发起人高层会议总结报告

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Dear Raghav Nandyal:

一、总体发现

联通（河南）产业互联网有限公司**本次选用 CMMI V3.0（开发域）标准**，基于评估团队，通过系统化的文档审查、深度访谈及全流程诊断，全面梳理了软件工程与项目管理的标准化实践。这既加深了公司对 CMMI 国际标准的理解，又为公司发展起到诸多积极推动作用。**HMLA Raghav Nandyal 领导的团队**精准洞察潜在问题，凭借深厚的专业知识为开发团队提供了切实可行的效率提升优化建议。在审查过程中，不仅要焦软件研发流程，还对业务流程和管理方式进行了全面审视，**以实现赞助目标，使用名为 SPRUM 的专有战略管理工具，使用 Measurements® Systemic Process Review Using Measurements - SPRUM®（Raghavan S. Nandyal 的注册商标）进行系统流程审查，以获得更深入的见解"如何以可靠的测量指标为重点，提高高成熟度流程的有效性并使其实用化"**。通过基于过程性能基线的量化分析技术，精准识别了高成熟度流程在执行层面的效能瓶颈，为优化措施提供了数据支撑。本次评估不仅强化了团队对量化管理机制的掌握，更通过根本原因分析构建了持续改进闭环，为企业效能提升指明了实施路径。

二、经验教训

在实践 CMMI5 高成熟度过程改进的过程中，我们深刻体会到其对组织能力的系统性提升作用。通过引入 CMMI5，我们不仅掌握了标准化的项目管理方法，还形成了一种以数据驱动、持续优化为核心的工作思维。这种改进不仅覆盖了需求分析、设计开发、测试交付等全生命周期，还通过量化管理和过程优化，为组织的长期发展提供了强有力的支撑。

在评估过程中，我们吸取了一些经验教训。编写代码的时候，要注意返回前端的变量（特别是涉及列表时）的命名，这些命名应该更加直观，含义更加明确，例如，将 return returnInfo 或 return returnObject，改成 return InstitTransferInfo 或 return institTransfOb;，明显可以提高代码的可读性和可维护性，让后来的人能通过变量命名准确的明白变量的含义，这样也让代码的结构更清晰和明确。为此，我们会从以下几个方面进行实施：

1. 制定代码开发规范，将规范以文档形式确定下来，并向成员培训和强调变量命名的规范要求，并要求强制执行。
2. 代码审查：在代码评审时，将变量命名作为必审项，并重点关注前后端返回值变量。
3. 集成静态代码分析：引入相应的静态分析工具，自动检出命名不符规范的代码，并给出警告。
4. 长期坚持：通过长期坚持规范开发和代码审查，让这种习惯成为团队成员的本能。

从 QA 检查清单来看存在两个问题。一是检查内容规划重复，不同阶段或模块的检查内容大量相似甚至相同，QA 人员需重复检查，浪费工作量。二是检查项设定是描述模糊、界定不清，缺乏明确的标准，难以判断是否完成，影响检查结果准确性与可靠性。

我们会从以下几个方面进行实施：

1. 对用于验证各生命周期阶段工作活动的检查清单进行全面梳理与重新编排，确保清单内容理

辑清晰、条理分明，能够精准覆盖各阶段关键工作要点。

2. 在后续项目正式启动前，组织项目团队成员开展检查项的专项研讨工作，对现有检查项进行合理删减与精准确认，保证检查项既符合项目实际需求，又具备可操作性与有效性。

3. 构建一套完善的检查清单反馈机制，定期向项目团队反馈检查项的完成进度与质量情况。同时，针对后续检查项进行再次确认与动态调整，以此保障检查清单始终保持实时有效状态，切实提升 QA 工作的实际价值。

三、改进措施

谨向 Raghav Nandyal 先生及其评估团队致以诚挚谢意。针对评估发现的问题项，我们将组建高层督导的专项改进小组，构建四维管控机制（问题识别-措施制定-责任分配-时限管控），每月编制《改进进度报告》并同步纳入组织过程资产库版本管理，确保改进经验可追溯、可复用。

在推进 CMMI5 高成熟度改进实践中，我们构建了分阶段实施路径：短期（0-6 个月）聚焦评审机制优化，建立需求跟踪矩阵与设计评审检查单体系，通过需求-设计追溯矩阵强化双向追溯能力，将设计偏离需求导致的返工率降低 40%以上，为项目基线建立提供质量保障。中期（6-12 个月）实施量化过程管理，运用统计过程控制技术建立组织级过程性能基线，通过模拟预测项目风险，结合控制图实时监控关键过程指标，同步构建包含 200+历史项目数据的量化决策知识库。长期（1-3 年）推进智能优化转型，开发基于 AI 的过程智能监控平台，集成需求变更影响分析与缺陷模式识别算法，通过自动化测试框架与持续集成流水线实现缺陷预防率提升 60%，构建覆盖需求、设计、开发全链路的数字化能力成熟度模型。

为确保改进战略有效落地，我们构建了闭环管理机制：每月举行跨部门改进联席会议，实施过程资产复盘与问题溯源，同步制定《过程改进路线图》：每季度开展量化成熟度评估，通过过程性能基线比对识别关键差距，运用预测模型动态调整改进优先级。目前已建立过程性能指标监控体系，将 CMMI5 实践深度融入数字化能力成熟度建设，形成知识沉淀与复用机制，驱动组织效能持续提升。

作为本次评估的发起人，并已收到执行会议简报，我特此授权并同意您与 SITARA Technologies 在 SITARA 的发布渠道上分享我们的评估成果，并根据 SITARA Technologies 的判断，公开我们的评估成果。

联通（河南）产业互联网有限公司

发起人：张波

2025 年 12 月 06 日

EXECUTIVE SESSION BRIEFING - SPONSOR FEEDBACK

Overall findings

UNICOM (HENAN) INDUSTRIAL INTERNET CO., LTD. selects the CMMI V3.0 (Development) model for this appraisal; through a systematized review of documents, in-depth interviews, and an end-to-end diagnostic by the appraisal team, the standardized practices of software engineering and project management are comprehensively sorted out. By deepening the company's understanding of international CMMI standards, the appraisal acts as a strong driver for organizational development. Under the leadership of HMLA Raghav Nandyal, the team provides accurate insights into potential issues and, with profound professional expertise, offers practical suggestions for efficiency improvement to the development team. During the review, not only the software R&D workflow but also business processes and management approaches are examined in a comprehensive way.

To achieve the sponsorship objectives, a proprietary strategic management tool named SPRUM is adopted; the Systemic Process Review Using Measurements – SPRUM® (a registered trademark of Raghavan S. Nandyal) is used for system-level process examination, so that deeper insights may be obtained into "how the effectiveness of high-maturity processes is improved and operationalized through the focus on reliable measures." By means of quantitative analysis based on process performance baselines, bottlenecks of effectiveness in high-maturity process execution are accurately identified, and optimization measures are supported by data. The appraisal not only enhances the team's mastery of quantitative management mechanisms but also, through root cause analysis, establishes a closed loop for continuous improvement and provides a clear path for organizational performance enhancement.

Lessons Learned

Throughout the implementation of CMMI Level 5 high-maturity process improvement, the organization experiences its systematic strengthening of organizational capability. By introducing CMMI Level 5, standardized project management methods are mastered, and a mindset centered on data-driven and continuously optimized work is cultivated. By covering the entire lifecycle—from requirements analysis, design and development to testing and delivery—and by reinforcing quantitative management and process optimization, strong support is provided for the organization's long-term development.

During the appraisal, several lessons are learned. While writing code, attention needs to be paid to naming variables that are returned to the front end (particularly those involving lists). These names should be more intuitive and meaningful. For example, instead of writing return returnInfo or return returnObject, using return institTransferInfo or return institTransfObj significantly improves code readability and maintainability. Through proper naming, subsequent developers can accurately understand the meaning of the variables, and the structure of the code becomes clearer and more explicit. To address this, implementation is planned from the following aspects:

Establishing coding standards: the standards are documented, and training is delivered to team members to emphasize naming rules, with enforcement required.

Code review: variable naming is included as a mandatory review item, with special attention placed on returned variables between the front and back ends.

Integrating static code analysis: appropriate static analysis tools are introduced to automatically detect non-compliant names and raise warnings.

Long-term adherence: through continuous compliance with standards and code review, the habit of proper naming becomes ingrained in the team.

From the QA checklist, two issues are identified. First, the planned inspection items are repetitive; similar or identical items appear across different stages or modules, requiring QA staff to perform repeated checks and causing unnecessary workload. Second, the inspection descriptions are vague and poorly defined, lacking explicit criteria and making it difficult to determine completion, which affects the accuracy and reliability of QA results.

Implementation will proceed from the following aspects:

Comprehensively reorganizing the checklists used for verifying activities in each lifecycle stage, ensuring logical clarity and precise coverage of key points.

Conducting dedicated workshops before formal project kickoff, during which project team members refine, adjust, and confirm inspection items to ensure practicality, operability, and effectiveness.

Establishing a complete checklist feedback mechanism, through which progress and quality are periodically communicated, and through which iterative confirmation and dynamic adjustment of inspection items are performed, ensuring the checklist remains timely, effective, and valuable for QA work.

Improvement Actions

Sincere appreciation is extended to Mr. Raghav Nandyal and the appraisal team. Regarding the identified issues, a special improvement taskforce led by senior management is to be established. A four-dimensional control mechanism—issue identification, action formulation, responsibility allocation, and timeline control—is to be constructed. A monthly Improvement Progress Report is to be issued and incorporated into organizational process assets under version control, ensuring that improvement experience is traceable and reusable.

In advancing CMMI Level 5 high-maturity improvements, a phased implementation roadmap is built.

Short-term (0–6 months): focus is placed on strengthening review mechanisms, establishing requirement traceability matrices and design review checklists, and enhancing bidirectional traceability through requirement-design linkage. By reducing rework caused by design-requirement deviations by more than 40%, quality assurance for project baselines is reinforced.

Mid-term (6–12 months): quantitative process management is implemented; organizational process performance baselines are established through statistical process control. Project risks are predicted through simulation, key indicators are monitored in real time via control charts, and a quantitative decision knowledge base with more than 200 historical projects is developed.

Long-term (1–3 years): intelligent optimization transformation is pursued. An AI-based intelligent process monitoring platform is developed, integrating requirement-change impact analysis and defect-pattern recognition algorithms. Through automated testing frameworks and CI pipelines, defect prevention rates are increased by 60%, and a digital capability-maturity model covering requirements, design, and development is constructed.

To ensure the effective implementation of the improvement strategy, a closed-loop management mechanism is built. Monthly cross-department improvement meetings are held to conduct process-asset reviews and root-cause tracing, and the Process Improvement Roadmap is formulated in parallel. Quarterly quantitative maturity appraisals are performed; gaps are identified through process-performance-baseline comparison, and improvement priorities are dynamically adjusted via predictive models. At present, a process-performance indicator monitoring system has been established, deeply integrating CMMI Level 5 practices into digital capability-maturity construction, enabling knowledge accumulation and reuse, and continuously driving organizational performance improvement.

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.

UNICOM (HENAN)INDUSTRIAL INTERNET CO., LTD.

Sponsor: Zhang Bo

Dec 06, 2025