從CMMI輔導 – 來看產學合作之實務與應用研究

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CMMI
能力成熟度整合模式
INTRODUCTION TO CMMI

- Capability Maturity Model Integration
- Originated in Crosby, Established by SEI CMU
- Integrated (all-in-one)
- Comprising of 22 “process areas (PA)"
  - Viewing organization in terms of “process”
  - Thus modeling software organization’s software business activities into “process areas”
- Two representations. Five ML and six CL correspondingly.
ML vs. CL

Five ML
1. Initial
2. Managed
3. Defined
4. Quantitatively managed
5. Optimizing

Six CL
0. Incomplete
1. Performed
2. Managed
3. Defined
4. Quantitatively managed
5. Optimizing
SEMANTICS IN ML/CL

- Initial or Incomplete:
  - Default to any software organizations

- Managed:
  - Similar projects have similar results

- Defined:
  - Processes are characterized and can be tailored during project planning/re-planning.

- Quantitatively Management:
  - Manage projects and processes by numbers

- Optimizing:
  - Continually efforts in identifying common causes and enhance core tech for org’s better tomorrow
CMMI, WHAT’S INSIDE?

- A what-to-do model that focuses on
  - Project management’s processes/PAs
  - Engineering’s processes/Pas
  - Supporting processes/PAs
  - Processes/PAs for managing the above processes
TWO THEMES IN CMMI

- Standard process (SOP) ??
- Institutionalized processes ??

CMMI implementation has two themes:
  - To establish “standard processes”
  - To institutionalize these standard processes.
MORE ON INSTITUTIONALIZATION

- A standard process alone cannot guarantee its real use.
- Still need more acts on four dimensions:
  - Commitment
  - Ability to perform
  - Directing implementation
  - Verifying implementation
- Example of these four dimensions?
WHAT-TO-DO IN INSTITUTIONALIZATION

-- GENERIC PRACTICES

- 2-1 Establish policies
- 2-2 Plan the processes
- 2-3 Provide resources
- 2-4 Assign responsibilities
- 2-5 Train people
- 2-6 Manage configurations
- 2-7 Identify RS
- 2-8 Monitor & control the processes
- 2-9 Objectively evaluate the processes
- 2-10 Review status with the higher-ups

- 3-1 Define the processes
- 3-2 Collective performance data
- 4-1 Quantitatively manage projects
- 4-2 Quantitatively manage processes
- 5-1 Identify common causes
- 5-2 Continually improving processes
SO TECHNICALLY SPEAKING: ML

- **Managed:**
  - Implements the best practices for certain PAs on ML-2
  - Implement GP2-1~2-10
- **Defined:**
  - Implements the best practices for certain PAs on ML-2 & 3
  - Implement GP2-1~3-2 for all PAs so far
- **Quantitatively Managed:**
  - Implements the best practices for certain PAs on ML-2,3 & 4
  - Implement GP2-1~4-2 for all PAs so far
- **Optimizing:**
  - Implements the best practices for certain PAs on ML-2,3,4 & 5
  - Implement GP2-1~5-2 for all PAs so far
SO TECHNICALLY SPEAKING: CL

- **Managed:**
  - Implements the best practices for a particular PA
  - Implement GP2-1~2-10 for that PA

- **Defined:**
  - Implements the best practices for a particular PA
  - Implement GP2-1~3-2 for that PA

- **Quantitatively Managed:**
  - Implements the best practices for a particular PA
  - Implement GP2-1~4-2 for that PA

- **Optimizing:**
  - Implements the best practices for a particular PA
  - Implement GP2-1~5-2 for that PA
INSTITUTIONALIZATION: SOFTWARE ENGINEERING (SE) EXAMPLE

Verification & Validation
1. Establish standard V&V processes, for example?
   • Refer to a case of my client
2. To institutionalize the V&V processes, for example?
   • Refer to the same case
INSTITUTIONALIZATION: NON-SE EXAMPLE

- Your call! My explanation!!
CMMI in Taiwan
How are we doing?

- Nearly 80 organizations are certified
- Meaning what?
- How do software orgs. doing?
  - Answer two questions:
    - Why implementing CMMI?
    - Why getting certified?
- How do consulting companies doing?
  - What does process templates mean to them?
- How do software clients doing?
  - Are they doing better because of the certified suppliers they chose? (e.g. the High Speed Rail case)
HOW ARE WE DOING?

- It seems that CMMI (unless higher ML/CL) results in several *problems*:
  - Process overwhelming (繁文縟節)
  - Process cramp (制度僵化，缺失創意)
  - Process bureaucracy
  - Too many steps to do
  - Too many documents write
- These may also occur in my clients!
VIEWPOINTS ON CMMI PROCESSES

- The frontline workers
  - that is, the “victims”

- The boss
  - Who wants to turn individual implicit experiences into organizational, explicit knowledge

- The client
  - Are they willing to give you next projects?

- The person who takes over your work
  - Either this people or the frontline workers are victims?

- So how do you design the processes?
Research issue 1

- Needs of ways to reduce or avoid the above problems.
- My way: problem oriented CMMI implementation
  - The NTC case。合作單位：南亞科技
  - The ESNE case。合作單位：翰昇環境科技
  - IPPD that cover cross-strait collaboration and management issue:
    - The FTC case。合作單位：台塑網
- Anything else? Welcome for discussion!!!
APPLYING CMMI
FIRST: CMMI ABSTRACTION

- Gee...not enough abstraction?
- The generality of CMMI lie in:
  - The model framework, e.g.:
    - the concept of process area, goals and practices
    - levels of maturity and capability
  - The concept of institutionalization
  - Process focus is the most critical criteria of applicability!
- Applying CMMI in other industries/fields
  - See the following examples (in Chinese)
  - Multi-disciplinary in nature... good for IM & IE researchers
Example 1

- Restaurant management (餐飲管理CMMI – a working paper by C.Y. Chen)
- How do you apply concept of CMMI in managing restaurant?
- See next (in Chinese)
餐飲管理CMMI：能力度意含

若把『烹飪』當成是一“流程領域”，依CMMI的CL設計，你覺得烹飪會有那些深化程度的差異？

- CL-1：每次都能完成『烹飪』所規定的基本要求（what-to-do）
- CL-2：對於烹調『蔥爆羊肉』每次都煮的差不多
- CL-3：烹飪細節有更詳盡定義（特徵化）及因人客要求而稍加變化。
- CL-4：用各式數據來控制烹飪（鹽幾克、溫度、水份、時間等）
- CL-5：嘗試不同的烹飪創新手法，創造更好吃，品質更穩定的『蔥爆羊肉』

Resource: NTC CMMI Speech
餐飲管理CMMI：成熟度意含

- 『烹飪』只是餐廳廚藝的一部分，還包括『採買』,『清潔廚房』,『廚藝創新』,『口味確認』 ......
  - ML-2：對於烹調『蔥爆羊肉』每次進行的『廚房管理(可能包括一些PA)』都有蠻一致的表現
  - ML-3：所有餐廳廚藝的所有流程有更詳盡定義及特徵化
  - ML-4：用各式數據來控制所有流程領域，每次的烹調都是經嚴格的量化要求
  - ML-5：對於各PA研究更正確的手法，並創造更多創新的菜餚

強調餐廳在餐廳廚藝上的整體表現。

Resource: NTC CMMI Speech
EXAMPLE 2

- EB-CMMI (an accepted journal paper by C.Y. Chen)
- 合作單位：台北市電腦同業公會
OTHER APPLICATIONS?

- Teaching CMMI (a working paper)
  - A teacher with XX-level of teaching capability in ZZZ (e.g. “course planning” process area)?
  - A mature teacher in terms of xxx, yyy, zzz?

- Learning CMMI? (a working papers)
  - How to become a “mature” student??
  - A learning capability level XX student??

- 新聞製播及新聞媒體CMMI (a working paper)
  - Information quality is getting important in this information age...
END OF SLIDE

DISCUSSION

Welcome for a joint research
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