

Software Process Improvement in Thailand

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Abstract

Thailand has realized the need to create software industry since the first computer was brought in the country. In 1986, NECTEC was founded to act as a funding agency for university research in electronic and computer technology. Later, NECTEC was assigned responsibilities to promote the use of ICT in the public sector, establishing the Software Park Thailand, drafting ICT laws for the Cabinet, as well as collaborating with the Thailand Institute for Industry Standards in developing several ICT standards. Software Park Thailand became a transition partner of the Software Engineering Institute and promoted the use of SW CMM and CMMI in Thai software companies. In 2002, the Cabinet approved the establishment of Software Industry Promotion Agency (SIPA) as a public organization within the Ministry of Information Technology and Communication. SIPA funded a group of software experts to create a new standard – Thai Quality Software (TQS) for use in very small software enterprises. TQS is now further modified to align with the new ISO 29110 standard.

Key Words: Software process improvement, CMMI, TQS, ISO 29110,

1. Introduction

Thailand started to use computers in data processing around 1960. The first applications were in the census survey and statistical analysis. Programs in those days could only produce reports in English language which is not an official language in the country. Thailand, therefore, realized the need to develop software which could handle Thai characters as inputs as well as having an ability in producing reports in Thai language. Later a group of IBM experts developed a set of Thai character code in EBCDIC and devised a scheme to print Thai characters on line printers. Reports printed in this scheme were not well accepted because of the unpleasing appearance which was unnatural to the

way Thai characters are normally typed. Solutions on IBM minicomputers and mainframes were not simple and people realized that more research work need to be done in software development.

On September 16, 1986 Thai cabinet approved a request from the Ministry of Science, Technology and Environment to establish a research organization within the ministry. At that time, this organization was only a special project and later transformed into a specialized national center under the National Science and Technology Development Agency (NSTDA), a new agency following the enactment of the Science and Technology Development Act of 1991. This new center was named the National Electronic and Computer Technology Center or NECTEC [1].

NECTEC early roles were inevitably broad from research in hardware and software to training, consultancy and software development. Later, new roles were assumed when more deficiency in ICT was identified. NECTEC was named a secretariat office of the new National Information Technology Committee appointed by the Cabinet. The agency was given also a duty to draft several ICT laws of which a few have been enacted. Moreover, the agency participated in developing a few national ICT standards in collaboration with Thai Industrial Standard Institute. In the field of hardware, NECTEC advised the Government to invest in establishing a wafer fabricate laboratory which can produce 10 micron chips for education and research purpose.

In 1996 NECTEC helped establish Software Park Thailand as an entity within NSTDA. The major task of Software Park Thailand (SWP) is to promote and support Thai software industry by providing space areas for software companies, developing and recruiting capable human resources, marketing Thai software products, securing investment and providing access to the latest software technology. SWP aims to

grow the domestic software industry and instill confidence in this industry for overseas operators wishing to establish themselves here in Thailand [2].

Since the start of the SWP, a connection with the Software Engineering Institute (SEI), Carnegie Mellon University, was established. An expert in software process improvement was sent from SEI to train Thai software engineers on software process improvement concept and SW-CMM (Software Capability Maturity Model). Six software engineers were trained to become SW-CMM Lead Assessors as well as SW-CMM Instructors. This initiation was enthusiastically responded and about twenty software development companies and agencies adopted SW-CMM.

In 2000 SEI [3] announced the transition from SW-CMM to CMMI (Capability Maturity Model Integration). SWP has agreed to become a Transition Partner of SEI and invested in training two SCAMPI Lead Appraisers and an Introduction to CMMI Instructor. (SCAMPI is an acronym of Standard CMMI Appraisal Method for Process Improvement.) Due to the high cost of investment in adopting CMMI, only a few companies expressed an interest in this model. The slow acceptance of CMMI among Thai software companies created a lot of concern for SWP. This leads to a new initiative in software process improvement program, namely SPI@ease.

2. SPI@ease

SWP realizes that software process improvement is necessary to ensure that the products are of high quality. If software companies are still not convinced to adopt CMMI or a similar software process model in their operations, it will be difficult for Thai software industry to gain confidence among customers. Therefore, SWP in collaboration with another NSTDA agency, ITAP (Industry Technology Assistance Program) announced a special program, namely, SPI@ease program to provide financial supports to software companies that want to adopt CMMI in their operations.

SPI@ease program was announced in 2007 and was well received by Thai software companies. Finally 26 companies were screened to receive the financial support for software process improvement activities aiming to successfully pass the SCAMPI appraisals.

The financial support is categorized into 3 groups. The first group includes the software companies which aim to achieve CMMI Maturity Level 2 (ML2). Each company will receive about 70% of the expense but not more than baht 800,000 after

achieving ML2. The second group includes those aiming to achieve ML3 and each company will receive also 70% of its expenses but not more than baht 1,200,000. The third group includes those aiming to achieve ML4&5 and each company will receive also 70% of its expenses but not more than baht 1,500,000 [2].

SWP invited CMMI consulting companies to participate in this program to provide CMMI consulting as well as appraisal services. Altogether 10 Thai and expatriate companies express their interest in the program. Match making between software companies and CMMI consulting companies started on March 15, 2007. At present only one company has achieved ML2 and a few companies will be appraised soon.

To ensure that the financial support provided by SPI@ease program is not in vain and the software companies really achieve their process improvement goals, SWP appointed a group of university instructors in SW Engineering to help audit the work done. About 20 instructors are trained in the course Introduction to CMMI V1.2. They are asked to participate in the software process improvement activities of the software companies and to report on the progress of the work to SWP. SWP also expect that this approach will also make these instructors acquaint themselves with the real practice in software development and that they can bring their experience to teach in their classes later.

3. Software Process Improvement

Software development in the early days of the computer era had many problems and many experts tried to identify the causes of such “software crisis”. This attempt leads to the development of “Software Engineering Discipline” which simply hypothesizes that development of software is akin to the process use in other engineering disciplines [4]. A model for software process which was later known as a waterfall model was suggested by Royce [4]. In 1970, the Department of Defense founded the Software Engineering Institute in the Carnegie Mellon University to conduct research on software engineering. Later, SEI proposed a new software process model to the world and it was enthusiastically accepted. The model was named the Software Capability Maturity Model. Later, SEI revised the model and introduced a new model, Capability Maturity Model Integration, which is still in use today.

The principles behind both models are simple: software process can be improved and the

improvement of software process evolve along the path starting from the level at which the organization may have only ad hoc processes to the highest level at which the organization has continuously improved processes. The organization wishing to improve processes should follow the path recommended in the SW-CMM or CMMI strictly because this path has been analyzed and synthesized from the best practices of many successful software organizations.

The term “software process” means “*a set of activities, methods, practices, and transformations that people employ to develop, enhance, and maintain software and the associated artifacts*” [5].

CMMI defines the term process as “*activities that can be recognized as implementations of practices in a CMMI Mode*” [6].

In CMMI there are two kinds of practices: specific practices and generic practices. Both of them are an expected CMMI Model component considered to be important in achieving the associated specific and generic goals of the corresponding process areas.

There are altogether 22 process areas in the CMMI v1.2 model. An organization that has achieved the highest maturity level in CMMI must successfully achieved all specific and generic goals of these 22 areas [6].

CMMI identifies five maturity levels with the corresponding number of process areas as follows:

Level 1 – Initial Level: No process area

Level 2 - Managed Level: 7 process areas

Level 3 - Defined Level 18 process areas

Level 4 – Quantitatively Managed Level 20 Process areas

Level 5 – Optimizing Level 22 process areas.

The main idea of CMMI is: an organization can improve its processes by institutionalize generic practices which emphasize management, control, and improving each process. The organization should follow the recommendations provided in the model by developing organizational process descriptions for all the processes involved in the software development. These process descriptions should be redefined using a tailoring guideline developed by the organization for each project. Project management must be used to ensure that the activities are performed based on the defined descriptions. At the end of each project, improving information must be gathered and fed back to the organization for future use.

Most Thai software companies are small and do not want to follow the CMMI model which is suitable for large scale projects and for large companies. They understand the need to have a best practice guideline for the small and medium software enterprises. On the other hand, they argue that CMMI is suitable for companies that compete in the world market but their

software products are mostly small and used only in Thai environment. They need another guideline that they can be used without much investment in time and effort as needed in the CMMI model.

4. Thai Quality Software (TQS)

In September 2003 the Thai Cabinet approved the establishment of another software related organization within the Ministry of Information and Communication Technology. The new public organization is named the “Software Industry Promotion Agency” or “SIPA” [7].

SIPA immediately saw the need for a software development guideline which is more suitable to Thai software SME’s. SIPA then help fund the development of such guideline which at that time was being researched by the Association of Thai Software Industry (ATSI) [8]. An international workshop was organized in Bangkok in 2005. Many software quality experts from several countries attended the workshop and this event led to the draft of another ISO standard: ISO 29110. It is expected that the draft ISO 29110 will be announced very soon.

At present, ATSI has modified the TQS to match with the ISO 29110. ATSI, SWP, SIPA and ITAP are now working closely to promote the use of TQS for Thai software SME’s and CMMI for larger Thai software companies.

5. Feedback from CMMI and TQS Adopters

During the months of March to May 2008, ATSI, SWP, SIPA and ITAP collaborate in organizing several half a seminar in Bangkok, Phuket, Khonkaen, and Chiangmai. The objectives are to convince software developers that Thai software industry must seriously consider to adopt a software process model to improve their software products. The seminar was well received and several useful discussions were made.

In one of the seminar session representatives from software companies that adopt CMMI and TQS mentioned that their staff are enthusiastic to follow the model. The admitted that at the beginning many programmers did not want to use the new software processes because they had to spend a lot of time filling the forms. However, after the programmers and other staff have acquainted with the new software processes, they agree that it is the good approach because it helps them to be more productive and can develop better software.

Other discussions are on the present computer science, computer engineering and information technology education. The seminar participants and speakers share the same idea that the current

curriculum may not produce the kind of software engineers that they want. Courses introducing the fundamentals of software process and software quality must be taught at the Bachelor's degree level. Graduates must realize the important of process improvement and how they can use the quality and improvement concepts in their work..

6. Conclusion

SW-CMM was introduced in Thailand in 1998 but not many software companies were interested to adopt the model at that time. After SW-CMM was revised and became CMMI in the year 2000, Thai software companies still did not understand the benefit of adopting this kind of software process model. The main reason is that the model is too large and it requires a lot of investment to adopt the model.

Around the year 2003, ATSI experts developed a small process model called TQS for Thai SW SME's. The new model was well received and about 100 hundred SW companies have adopted the model. ATSI received a financial support to further develop TQS into an international standard and an international workshop was organized in Bangkok. This leads to a draft version of ISO 29110.

In the year 2008, several organizations collaborate in funding Thai software companies to adopt either CMMI or TQS. The programs are well received by many software SME's. The results of this initiative to improve software processes in these companies are still to be observed in the future.

7. References

- [1] NECTEC, <http://www.nectec.or.th>.
- [2] Software Park Thailand, <http://www.swpart.or.th>.
- [3] Software Engineering Institute, <http://www./sei.cmu.edu>.
- [4] Sommerville I, Software Engineering, 3rd Ed., Addison-Wesley, UK, 1989.
- [5] A J Lattanze, Presentation on "The Emerging Integrated Capability Maturity Model", Carnegie Mellon University, 1999.
- [6] Chrissis M B, M Konrad, and S Shrum, CMMI Guidelines for Process Integration and Product Improvement, Second Edition, Addison-Wesley, New Jersey, USA, 2007.
- [7] Software Industry Promotion Agency, <http://www.sipa.or.th>.
- [8] Association of Thai Software Industry: <http://www.atsi.or.th>.