

Process Improvement for Small Organizations

Hareton Leung



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Agenda

- Reality of Process Improvement
- SME is Unique
- Improvement Approaches
- Critical Success Factors

Reality: Many Process Standards

- ISO 9001 – Quality management system
- ISO12207 – Information technology – software life cycle processes
- ISO 15504 – Software Process Improvement & Capability Evaluation
- ISO 9241 – Usability engineering
- ISO 10006/10007 – Project management
- Provide abstract requirements on processes, no concrete specification on implementing these processes.



Reality: Many Reference Models

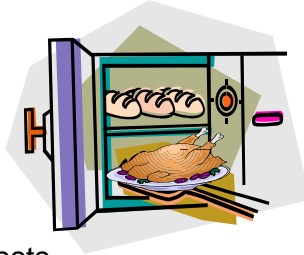
- SW-CMM, CMMI, SPICE, PSP, TSP, SA-CMM
- Provide 'Best practices'
- More complete than the Standards
- Nevertheless, they are relatively abstract, no concrete guidelines on implementation
- *Models have been around for many years*
- *But, their impact is minimal among SME*
- *Are they useful for SME?*
- *How best to use them?*

Following traditional process brings little value

A boy asked his mother. "Why you cut the end off a pot roast before you put the roast into the oven."
"Because that's what my mother taught me to do."

She then asked her own mother.
"I don't know. I've always done it because that's what I saw your grandmother do."

She then asked her grandmother.
"Back then, I had a small roasting pan - roasts wouldn't fit into the pan unless I cut off the ends."



Suitable development processes can improve sw quality

Reality: CMMI is hot in China

- In the last few years, many larger organizations have adopted SW-CMM/CMMI

Mainland China (Dec. 2007)

- >600 companies Level 2-4
- >11 Level 5 CMMI

India (Jan. 2008)

- 85 Level 5
(30% of all Level 5 companies in the world)

Taiwan (March 2008)

- 52 Level 2
- 19 Level 3
- 3 Level 5

Reality: SME

No Time

- "We just don't have time to change the way we develop systems. Quality improvement is a great idea, but we don't have anyone available right now!"

- *Under-resourced (lack financial resource to do quality improvement)*

Reality: SME

Inertia

- "Things aren't so bad, why should I want to do anything differently. No one has yelled at me for over 2 weeks!"

- *No real need to improve.*

Management buy-in

- "If management doesn't tell us to improve quality, give us time, and a budget, nothing is going to happen. It is a waste of time to talk about quality."

- *Lack management support*

Reality: SME

We need training

- “We have to get this project done first, before we can consider quality improvement suggestions. When will we have time for training?”

- *Lack of trained staff*
- *Limited process knowledge and knowledge in software engineering*

The Essence of Survival

Improvement

Every morning in Africa,



a gazelle





wakes up. It knows it must run faster than the lion or it will be killed.

Every morning in Africa, a lion



wakes up.

It knows it must outrun the slowest gazelle or it will starve to death.

It doesn't matter who you are ( or )
When the sun comes up, you'd better be running.

Reality: SME

- Want
 - ✓ Minimum investment (low cost solution)
 - ✓ Minimal disruption
 - ✓ Quick results and ROI
- Don't want
 - × too many documentation
 - × Restrictive and inflexible processes
 - × to devote resources to develop their own version of improvement programme

However

If you devote minimal resources, allow limited time and no other support, **can you expect any significant improvement?**



A higher payoff only if you apply sufficient resources, allow sufficient time and good support!

Characteristics of S/W SME

- 1-50 staff
- Aim to deliver functionality quickly
- Everybody is busy, playing multiple roles (>100% time)
- Quality and process improvement not high priority
- Limited budget
- Want *quick* solution



Characteristics of S/W SME

- The software lifecycle is often very simplified (just 2 main phases: development and testing)
- Some processes (customer-supplier relationship practices) are good, while other are not.
- Control procedures are poorly formalized. Lack of control leads to uneven quality
- Some SME lack project management and planning practices
- Resources devoted to training and human resources practices are very limited

Characteristics of S/W SME

- Service to customer is unequal. Software quality is not consistent. Sometimes acceptable and sometimes not.
- Project-focused. Lack long-term strategy. No learning and knowledge management practices
- Internal communication is often very informal.
- No risk management

SME is Unique

SEI Project: Improving Processes in Small Settings (IPSS)
(<http://www.sei.cmu.edu/iprc/ipss.html>)

Aim:

- demonstrate effective approaches to process improvement for the small business
- provide tools for process improvement that are easily applied by small businesses

Key Challenge

- Getting acceptance and implement the right processes within the SME.

Improvement Approaches

(1) Incremental

- Try to improve one or two processes (e.g., better testing)
- Modest scope of improvement
- Get result quickly
- Small team, part-time
- Self-directed team, headed by a mid-level manager.
- No formal budget is needed
- *Duration: A few months*



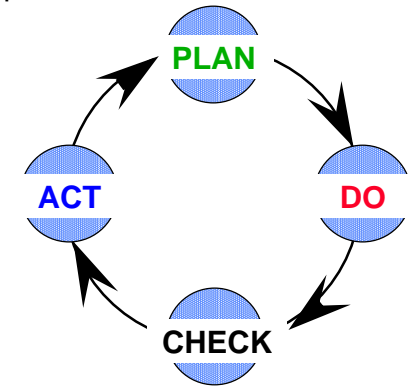
Follow the PDCA Cycle

PLAN plan change aimed at improvement

DO carry it out, preferably on small scale

CHECK study results; what did we learn?

ACT adopt change OR abandon it OR run through cycle again, possibly under different environmental conditions



[from *The Team Handbook*]

Improvement Approaches

(2) Redesign

- Larger scope of improvement (e.g., achieve CMMI level 2)
- Higher impact on quality
- A more formal approach
- Some member of the team is full-time staff
- Have a project leader of improvement project
- Require more times and effort
- Regular reporting
- *Duration: 6-24 months*

Improvement Approaches

(3) Rethink

- Fundamental and wide-ranging changes (e.g., level 5 CMMI)
- Involve more full-time staff and formal project structure (steering committee, program task force)
- More investment
- A full time project management role is required
- Achieve a new level of performance
- More than just quality improvement (cost reduction, cycle time reduction, customer satisfaction)
- *Duration: 2-4 years*

Implementation Approach: Cookbook

Rapid-Q from Wipro Technologies



- **Process asset:** a library of Processes, Templates, Procedures and Guidelines
- Have “common-how” part with clearly defined roles and approval authority

MESOPYME



- Action package to establish and maintain a new process.
- 5-7 months to implement a few Process Areas

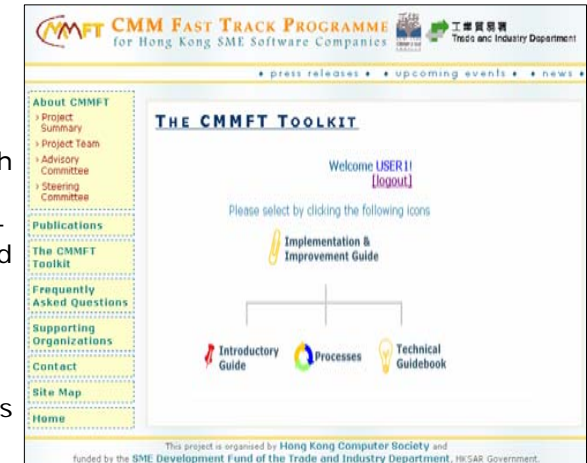
Implementation Approach

CMMFT **CMM Fast Track Toolkit** for SMEs

- Reach development capability of Level 2 (Managed) and Level 3 (Defined) of CMMI

Toolkit:

- **Introductory Guide**
- **Procedure Manual** – “Process Guides” to reach Levels 2 and 3;
- **Technical Guidebook** – guidelines, templates and techniques;
- **Implementation & Improvement Guide** – describes the steps to follow and critical success factors.



Documents	Objectives	Target Readers
Introductory Guide	<ul style="list-style-type: none"> ▪ Provides the background of CMMI ® and the CMMFT programme; ▪ Gives an idea of what to expect when embarking on the process improvement journey 	<ul style="list-style-type: none"> ▪ CEOs of IT SMEs ▪ IT Heads in large organizations ▪ Sponsors of CMMI ® in IT SMEs or large organizations with IT Departments ▪ People who are interested in CMMI ® implementation, but are not sure how to get started.
Implementation and Improvement Guide	<ul style="list-style-type: none"> ▪ Provides details of how to implement CMMI ® in an IT SME setting 	<ul style="list-style-type: none"> ▪ IT Heads in large organizations ▪ Project Managers ▪ People who are interested in CMMI ® implementation, but are not sure how to get started.
Technical Guidebook	<ul style="list-style-type: none"> ▪ Has templates for use ▪ A companion to “Procedure Manual” 	<ul style="list-style-type: none"> ▪ Project Managers ▪ Engineers
Procedure Manual	<ul style="list-style-type: none"> ▪ Allows readers to follow detail step-by-step of processes 	<ul style="list-style-type: none"> ▪ Project Managers ▪ Engineers

Approach by ISO SC7 WG 24

ISO SC7 WG 24 started a new project for VSE in 2005

VSE: very small enterprises (<25 staff)

Objectives:

- Make the current SE standards more accessible to VSEs
- Provide documentation requiring minimal tailoring and adaptation effort
- Provide harmonized documentation integrating available standards such as process standards, work products and deliverables, assessment, modeling and tools
- Take into account, the notions of capability and maturity levels presented in ISO/IEC 15504 and CMMI.

ISO WG 24 Approach

Approach:

- Target low capability VSEs (of size below 10 initially)
- Select the ISO/IEC 12207 process subset
- Tailor the subset to fit VSE needs
- Develop guidelines in the form of **deployment packages**

Deployment packages:

- Process description (tasks, inputs, outputs, and roles)
- Guide
 - Checklist
- Template
 - Example
- Presentation material
- Mapping to standards and models
- List of tools to help implementation of the process

ISO WG 24 Approach

Current Status:

- 3 deployment packages (change management, project management, testing) ready by May 2008
- Freely available at <http://profs.logti.etsmtl.ca/claporte/English/VSE/index.html> or www.cetic.be/indexEN.php3
- Invite VSE to trial the deployment packages
- More packages will be developed later

Critical Success Factors

- Process improvement must bring business benefits (increase the value delivered to the customer, or reduce cost), positive ROI.
- Must not force process onto the developers. Get input from your developers
- Your defined process must allow tailoring based on project characteristics.
- Must regularly review your process by adding, merging and deleting some steps.

Critical Success Factors

- Don't be bureaucratic. Otherwise, working staff will manipulate and work around your process!
- Try to automate the process as much as possible – make it easier for the users
 - Automate reviewing and approving documents
 - QA process
 - Metric collection

Critical Success Factors

- Set modest improvement goal at the beginning (e.g., use the incremental approach)
- Start with the **open source material** (e.g., CMMFT, ISO SC 7 WG 24 packages)
- Allow sufficient time for implementing process improvement



Where to get more information?

- SEI (<http://www.sei.cmu.edu/iprc/ipss.html>)
- Hong Kong Software Process Improvement Network (HKSPIN) (http://www.hkcs.org.hk/en_hk/sg/hkspin/index.asp)
- CMMFT (<http://www.cmmfasttrack.hk/>)

*Thank You
for your participation!*

