Software Process Improvement Initiatives in Thailand

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Topics

- Software Industry in Thailand
- Software Park and SW Process Improvement
- SPI@ease Project
- SEI and CMMI
- SIPA
- TQS
- Conclusion
Software Industry in Thailand

- Computers were used in Census and education in Thailand around 1960
- Early applications had a lot of difficulty-
  - Lack of experts
  - Lack of machines and programs
  - Lack of knowledge transfer
  - Lack of ability to accommodate Thai Characters in data, programs and reports
Need for Software Industry

- Around 1985, MOSTE saw the need to strengthen software industry.
- A committee was appointed but no action plan was developed.
- It is hard to convince people at that time because the PC era was very new and people just started to use more PCs.
Establishment of NECTEC

- Nectec (National Electronic and Computer Center) was established in 1986 to help push research in Electronics and Computer including Software technology
- Many students were granted scholarships to study abroad and came back to be researchers
Nectec helped establish software park Thailand in 1996 with objectives to

- Be a central place for Thai software promotion activities,
- Providing advanced training in SW
- Initiate approach to strengthen SW Industry
- Push public and private organizations to work together to solve SW problems and obstacles.
Software Park and SEI

- Nectec has tried to get support from SEI long before the establishment of SWP.
- The connection was possible when SEI opened up and used CISE to promote SEI’s products.
- We have been helped by CISE to start our software process improvement program which leads to the adoption of SW CMM and CMMI.
SW CMM

- SW-CMM was developed by SEI around 1990 as a model of software community practices and was well received by SW industry worldwide.
- CISE helped trained Thai experts to think about SW process improvement around 1997.
- Six SW-CMM instructors and six CBA-IPI lead assessors were trained.
- More than 20 companies adopted SW-CMM.
In 2000, SEI announced a new model: CMMI (Capability Maturity Model Integration) to replace SW-CMM. SWP needed to train SW experts to be able to teach and appraise SW organizations that adopt CMMI. Due to limited budget, only a few persons could be trained and the CMMI activities are slow.
What is Software Process?

- A J Lattanze at Carnegie Mellon University gave the meaning of Software Process as

"a set of activities, methods, practices, and transformations that people employ to develop, enhance, and maintain software and the associated artifacts"
Development of Software

People

Software

Technology

Processes
Why emphasizing process capability?

- Industry must always be able to predict its product quality, time to produce products, needed resource, manpower and performance.
- However, software development is usually unpredictable, not finished on time, and required more budget.
- Most notoriously, the finished products do not meet the customers' requirements.
Software Process Capability

- *Software Process Capability* describes the range of expected results that can be achieved by following a given software process.

- Organizations having higher SW Process Capability levels will surely be able to achieve better results.
Software Process Performance

- represents the actual results achieved by following a software process
  - most individuals and organizations do not measure how much effort and resources are spent in developing software => they cannot improve the performance from lessons learned
  - must measure what you are doing, to know what you can do in the future (capability)
Organizational Maturity

- is the extent to which a specific set of specific processes is explicitly defined, managed, measured, controlled, utilized, and effective

- mature software organizations have the capability to perform in a consistent way to produce software
Capability, Performance, and Maturity

**Capability**
“we can expect N defects and T schedule slip”

**Performance**
“we achieved N defects and T schedule slip”

**Maturity**
“the degree of variation in capability and performance”

From A J Lattanze’s “The Emerging Integrated Capability Maturity Model
CMMI Maturity Levels

- Initial 1
- Managed 2
- Defined 3
- Quantitatively Managed 4
- Optimizing 5
## Staged Representation: PAs by Maturity Level

<table>
<thead>
<tr>
<th>Level</th>
<th>Focus</th>
<th>Process Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Optimizing</td>
<td>Continuous Process Improvement</td>
<td>Organizational Innovation and Deployment Causal Analysis and Resolution</td>
</tr>
<tr>
<td>4 Quantitatively Managed</td>
<td>Quantitative Management</td>
<td>Organizational Process Performance Quantitative Project Management</td>
</tr>
<tr>
<td>3 Defined</td>
<td>Process Standardization</td>
<td>Requirements Development Technical Solution Product Integration Verification Validation Organizational Process Focus Organizational Process Definition +IPPD Organizational Training Integrated Project Management +IPPD Risk Management Decision Analysis and Resolution</td>
</tr>
<tr>
<td>1 Initial</td>
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</tbody>
</table>

**Risk Rework**

**Quality Productivity**
### Continuous Representation: PAs by Category

<table>
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<th>Category</th>
<th>Process Areas</th>
</tr>
</thead>
</table>
| **Process Management** | Organizational Process Focus  
                            Organizational Process Definition +IPPD  
                            Organizational Training  
                            Organizational Process Performance  
                            Organizational Innovation and Deployment |
| **Project Management** | Project Planning  
                            Project Monitoring and Control  
                            Supplier Agreement Management  
                            Integrated Project Management +IPPD  
                            Risk Management  
                            Quantitative Project Management |
| **Engineering**      | Requirements Management  
                            Requirements Development  
                            Technical Solution  
                            Product Integration  
                            Verification  
                            Validation |
| **Support**          | Configuration Management  
                            Process and Product Quality Assurance  
                            Measurement and Analysis  
                            Decision Analysis and Resolution  
                            Causal Analysis and Resolution |
Process Area Components in the Model

- Process Area (PA)
  - Specific Goals (SG)
    - Specific Practices (SP)
      - Typical Work Products
      - Subpractices
  - Generic Goals (GG)
    - Generic Practices (GP)
      - Subpractices
      - Generic Practice Elaborations

Legend:
- Required
- Expected
- Informative
Implementation of CMMI

- Initiation to adopt CMMI
- CMMI project starts
- Select consultants
- Form a Software Process Improvement Team and join SPIN(et work)
- Study current practices
- Create software processes and other related procedures, standards, etc.
- Review and modify processes
Implementation of CMMI 2

- Start pilot the use of CMMI in a real project and modify the processes
- Train staff to use SW processes in all projects
- Thinking about appraisal
- Select lead appraisers
- Gap analysis and modification
- Appraisal
- Implement improvement
 SPI@ease

- In 2006 SWP tried to push CMMI among Thai SW companies
- In 2007 SPI@ease project started with
  - 26 companies participated
  - 25 SW instructors became observers in the SW development activities
  - ITAP participates as a funding agency
SIPA: Software Industry Promotion Agency

- A public organization within the Ministry of Information and Communication Technology
- Established September 23, 2003
- Vision
  - SIPA takes Thai software industry to the world market.
SIPA’s Mission

1. Develop the standard of software personnel and organization.
2. Develop software product, innovation, and services up to the international standard.
3. Collaborate with partners, develop market network and public relations both internal and international level.
4. Coordinate and resolve problems on the implementation of one-stop service for software industry.
5. Promote the application of Thai software products in every industry.
6. Promote the intellectual property protection on software products.
SIPA and TQS

- SIPA supported the Association of Thai Software Industry to develop another software process model – TQS
- At present about 100 SW companies are adopting this TQS
- TQS will be further modified to match with ISO 29110
- SIPA also supported CMMI for large SW organizations.
Conclusion

- Several Thai organizations are trying hard to promote the use of SW process models
- The support aims at
  - Companies to get incentive to improvement
  - SW instructors to learn how software is actually developed so that they can use the knowledge to teach their students.