发起人高层会议总结报告

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Dear Raghav Nandyal:

一、总体发现

在本次 CMMI 高级成熟度评估中，主任评估师 Raghav S. Nandyal 带领着评估团队进行了一周的辛勤工作，举行了多场访谈，与此同时，还协助我们使用 SPRUM -Systemic Process Review Using Measurements® 对业务流程进行了全面回顾，Systemic Process Review Using Measurements® 是 Raghavan S. Nandyal 的注册商标。通过他们丰富的经验和专业的技能，全面了解了我们公司实施 CMMI 的情况,同时也帮助我们对业务流程进行全面复盘，整个认证流程为我公司运营中的决策提供了重要思路，我们在评估结束后,会根据提供了宝贵的改进建议，进一步提高运营和管理水平。本次评估总共发现了 26 项改进建议。改进建议分为工程管理、项目管理、支持管理、过程管理 4 类其中，工程管理 5 条，项目管理 5 条，支持 8 条，过程管理 8 条。经过公司高层经理、EPG 过程改进小组、项目团队，支持团队等公司的重要角色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 100%。

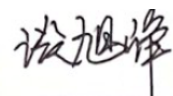## 二、经验教训

我们从工程管理、项目管理、支持、过程管理四个方面分别进行总结。

工程过程

在项目质量方面:要更加关注对交付前后发现缺陷的比对分析。通过对比分析,关注缺陷变化，缺陷密度的变化。比如，梳理是否有的问题曾经出现过，是否有没有发现的问题。如是曾经出现过的问题再次发生，或者出现没有发现过的问题,则需要与需求、开发、测试人员共同复盘分析是哪个过程环节有所疏漏，是由于工作方法的问题、人员能力问题，经验问题或是态度问题，充分剖析问题有利于积累经验和能力提升。

在初验阶段模拟客户试用，进一步发现需求范围内的细节问题，以及检验系统在实际情况下的状态。客户的测试关注点和使用习惯与测试人员及开发人员可能不同，通过这个过程，可以更多的客户使用方面的暴露问题，开发人员和测试人员会更加换位思考，从客户的使用方便性、界面简洁美观、系统的易用性方面有更好的理解，在后续的开发测试中，开发人员在关注基本功能可用的基础上，更加关注客户感受，提高人员效率和能力。

在项目需求方面:会在后续项目中，尽可能为每一个功能编写场景流程图，以便于相关干系人可以理解开发需求的场景，加强审核，原型图与功能需求进行一一对应,核查有无遗漏。

在开发方面：严格按照开发流程和规范进行，控制代码圈复杂度。

项目管理

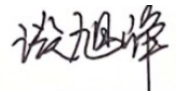在制定项目计划文件前，提前规划好项目需要的人员技能要求;制定培训内容，了解被培训人的技能水平，已更好的胜任岗位要求。

项目估算时使用组织质量月报的量化指标，可以提高估算的准确性。在需求、设计阶段估算时,增加文档页数的量化指标;在开发阶段估算时，优化当前代码行的量化指标;在测试阶段估算时，增加测试用例数量的量化指标。确保评价内容的颗粒度、估算值的准确性。

在监控中记录中增加问题的解决方案、问题影响的范围、问题解决的责任人、问题整改审核人,使之责任到人，并在每次晨会、周例会上要对问题跟踪一栏表中的问题点进行及时跟踪，及时保障问题的有效解决。。

支持过程

基于老师的建议，我们会组织 EPG 小组成员及相关工程领域的资深人员对我们的研发流程进行深入的分析，综合考虑相关过程和数据建立更切合我们的模型。并在相关项目中进行试点，检验试点效果，再做分析，如果符合预期，在组织内部进行推广。具体过程如下：

    1、整理分析目前的模型和工作量偏差的数据，收集汇总目前的数据。

    2、收集、汇总相关可用模型,会议讨论模型的可用性,结合自身的研发流程选择合适的模型进行试点。

    3、验证模型的有效性，确定模型是否适合推广，如果适合推广，在组织内部进行普遍使用。

    4、定期总结分析模型的有效性，进行实时的调整优化。

过程管理

我们会根据老师的建议，全面整理资产库中对于复用部分的标准内容，充实复用库的内容。对资产库中的复用方式和复用层次进行明确，明确是属于代码复用还是业务复用，业务复用的话是业务实体复用针对细分的业务领域，业务流程的复用针对的是业务场景。从代码复用到业务复用，越往上，复用程度越高，复用产生的价值也越大，但实现起来也越复杂，它能复用的场景就越有限。在后续的实际工作中，代码层面上的复用相对比较简单，我们对这部分的认知也最多，而且由于开源的普及，现在有丰富的中间件可供我们选择，我们可以基于这些，逐步构建适合我们公司的技术体系。更进一步整理业务中间件，并在此基础上，形成相关的业务平台，这样，我们就能实现更高的业务级复用，可以更高效地支持系统的快速落地，让相关中间件产生最大的价值，提升公司的研发能力。

三、现实意义

1)在项目层面使用高成熟度，可以提高软件产品的质量，提高人员的效率，降低软件开发和维护的成本。对在需求评审阶段发现缺陷及内部测试阶段和验收测试阶段发现的缺陷数据进行了相关分析，发现系统功能性测试覆盖不足、测试轮次较少导致的缺陷密度较高。我们通过相关的改进措施，有效降低了测试的缺陷密度，保证了质量，提升了客户满意度。

2)在组织层面使用高成熟度模型，通过 Hoshin 矩阵工具进行目标分解，最后关键改进过程落实到按时交付和遗留缺陷上面。我们通过敏感度分析和相关的根因分析，识别根本原因，采取行动来提高组织效率和质量。

3)在组织层面通过高成熟度进行系统的学习和讨论，使得我们对组织标准过程体系有了更深入的了解,EPG 给项目提供了相关的性能基线和性能模型，并且通过使用 Minitab、水晶球等相关量化统计分析工具来判断过程是否稳定,确认组织过程改进能否达到预定的目标。
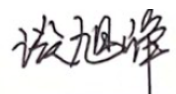
综上所述，评估可以帮助组织提高软件开发和维护的质量，降低成本，提升组织管理能力，提高竞争力，并改善客户满意度，具有非常实际的意义。

四、改进措施

首先，EPG 小组会将本次评估中发现的弱项、问题、建议等，汇总形成改进活动，并在会议上分析讨论和评审，然后向发起人汇报，确定改进的优先级及责任人，制定和跟进执行具体的改进计划。此外，涉及到需要调整的标准过程文件和模板，我们会在下次 EPG 会议上进行评审并发布，同步配置更新到相应的过程资产库中。
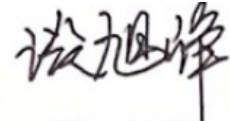
其次，制定详细的的活动步骤、试点计划、推广方案等，发起人组织高层经理、EPG 成员进行研讨改进实施注意事项及潜在障碍和可能风险，向组织申请专项过程改进资金、培训等支持。改进实施过程中，相关人员需要选用恰当的契机先做改进试点，试点反馈有效再逐步复制推广。

最后，EPG 小组会对整个改进过程进行全流程监控，帮助组织专注于关键的改进项目，对改进效果进行度量和量化分析，以便识别改进领域。在此同时，按需对团队进行培训和辅导，使用最佳实践协助提升团队素质，实现更高的质量和更高的业务成功率，不断提升公司的整体竞争力来实现商业目标。

经过此次 CMMI 的顺利进行,是我公司在软件领域的又一次成功突破，显示了公司可以通过信息化、数字化的方式对项目进行管理，利用新技术对流程进行优化，预防企业在项目实施过程中可能出现的问题,进一步提升客户信任度与认可度，为公司在更广阔的市场拓展中起到积极的推动作用。

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。

上海商泰汽车信息系统有限公司

发起人：谈旭峰

2024 年 3 月 17 日

EXECUTIVE SESSION BRIEFING - SPONSOR FEEDBACK

Overall findings

In the current CMMI HM appraisal, the appraisal team was led by HMLA, and they conducted a week-long diligent effort, hosting multiple interviews. Through their extensive experience and professional skills, a comprehensive understanding of our company's implementation of CMMI was achieved. Simultaneously, assistance was provided in conducting a thorough retrospective of our business processes using SPRUM - Systemic Process Review Using Measurements®, an innovation developed as a registered trademark of Raghavan S. Nandyal. The entire certification process provided important insights for decision-making in our company's operations. Following the conclusion of the appraisal, valuable improvement suggestions were provided, aiming to further enhance our operational and managerial levels. A total of 26 improvement suggestions were identified in this appraisal. These suggestions were categorized into four types: engineering management (5), project management (5), support management (8), and process management (8). Following discussions among key roles in the company, including senior managers, the EPG process improvement team, project teams, and support teams, it was unanimously agreed that the identified improvement items highly align with the company's actual situation, with a conformity rate of 100%.

Lessons Learned

From the perspectives of engineering management, project management, support, and process management, summaries were made respectively.
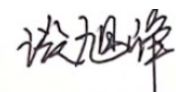
Engineering management

In terms of project quality: greater attention should be paid to the comparative analysis of defects identified before and after delivery. Through comparative analysis, changes in defects and defect density are observed. For example, whether certain issues have occurred before, and whether there are undiscovered problems. If issues that have occurred before resurface, or if previously undetected problems arise, a joint retrospective analysis with requirements, development, and testing personnel is necessary to identify any process gaps, whether due to methodological, personnel capability, experiential, or attitudinal issues. A thorough analysis of these issues facilitates the accumulation of experience and capability enhancement.

During the initial inspection phase, simulate customer usage to further identify detailed issues within the scope of requirements, and to verify the system's status under actual conditions. The testing focus and usage habits of customers may differ from those of testing and development personnel. Through this process, more customer-centric issues are exposed, prompting developers and testers to think from the customer's perspective, gaining better understanding of aspects such as user-friendliness, interface aesthetics, and system usability. In subsequent development and testing phases, developers prioritize not only basic functional usability but also customer experience, thereby enhancing personnel efficiency and capability.

Regarding project requirements: for subsequent projects, efforts will be made to compile scenario flowcharts for each function wherever possible, facilitating understanding of the development requirements' scenarios by relevant stakeholders. This includes strengthening validation, aligning prototype diagrams with functional requirements, and cross-referencing to check for omissions.

In development: adhere strictly to development processes and standards, and control code complexity levels.

Project management

Before project plan documents are drafted, the required personnel skills are planned in advance; training content is developed to understand the skill levels of the trainees for better compliance with job requirements.

Quantitative indicators from the organization's quality monthly report are utilized during project estimation, enhancing estimation accuracy. During requirements and design phase estimation, quantitative indicators such as document page count are increased; during development phase estimation, optimization of current code lines is emphasized; during testing phase estimation, quantitative indicators such as test case count are increased, ensuring granularity of appraisal content and accuracy of estimates.

In monitoring records, solutions to problems, the scope of problem impacts, responsible parties for problem resolution, and problem rectification audit personnel are recorded, ensuring accountability. Tracking of problem points from monitoring records is conducted in every morning meeting and weekly meeting, ensuring timely resolution of problems.

Support

Based on ATMs' suggestions, the EPG team members and senior personnel from relevant engineering fields will be organized to conduct in-depth analysis of our development process, considering relevant processes and data to establish models more suited to our needs. Trials will be conducted in relevant projects to test the effectiveness of these models, followed by analysis. If results meet expectations, promotion will be conducted within the organization. The specific process is as follows:

Data on the current models and workload deviations will be organized and analyzed, and current data will be collected and summarized.
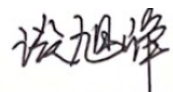
Relevant available models will be collected and summarized, and the usability of models will be discussed in meetings. Suitable models will be selected based on our development process.

The effectiveness of models will be validated, and it will be determined whether the models are suitable for promotion. If suitable, widespread internal use will be implemented within the organization.

Regular summaries and analyses of the effectiveness of models will be conducted, and real-time adjustments and optimizations will be made.

Process Management

Based on HMLA's suggestions, the repository's reusable components will be comprehensively organized, and the content of the reusable library will be enriched. The reuse methods and levels in the repository will be clearly defined, specifying whether it belongs to code reuse or business reuse. Business reuse targets segmented business domains for business entity reuse and business scenarios for business process reuse. As we move from code reuse to business reuse, the level of reuse and the value generated increase, but implementation becomes more complex, and the scenarios where it can be reused become more limited. In subsequent practical work, code-level reuse is relatively straightforward, and our understanding of this aspect is the most extensive. Additionally, due to the widespread adoption of open source, there is a rich selection of middleware available for us to choose from. We can gradually build a technical system suitable for our company based on these resources. Furthermore, we will further organize business middleware and, based on this foundation, develop related business platforms. This will enable us to achieve higher levels of business-level reuse, effectively support the rapid implementation of systems, maximize the value generated by related middleware, and enhance the company's development capabilities.

Relevance

By using high maturity at the project level, software product quality can be improved, personnel efficiency enhanced, and software development and maintenance costs reduced. Relevant analysis was conducted on defects identified during requirements review, internal testing, and acceptance testing stages. It was found that the system had insufficient functional test coverage and a high defect density due to a limited number of test cycles. Through relevant improvement measures, the defect density of testing was effectively reduced, ensuring quality and enhancing customer satisfaction.

At the organizational level, high maturity models were used to decompose goals using Hoshin matrix tools, with key improvement processes ultimately focused on on-time delivery and addressing residual defects. Sensitivity analysis and root cause analysis were conducted to identify fundamental reasons and take action to improve organizational efficiency and quality.
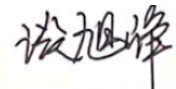
At the organizational level, high maturity was employed for systematic learning and discussion, deepening our understanding of the organizational standard process system. The EPG provided relevant performance baselines and performance models for projects, and quantitative statistical analysis tools such as Minitab and Crystal Ball were used to assess process stability and confirm whether organizational process improvements could achieve the intended goals. All the appraisal outcomes can help organizations improve software development and maintenance quality, reduce costs, enhance organizational management capabilities, increase competitiveness, and improve customer satisfaction, thus holding significant practical significance.

Improvement measures

Firstly, weaknesses, issues, and suggestions identified in this appraisal will be summarized by the EPG team to form improvement activities, which will then be analyzed, discussed, and reviewed at meetings. Subsequently, reports will be made to the initiators, and priorities and responsible parties for improvements will be determined. Concrete improvement plans will be formulated and followed up on. Additionally, any standard process documents and templates requiring adjustment will undergo review and release at the next EPG meeting, with simultaneous configuration updates to the respective process asset repositories.

Secondly, detailed activity steps, pilot plans, and promotion strategies will be formulated. The initiators will organize discussions among senior managers and EPG members to address implementation considerations, potential obstacles, and risks, and to request special process improvement funding and training support from the organization. During the implementation of improvements, relevant personnel will need to opportunistically pilot improvements, and successful pilot feedback will then be gradually replicated and promoted.
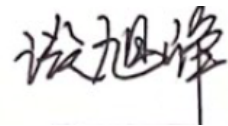
Lastly, the EPG team will monitor the entire improvement process, enabling the organization to focus on key improvement projects. Measurement and quantitative analysis of improvement effects will be conducted to identify areas for further improvement. Simultaneously, training and coaching will be provided to teams as needed, using best practices to enhance team competence, achieve higher quality, and increase business success rates, thereby continuously enhancing the overall competitiveness of the company to achieve business objectives.

The smooth progress of this CMMI appraisal marks yet another successful breakthrough for our company

in the software field. It demonstrates the company's ability to manage projects through information and digital means, optimize processes using new technologies, and prevent potential problems during project implementation. This further enhances customer trust and recognition, playing an actively supportive role in the company's expansion into broader markets.

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.

上海商泰汽车信息系统有限公司

iAUTO (Shanghai) Co., LTD.

Sponsor:　Tan Xufeng

March 17th, 2024