发起人高层会议总结报告

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一、总体发现

通过 CMMI Level 5 范围界定的评估，对软件开发、项目管理、定量管理及过程治理体系进行了全面细致的审查，本次评估采用 CMMI V3.0（开发领域）标准，并结合文档审查、人员访谈与 SPRUM- Systemic Process Review Using Measurements® 方法开展。Raghav 带领团队成员通过文档审查、人员访谈与 SPRUM 量化评审方法，全面审视了公司研发、项目管理、量化管理、过程治理及全生命周期工程实践。评估精准识别出组织在量化建模、人员胜任力、过程资产、多领域适配、代码工程、测试验证、缺陷管控、配置管理、高层治理及持续改进等方面的关键问题与改进空间，形成了贴合业务实际、兼具专业性与可操作性的改进指引。

在与您的深入交流中，我们获得了高成熟度落地的关键指导，为组织长期能力升级奠定基础。公司管理层、EPG、项目经理及质量、数据、配置管理核心团队对评估发现充分研讨并达成共识，一致认可本次评估结果客观务实，对推广量化管理、优化过程体系、提升交付质量具有重要价值。我们将以本次评估为契机，系统吸收评估成果，制定可落地的改进计划，全面推进过程规范化、量化管控与持续改进，稳步提升组织成熟度与市场竞争力。

二、经验教训

本次评估从工程实践、项目管理、支持保障、过程治理四个维度形成系统性经验总结。在量化建模与效能管理方面，总生产力模型虽纳入需求开发与代码审查相关因子，但两类因子分属开发与验证范畴且缺乏相关性，提升开发效能易对验证环节造成延迟影响，二者正向作用难以合理解释，模型稳定性与准确性有待深入验证；需求开发生产力依赖反馈时效与问题关闭速度建模，易受特殊原因波动干扰，可控性不足，未能充分立足人员胜任力、需求稳定性、需求获取方法等内部可优化因素开展量化设计。缺陷逃逸率分析仅聚焦需求监控与代码审查缺陷密度，两类因子影响微弱，未能全面评估各阶段注入缺陷的真实影响，难以实现精准缺陷遏制。

在工程实现与质量验证环节，代码逻辑与结构规范性不足，布尔变量初始化与判断逻辑冗余降低可读性，if 语句缺少必要 else 分支，单行指令未规范使用大括号包裹，易导致测试路径遗漏与代码未经充分验证，进而引发现场返工与不必要成本消耗。测试用例设计未能完整覆盖信息块执行路径，对代码规范缺陷引发的验证风险识别不足。过程质量保证审核对全生命周期缺陷密度的共同原因与特殊原因未做区分管控，两类变异混为一谈导致可控与不可控因素界定不清，直接影响审核有效性与改进针对性。

在组织能力与人才发展层面，量化统计管理能力集中于 EPG 与项目经理，分析、开发、测试及 QA 等核心执行角色未纳入系统性培训，量化能力覆盖不足；业务目标权责未下沉至全员，仍局限于过程改进团队主导，难以形成自上而下的量化执行共识。现有培训偏战术层面，未结合多模型、多领域实施规划开展战略级培训设计，风险与机会评估也未充分联动内部胜任力发展计划，难以支撑长期能力升级。

在配置管理与过程资产方面，配置管理重心停留在产出物归档，缺乏以发布为目标的配置项主动识别与演进机制，易遗漏关键工程资产。过程资产仍带有明显 V2.2 特征，未充分对标 V3.0 模型差异开展架构升级，高成熟度实践视角与落地适配性不足。决策分析应用局限于技术方案选型，未在项目全流程围绕效能提升、周期缩短、缺陷遏制等量化业务目标开展综合评估。

在多领域适配与战略规划上，当前仅依托开发领域实施，未结合物料管理、水务公用事业等业务场景拓展 DATA、Safety、Security 及 SVC 等 CMMI V3.0 扩展领域，难以支撑未来业务扩展与服务类需求交付；最终用户需求挖掘与分析不足，难以匹配多元化客户场景。高层量化治理未覆盖多领域协同实施框架，未纳入人员、安全及 AI 扩展维度，限制了研发与测试活动的整体精简提效空间。

三、现实意义

本次 CMMI 5 高成熟度评估与改进，对组织实现高质量发展具有关键支撑作用。通过优化量化建模逻辑、区分变异原因、完善因子设计，可实现效能与质量协同可控，提升数据决策可靠性；通过规范代码工程与测试验证体系，减少隐性缺陷与现场返工，提升产品稳定性与可维护性。

通过构建全员覆盖的量化能力培训体系，打破角色壁垒、下沉业务目标权责，可形成组织级量化执行文化，支撑高成熟度实践全面落地。升级配置管理模式、更新 V3.0 适配的过程资产，能够补齐工程资产治理短板，保障研发、测试与发布流程连贯可控。

拓展 CMMI V3.0 多领域实践，可更好适配数据管理、服务交付、安全合规等业务延伸需求，支撑水务、仓储物料计划等场景长期演进。完善高层量化治理与决策分析闭环，能够实现全生命周期过程管控与战略对齐，提升资源配置效率与持续改进能力，最终以过程成熟度驱动交付质量、客户满意度与市场竞争力全面提升。

四、改进措施

评估结束后，EPG 将联合各业务团队开展差距分析，形成系统化改进方案与实施计划，明确节点、责任与量化目标，由公司高层提供全要素资源保障，确保改进落地见效。

我们将全面优化量化建模体系，重新梳理生产力模型因子逻辑，分离开发与验证相关维度的相关性影响，深入验证模型合理性；将需求开发效能建模转向人员胜任力、需求稳定性、需求工程方法等内部可控因子，降低特殊原因波动干扰。同时完善缺陷逃逸率分析框架，全面纳入各阶段缺陷注入影响，建立全流程缺陷溯源与遏制机制。在过程质量保证中明确区分共同原因与特殊原因变异，实施分类管控与精准改进，提升审核有效性与过程稳定性。

针对代码工程与测试验证，统一编码规范，优化布尔变量初始化与逻辑判断写法，强制完善 if-else 结构与大括号使用规则，提升可读性与可测性；健全测试用例路径覆盖机制，避免因代码不规范导致测试遗漏，从源头减少现场验证问题与返工成本。

在组织能力建设方面，打造覆盖分析、开发、测试、QA 等全角色的量化统计培训体系，将统计方法与量化思维下沉至执行层，明确全员业务目标权责，构建组织级量化执行文化。同步制定战略级培训规划，对接多模型、多领域实施需求，在风险与机会评估中充分联动胜任力发展计划，保障长期能力供给。

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升级配置管理模式，建立以发布为核心的配置项主动识别与持续演进机制，确保开发测试过程关键资产不遗漏。全面梳理 CMMI V2.2 与 V3.0 差异，更新过程架构与资产库，使过程体系完全适配高成熟度实施要求。扩展决策分析应用范围，在项目全周期围绕效能、周期、缺陷遏制等量化目标开展多维度评估，充分释放决策分析价值。

面向业务长期发展，逐步引入 DATA、Safety、Security、SVC 等 CMMI V3.0 扩展领域，适配物料计划、水务公用事业服务等场景需求，补齐需求工程中最终用户挖掘环节。完善高层量化治理框架，将人员、安全、AI 扩展等维度纳入治理体系，推动多领域协同实施，实现研发测试活动精简高效。EPG 将全程跟踪改进执行，选取试点验证成效，.经量化评估后在组织内全面推广，持续沉淀改进成果为组织资产，实现高成熟度能力闭环提升。

我们衷心感谢评估团队的专业指导，将以坚定决心推进各项改进，持续提升研发管理与产品交付水平，为客户创造更高价值，实现长期稳健发展。

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EXECUTIVE SESSION BRIEFING: SPONSOR FEEDBACK

Overall findings

Through the CMMI Level 5 Scoped Appraisal, a comprehensive and meticulous review was conducted on the software development, project management, quantitative management, and process governance systems. This appraisal adopted the CMMI V3.0 (Development) standard, utilizing a combination of document reviews, personnel interviews, and the SPRUM—Systemic Process Review Using Measurements® methodology. Led by Raghav, the team thoroughly examined the company's R&D, project management, quantitative management, process governance, and full-lifecycle engineering practices. The assessment precisely identified key issues and areas for improvement in quantitative modeling, personnel competency, process assets, multi-domain adaptation, code engineering, test verification, defect control, configuration management, high-level governance, and continuous improvement, forming improvement guidelines that are professionally rigorous, operationally feasible, and closely aligned with actual business needs.

Through in-depth exchanges, we gained critical guidance on the implementation of High Maturity practices, laying a solid foundation for the organization's long-term capability upgrades. The company's management, EPG, project managers, and core teams in quality, data, and configuration management fully discussed and reached a consensus on the findings, unanimously agreeing that the appraisal results are objective and pragmatic, and of significant value for promoting quantitative management, optimizing process systems, and enhancing delivery quality. We will leverage this appraisal as an opportunity to systematically internalize the results, formulate actionable improvement plans, and comprehensively advance process standardization, quantitative control, and continuous improvement to steadily enhance organizational maturity and market competitiveness.

Lessons Learned

Through the four dimensions of Engineering Practice, Project Management, Support & Assurance, and Process Governance, the following systematic summary of findings has been established:

In terms of Quantitative Modeling and Performance Management, while the Total Productivity Model incorporates factors related to requirements development and code review, these factors belong to the development and verification domains respectively and lack significant correlation. Increasing development efficiency may inadvertently cause delays in the verification phase, making the positive interaction between the two difficult to explain logically; thus, the stability and accuracy of the model require further validation. Requirements development productivity modeling currently relies on feedback timeliness and issue closure speed, which are susceptible to fluctuations caused by special causes and lack controllability. The quantitative design has not sufficiently focused on internal optimizable factors such as personnel competency, requirements stability, and elicitation methods. Furthermore, defect leakage rate analysis focuses only on requirements monitoring and code review defect density. These factors have a weak impact and fail to comprehensively assess the true influence of defects injected at various stages, making precise defect containment difficult to achieve.

In the Engineering Implementation and Quality Verification phases, there is insufficient standardization in code logic and structure. Redundant initialization and judgment logic for Boolean variables reduce readability, while if statements lacking necessary else branches and single-line instructions not enclosed in braces lead to missed test paths and insufficiently verified code. This, in turn, triggers field rework and unnecessary costs. Test case design fails to fully cover execution paths of information blocks, with inadequate identification of verification risks caused by code specification defects. Process Quality Assurance (PQA) audits do not distinguish between common and special causes of defect density across the full lifecycle. Mixing these two types of variation leads to blurred boundaries between controllable and uncontrollable factors, directly impacting audit effectiveness and the specificity of improvements.

Regarding Organizational Capability and Talent Development, quantitative statistical management capabilities are concentrated within the EPG and Project Managers. Core execution roles—such as analysts, developers, testers, and QAs—have not been included in systematic training, leading to insufficient coverage of quantitative skills. Responsibility for business objectives has not been cascaded to all staff and remains dominated by the process improvement team, making it difficult to form a top-down consensus on quantitative execution. Existing training is primarily tactical and lacks strategic design aligned with multi-model and multi-domain implementation plans. Additionally, risk and opportunity assessments are not fully linked with internal competency development plans, hindering long-term capability upgrades.

In Configuration Management and Process Assets, the focus of configuration management remains on the archiving of deliverables, lacking a proactive identification and evolution mechanism for configuration items (CIs) aimed at release, which leads to the omission of key engineering assets. Process assets still exhibit distinct V2.2 characteristics and have not undergone an architectural upgrade to align with V3.0 model differences, resulting in a lack of high-maturity practice perspectives and field adaptability. The application of Decision Analysis and Resolution (DAR) is limited to technical solution selection and has not been utilized throughout the project lifecycle to conduct comprehensive evaluations centered on quantitative business goals such as efficiency enhancement, cycle-time reduction, and defect containment.

Regarding Multi-domain Adaptation and Strategic Planning, implementation is currently relied solely on the Development domain. There is a lack of expansion into CMMI V3.0 extended domains—such as DATA, Safety, Security, and SVC—in conjunction with business scenarios like material management and water utilities, which limits support for future business expansion and service-related delivery. The elicitation and analysis of end-user requirements are insufficient to match diversified customer scenarios. High-level quantitative governance does not cover a multi-domain collaborative implementation framework and excludes personnel, safety, and AI expansion dimensions, thereby restricting the overall space for streamlining and improving the efficiency of R&D and testing activities.

Relevance

This CMMI 5 high-maturity appraisal and subsequent improvements play a pivotal role in supporting the organization's high-quality development. By optimizing quantitative modeling logic, distinguishing between types of variation, and refining factor design, the organization can achieve synergistic control over efficiency and quality while enhancing the reliability of data-driven decision-making. Standardizing code engineering and testing verification systems will reduce latent defects and field rework, thereby improving product stability and maintainability.

Building a comprehensive quantitative capability training system that covers all staff will break down role barriers and cascade responsibility for business objectives. This will foster an organization-wide culture of quantitative execution, supporting the full implementation of high-maturity practices. Upgrading configuration management models and updating process assets to align with V3.0 will address gaps in engineering asset governance, ensuring that R&D, testing, and release processes remain continuous and controllable.

Expanding CMMI V3.0 multi-domain practices will better accommodate extended business requirements such as data management, service delivery, and safety compliance, supporting the long-term evolution of scenarios like water utilities and warehouse material planning. Finally, perfecting the closed-loop of high-level quantitative governance and decision analysis will enable full-lifecycle process control and strategic alignment. This enhances resource allocation efficiency and continuous improvement capabilities, ultimately leveraging process maturity to drive overall improvements in delivery quality, customer satisfaction, and market competitiveness.

Actions to be taken

Following the appraisal, the EPG will collaborate with various business teams to conduct a gap analysis and formulate a systematic improvement plan. This plan will define specific milestones, responsibilities, and quantitative objectives, with senior management providing full-spectrum resource support to ensure the improvements yield tangible results.

We will comprehensively optimize the quantitative modeling system by restructuring the logic of productivity model factors, separating the correlation between development and verification dimensions, and thoroughly validating model rationality. Requirements development modeling will pivot toward internally controllable factors—such as personnel competency, requirements stability, and requirements engineering methods—to reduce interference from special-cause variations. Simultaneously, the defect leakage analysis framework will be enhanced to fully incorporate the impact of defect injection at all stages, establishing a full-process defect traceability and containment mechanism. In process quality assurance, we will clearly distinguish between common-cause and special-cause variations, implementing categorized controls and precision improvements to enhance audit effectiveness and process stability.

Regarding code engineering and testing verification, we will unify coding standards, optimize Boolean variable initialization and logic, and mandate the completion of if-else structures and the use of braces to improve readability and testability. We will also strengthen the path coverage mechanism for test cases to prevent testing omissions caused by non-standard code, reducing field verification issues and rework costs at the source.

In terms of organizational capability building, we will create a quantitative statistical training system covering all roles—including analysis, development, testing, and QA—to push statistical methods and quantitative thinking down to the execution level. By clarifying business objective responsibilities for all staff, we aim to build an organization-wide quantitative execution culture. Concurrently, a strategic training roadmap will be developed to align with multi-model and multi-domain implementation needs, fully linking risk and opportunity assessments with competency development plans to secure long-term capability supply.

We will upgrade the configuration management model by establishing a release-centric mechanism for the proactive identification and continuous evolution of configuration items, ensuring no critical assets are missed during the R&D and testing process. We will also conduct a thorough review of the differences between CMMI V2.2 and V3.0, updating the process architecture and asset library to ensure full alignment with high-maturity implementation requirements. The application of Decision Analysis and Resolution (DAR) will be expanded to include multi-dimensional evaluations centered on quantitative goals such as efficiency, cycle time, and defect containment throughout the project lifecycle.

To support long-term business growth, we will progressively introduce CMMI V3.0 extended domains, including DATA, Safety, Security, and SVC, to adapt to scenarios such as material planning and water utility services, while addressing gaps in end-user elicitation within requirements engineering. The high-level quantitative governance framework will be refined to incorporate dimensions such as personnel, safety, and AI extensions, promoting collaborative implementation across multiple domains to achieve streamlined and efficient R&D and testing activities. The EPG will track improvement execution throughout, selecting pilots to verify effectiveness before full-scale organizational rollout, ensuring that improvement outcomes are continuously institutionalized as organizational assets to achieve a closed-loop elevation of high-maturity capabilities.

We sincerely appreciate the professional guidance of the appraisal team and are committed to advancing these improvements with firm determination. We will continue to elevate our R&D management and product delivery standards to create higher value for our customers and achieve long-term, stable growth.

I hereby authorize and agree that you and SITARA Technologies may share our evaluation results on SITARA's publishing channels and promote them as deemed appropriate by SITARA Technologies.

Sanchuan Wisdom Technology Co., Ltd.
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