面，进行优化改进，助力企业更好地发展。

在测试过程中，我们计划去引进扩容现有测试环境的硬件配置，来提升我们在单元测试、产品集成方面的能力，能够有效发现可能存在的高并发和性能瓶颈问题，降低生产环境的缺陷率。

在编码过程中，我们也会让开发人员共同遵循一套公司通用的编码规范，在此基础上鼓励大家分享更多高质量高性能的代码来汇编成代码示例集，让更多新入职的研发人员能够尽快熟悉并融入团队，提高编码可读性和规范性。

在跨部门协同方面，建立统一的线上协作平台，方便团队成员之间的沟通和协作，提高工作效率。支持任务分配、进度跟踪、提醒等功能，帮助团队成员更好地完成任务，减少劳动成果和错误。

在项目管理方面，我们将搭建一套数字化项目管理平台，将从项目立项到结项的全生命周期过程进行跟踪管理并度量和量化管理形成各项数字化指标，方便公司高层以及项目团队更清晰了解和监控项目的各阶段实施情况，保障项目的交付质量。

在质量管理方面，公司将尝试增加质量管理部门的人员，以确保有足够的资源来支持过程改进实施组；持续完善质量管理制度，以确保在实施 CMMI 过程中有明确的标准和流程；引入自动化测试工具来提升测试的效率，引入成熟的构件库和低代码开发工具来提升编码质量。

在配置管理方面，将持续优化配置管理流程，根据实际情况不断地改进，以提

高配置管理的效率和准确性；提代码审查的审查标准，尽早发现和解决潜在的质量问题 and 安全问题，确保代码质量；完善建立配置控制制度，包括版本管理、变更管理、代码审查等，确保配置管理的可控性。

在绩效考核评估方面，我们尝试引入 KPI 双线绩效考核工具，分季度量化绩效目标，增加全维度评价体系，对项目人效产出、执行力和工作态度、跨部门协同工作、自我学习成长等方面达成进行量化考核。对于绩效不合格的给予重点关注和提出改进要求。

在过程规范性审查方面：由公司组织人力资源和安全生产部门针对项目各阶段过程和流程管理进行审查，以确定其中的改进机会。不定期收集员工的反馈和意见建议，对于提出建设性意见的员工给予嘉奖。此外通过经营月报让员工了解公司和项目的阶段推进进展情况。

通过这次的高级别评估，公司的高层及全体员工均加深了对该体系的认证，也深刻认识到我们的不足和未来改进的空间，体系的认证和内化是一个长期的，不断自检优化，循环往复的过程。我们将通过内部标准化的管理，辅之以各部门的密切协作，不断提升组织的能力域成熟度水平。进而降低缺陷和故障发生率，提升客户满意度，帮助公司拓展更广阔的市场。再次感谢本次评估师的辛苦付出以及专业的指导。

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。

数字郑州科技有限公司

发起人: 张晓霞

2023年10月30日

EXECUTIVE SESSION BRIEFING - SPONSOR FEEDBACK

RAGHAV S. NANDYAL
SITARA TECHNOLOGIES PVT. LTD.

Dear Raghav Nandyal:

Overall findings

In the past few days, an appraisal was conducted on our company according to CMMI Level 5 standards. Interviews and document reviews were carried out for various roles related to software development within the company. Through this process, a thorough understanding of the implementation status of CMMI HM was gained, along with valuable suggestions and improvement recommendations. These identified issues, including suggestions for code standardization and project management refinement discovered during this appraisal, will be addressed. Important roles within the company, including senior managers, the EPG process improvement team, project managers, QA, CM, OT, and others, were involved in retrospective discussions. It was unanimously agreed that these identified improvement items align highly with the company's actual situation, with a match rate of 95%.

Lessons Learned

Detailed summaries were made from the perspectives of engineering management, project management, support, and process management.

Engineering management

In the requirements development process, after peer reviews, the requirements team should analyze and reflect on the scalability, reusability, user interaction rationality, and design compliance of the current requirements, benchmarking against peer competitive products. Deficiencies found in this appraisal should be recorded and transformed into requirement optimization items, which will be planned into the next iteration tasks. The priority of these optimization items will be determined considering the availability of human resources in comparison to new client requirements. After requirement optimization, a summary of the requirement design should be created and presented to other project team members in the form of a PowerPoint presentation. This presentation should also be made internally within the company for other project team members to use or refer to.

During the design phase, international standards for interface use will be adopted and adhered to, and unified standards will be created. For components like dropdown select boxes, uniform requirements for the default sorting of dropdown options will be established, ordering them according to the alphabetical order or Chinese Pinyin. Furthermore, globally recognized GUI standards will be followed and incorporated into our company's UI design standards, with enhanced training. Inspection items related to standard design specifications will also be added to peer reviews and "Review Checklists" to ensure that project teams design and execute projects in accordance with the established standards.

It was realized that code standardization is of vital importance during the coding phase. The focus of code review will be expanded to include code readability and maintainability. In addition, code standardization, security, and vulnerability checks from tools such as SonarQube, FindBugs, and CodeCoverage within the YunEff pipeline will be used to detect and correct issues promptly.

Effective testing will involve the analysis of test estimation accuracy, ensuring that the estimation is accurate. In actual work, relevant test metrics such as workload, progress, and cost should be collected and compared with estimated data. If significant discrepancies are identified, prompt analysis and adjustments should be made to continually track and enhance estimation effectiveness.

Project management

In the project management process, full-process management of the project, including workload, cost, and progress, should be strengthened. The project team should adequately estimate project scale and workload and allocate tasks for each project stage. Project managers should regularly organize weekly or milestone meetings to measure and quantitatively analyze the implementation status of each project process. This includes assessing module workload achievement, cost expenses, and progress achievement. If any deviations are found, improvement measures should be developed promptly, and the effectiveness of these improvements should be tracked.

For retrospectives on the entire project environment, updates to the existing organizational definition of the "Work Environment Standards" will be performed. Documentation of the entire project environment selection and confirmation process should be updated as a requirement in the "Work Environment Standards." This ensures that all teams strictly follow the "Work Environment Standards" during implementation.

Support

In the area of configuration management, automated code analysis tools such as SonarQube, FindBugs, CodeCoverage will be introduced to identify duplicate code, invalid comments, defects, vulnerabilities, potential bugs, complexity, and unit test coverage. Reports of code analysis, "Code Inspection Reports," will be reviewed by CM. Also, project technical leaders will regularly review and document project code in accordance with codereview, which will be reviewed by CM.

Process Management

In process management, quantitative methods will be utilized to perform process improvements. Minitab statistical analysis tools will be employed for establishing process performance baselines and process performance models. The Crystal Ball tool will be used for OPPO forecasting. Quantitative techniques will be used to ensure process stability, management accuracy, reduce project implementation quality fluctuations, strengthen the ability to perform root cause analysis, and enhance continuous self-initiated process improvements.

Regarding training, the company will establish an incentive mechanism for training and learning. Employees will be encouraged to create learning plans, and those who complete these plans will receive relevant certificates, fostering a sense of achievement. Employee promotion evaluations will consider their proactive learning, including courses and duration, encouraging continuous learning. Deep research will be conducted into employee training and learning needs to make training content more relevant to their actual learning requirements and make it more appealing to employees.

Relevance

Through this CMMI HM appraisal, significant progress has been made across various aspects of the company, particularly in software development, project management, and process improvement. By implementing standardized processes and systems, the quality of internal management and service delivery is planned to be enhanced. Based on this appraisal, senior management has introduced a management philosophy of "standardized implementation of delivery, specialization of solutions, product specialization of professional technology, system operation, and fine internal management." This high standard leads high-quality services, further enhancing the company's brand image and influence.

Lowering Software Development Risks and Costs: The standardized processes from CMMI-HM appraisal can help organizations identify and eliminate potential risks and problems, thus reducing the cost and time of software development. This enhances the reliability and stability of software delivery.

Enhancing Software Product Market Competitiveness: The software development process resulting from CMMI-HM appraisal can improve software product quality and reliability, which, in turn, increases product market competitiveness, market share, and profitability.

Elevating Organizational Reputation and Brand Image: CMMI-HM appraisal demonstrates that a company has mature and standardized software development processes, which can elevate the organization's reputation and brand value, attracting more customers and investors.

In conclusion, CMMI-HM appraisal has significant real-world implications for an organization's software development capabilities and efficiency, software development risks and costs, software product market competitiveness, and the organization's reputation and brand value.

Improvement measures

The CMMI-HM appraisal has identified several weaknesses and areas for improvement. In the future, optimization and improvement will be pursued in several areas to help the company develop further.

In the testing process, plans are in place to introduce hardware configuration upgrades to the existing testing environment to enhance capabilities in unit testing and product integration. This will effectively identify potential issues related to high concurrency and performance bottlenecks,

reducing defect rates in the production environment.

In the coding process, development personnel will be encouraged to collectively adhere to a set of company-wide coding standards. On this basis, there will be an encouragement to share more high-quality, high-performance code to compile a code sample collection. This will help new R&D team members familiarize themselves with the team quickly, improving code readability and standardization.

For cross-departmental collaboration, a unified online collaboration platform will be established to facilitate communication and cooperation among team members. It will support task assignment, progress tracking, reminders, and other functions to assist team members in completing tasks more effectively and reduce errors.

In project management, a digital project management platform will be established to track and manage the full lifecycle of projects from initiation to completion. It will quantify various aspects of the project and provide a clear view of project status for senior management and project teams, ensuring the quality of project deliveries.

In quality management, the company plans to increase the personnel in the quality management department to provide adequate resources for process improvement implementation teams. Continuous refinement of quality management systems will be conducted to ensure that there are clear standards and processes during the implementation of CMMI processes. Automated testing tools will be introduced to improve testing efficiency, and mature component libraries and low-code development tools will be implemented to enhance code quality.

Regarding configuration management, continuous optimization of configuration management processes will be carried out, adapting to the actual situation to improve efficiency and accuracy. Code review standards will be improved to detect and resolve potential quality and security issues early, ensuring code quality. A configuration control system will be established, including version management, change management, code reviews, to ensure the controllability of configuration management.

In performance assessment, the company plans to introduce KPI dual-line performance assessment tools to quantitatively assess performance objectives on a quarterly basis. A multi-dimensional evaluation system will be expanded to quantitatively assess performance in areas such as productivity,

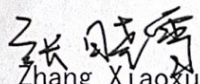
execution, work attitude, cross-departmental collaboration, and self-learning. Unsatisfactory performance will be given focused attention and improvement requirements.

Regarding process standardization reviews, the company's human resources and safety department will conduct reviews of project process and process management at various stages. This is done to identify opportunities for improvement. Feedback and suggestions from employees will be collected intermittently, and employees who provide constructive feedback will be recognized. In addition, employees will be kept informed of project and company stage progress through business reports.

Through this appraisal, the senior management and all employees have deepened their understanding of this system and recognized our shortcomings and opportunities for future improvement. The certification and internalization of this system is a long-term, cyclical process of self-assessment and optimization. With standardized management within the company and close collaboration among departments, the organization's maturity levels and capabilities will continue to improve. This, in turn, will reduce defects and failures, enhance customer satisfaction, and help the company expand its market presence. Once again, thanks are extended to the HMLA team for their hard work and professional guidance.

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.

ZhengZhou Digital Technology Co., Ltd


Sponsor: Zhang Xiaoxue

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