

Journey from ISO 9001 to SW CMM Level 5

(A Two Stage Journey Experience)

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1. Introduction

Syntel (India) Ltd., hereinafter referred to as Syntel, is a software export organization having centres in Mumbai and Chennai. Syntel is a wholly owned subsidiary of Syntel Inc., USA.

Syntel was certified for ISO 9001 in June 1998. As most of the clients in USA readily acknowledge SW CMM (Software Capability Maturity Model of SEI) as a quality model, it was felt appropriate to quickly get assessed for SW CMM. Also, with revision of ISO 9000 standard not in sight in 1998, the SW CMM became more appropriate from business point of view, than the ISO 9001 standard. Hence, in the second half of 1998 Syntel decided to get assessed for SW CMM.

It was felt that reaching the goal of Level 5 would take at least 2 years. Preparing the organization to take this leap in a huge time frame of over 2 years did not make business sense and hence a two-stage approach was considered. The options were to go in for either Level 4 or Level 3 as the first target, thus allowing the quality processes to be implemented in stages and gaining maturity over a period of time.

The stages were finalized only after getting an insight of the SW CMM and weighing the pros and cons of getting assessed for Level 4 and then Level 5, vis-à-vis, first Level 3 and thereafter Level 5. The decision to go for Level 3 in the first stage was taken up after a study and analysis of SW CMM for couple of months.

2. Requirement and Solution

It was essential to get assessed for Software CMM to remain competitive in the international market, in particular in USA market.

The goal was to achieve Level 5 of SW CMM. Since it would have taken a substantial time frame of over 2 years to get directly assessed for Level 5, Syntel decided to achieve this goal in two stages. First getting assessed for a lower level in the first stage in much less than 2 years and then going for Level 5 in the second stage.

In the process of studying and understanding SW CMM, some areas were identified to leverage the SW CMM requirements to implement quality processes that would add value to the organization. In the process, a few value additions were made. Some of which are given below.

- *Senior project persons doing SQA (Software Quality Assurance) activity*

These persons would do this activity on a part time basis and report on quality health of the project periodically. They would also be useful in providing the project managers with consultations and guidance from their experience. This was expected to add substantial value in terms of having the SQA persons sharing project and technology experience with the project managers and acting as eyes of the management for early warning signals. The SQA person, though not having that project's delivery responsibility, would have the shared responsibility for quality of the software developed. His job would be to help the PM in maintaining the software quality and in case of signals indicating any problem, provide the PM with guidance to overcome it and raise alarm to the management. This was expected to expedite the preventive and corrective actions in that project and also sharing of such experiences with other projects.

- *New processes would be piloted in projects*

Before implementing processes across the organization, pilots in a couple or more projects would be carried out. Though this could result in some delay in implementing the processes across the organization, it would help if inevitable changes to new processes come up during the pilot and not during organization wide implementation. In case of pilots, the changes that come about would impact a relatively smaller group carrying out the pilot and could be taken care of before the company wide implementation.

After gaining an in-sight into all levels of SW CMM and their requirements, it was decided to go in for L3 in the first stage and thereafter to go in for L5.

Also, some groundwork for the second stage was started in the first stage, such as:

- Automation of process data
- Formal defect analysis in some projects (L5)
- Definition and collection of metrics for quantitative management (L4)

3. Stage 1 : Level 3 Assessment

Syntel had processes defined and validated for ISO 9001 in 1998. But there was no SW CMM experience in the company. A task force was formed to study the KPAs (Key Process Areas) of SW CMM and arrive at gaps between the current processes and the SW CMM requirement. These gaps were reviewed and then used to create new processes and upgrade some of the existing processes.

At this point consultancy services were contracted to validate the processes and ensure that the CMM requirements are met and also, that the interpretation of SW CMM made by the task force is correct and complete.

Along with having senior project persons working as SQAs on part-time basis and piloting new processes before organization-wide implementation, a few other decisions were taken:

- *Experienced project persons were identified as prospective ATMs*

Assessment Team Members (ATMs) were a mix of senior software and quality persons. This was expected to help the senior project persons from the assessment team gain insight into the SW CMM model and its assessment process. This was also seen as an advantage since the information would percolate down from the managers to the project teams and laterally to some other project managers.

- *Internal audit function of ISO 9001 and SQA function of SW CMM kept operational.*

The SQA function, apart from checking process compliance, was given additional responsibility of checking the quality health of the project and give guidance to the PM.

- *Peer Reviews*

These were encouraged for all coding and unit testing activities. This added value, especially to large maintenance projects, as the peers gained application knowledge faster. Earlier the Project/Module Leader used to carry out most of the reviews.

4. Stage 2 : Level 5 Assessment

The stage 1 gave good experience of defining and implementing processes as required by Levels 2 & 3 of SW CMM. That was very useful when the processes were defined for the other two levels.

The full organization was directly or indirectly involved in the Level 3 assessment. It gave the organization a feel of the assessment process, and gave the project persons better appreciation of the quality function, especially from the participation of senior project persons as Assessment Team Members. The assessment process forced improved learning of all the phases of project execution, roles of support functions and SEPG in the organization.

More active involvement was achieved in the stage 2 by forming boards for L4 and L5 processes with senior, experienced project persons as board members. The responsibilities of the boards were defined and some of the SEPG functions, limited to the respective KPA requirements, were transferred to the boards. There were 4 boards defined, one for Level 4 (Quantitative Management Board) and one each for the 3 KPAs of Level 5 (DP Board, TCM Board, PCM Board).

The boards defined the respective processes for Levels 4 & 5 and participated in their implementation. This helped in faster implementation and better appreciation of these processes by project teams, as board members were senior project persons who had direct influence over the project teams.

5. Salient Points

What drove the decision to go for Level 3 in the first stage and not Level 4?

Level 4 needs mature data to be analyzed for several months. It is essential to capture process data accurately and use for metrics compilation. This could be achieved by complete automation to ensure data consistency. Going for level 4 could have meant some delay in getting assessed and that could further delay the subsequent Level 5 assessment. This would mean that the total time line for both assessments would be longer than possibly for first going for Level 3, while simultaneously making some progress in automation and collecting data needed for level 4, and then going for Level 5.

What were other advantages planned?

Piloting formal defect analysis (and prevention) gave a head start to the Level 5 KPA on Defect Prevention. This gave more comfort in going for Level 5 assessment in stage 2. The SQA persons and internal auditors were required to report good practices in projects that could lead to standard process for Syntel. At the same time, the project teams were encouraged to come up with improved ways of doing work and take pride in reporting it back to the SEPG, who would consider these for inclusion in the standard processes.

What was done differently?

SQA function was given to practicing project managers/leaders on part-time basis. They would be having their own project to manage, but they would be doing SQA work for another project. This added value to the projects by providing the project managers with guidance of experienced peers. These peers were respected, since they were currently project managers of another project. Also it provided a mechanism for routine, external check on project quality. The SQA persons participated in the reviews of metrics and defect analysis. This gave another dimension to the review process.

How was early acceptance for new processes obtained?

Boards, having members from projects, defined the Level 4 and 5 processes and guided their implementation. These boards covered a sizable portion of senior project persons. This created involvement of multiple projects right from the beginning, which resulted into faster acceptance of new processes by all projects. Also these processes were piloted before full-fledged implementation. The feedback from pilot was used to improve the processes. Hence the implementation was smooth, which helped in avoiding resistance due to successive process changes.

6. Epilogue

Looking back at the journey, there could have been alternative and better ways of achieving the goal perceived by Syntel two years back. However, any attempt to collapse the schedule could have resulted into unsatisfactory implementation, defeating the purpose of having a good quality system.

Strong, user friendly automation, plenty of process guidelines to ensure uniformity of process usage, switching to fortnightly periodicity, rather than monthly for analyzing process data are some useful ideas that come to mind.

Another area is that of ISO 9000:2000, which has a substantial improvement over the 1994 standard. This got released only a few days before the year 2000 ended. But one could have used the draft version of it to simultaneously upgrade the processes to get ready for ISO 9000:2000.

Overall, the experience and outcome of this journey is satisfactory. The business goal was achieved partially in stage 1. The stage 2 assessment is scheduled in March 2001. Hopefully that would confirm the requisite process maturity and set the scenario for another journey on quality path using some other reference model or standard.