

***CMM vs. Agile –
Finding the right fit for your project***

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CSC

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Dedication

Irina Curtin

(1975-2009)

Raymond Fischer

(1943-2010)

Software Project Allocation of Effort

| | Requirements Analysis | Preliminary Design | Detailed Design | Coding and Unit Testing | Integration and Test | System Test |
|---------------|-----------------------|--------------------|-----------------|-------------------------|----------------------|-------------|
| 1960s – 1970s | 10.00% | | | 80% | 10.00% | |
| 1980s | 20.00% | | 60.00% | | 20.00% | |
| 1990s | 40.00% | 30.00% | | 30.00% | | |

Source: Andersson, M., and J. Bergstrand. 1995. "Formalizing Use Cases with Message Sequence Charts." Unpublished Master's thesis. Lund Institute of Technology, Lund, Sweden.

History of CMM and CMMI

- **Starting in 1991, Capability Maturity Models have been developed for a number of disciplines.**
- **The landmark book, “*The Capability Maturity Model – Guidelines for Improving the Software Process*”, was first published in 1994.**
- **Over the years, CMMs have been produced for a myriad of disciplines, including systems engineering, software engineering, software acquisition, workforce management and development, and Integrated Product and Process Development.**
- **CMMI (CMM Integration) was a project to sort out the problem of using multiple CMMs in practice.**

CMMI Process Areas

- **Maturity Level 2 - Managed**
 - **CM - Configuration Management**
 - **MA - Measurement and Analysis**
 - **PMC - Project Monitoring and Control**
 - **PP - Project Planning**
 - **PPQA - Process and Product Quality Assurance**
 - **REQM - Requirements Management**
 - **SAM - Supplier Agreement Management**

CMMI Process Areas

- **Maturity Level 3 - Defined**
 - **DAR - Decision Analysis and Resolution**
 - **IPM - Integrated Project Management +IPPD**
 - **OPD - Organizational Process Definition +IPPD**
 - **OPF - Organizational Process Focus**
 - **OT - Organizational Training**
 - **PI - Product Integration**
 - **RD - Requirements Development**
 - **RSKM - Risk Management**
 - **TS - Technical Solution**
 - **VAL - Validation**
 - **VER - Verification**

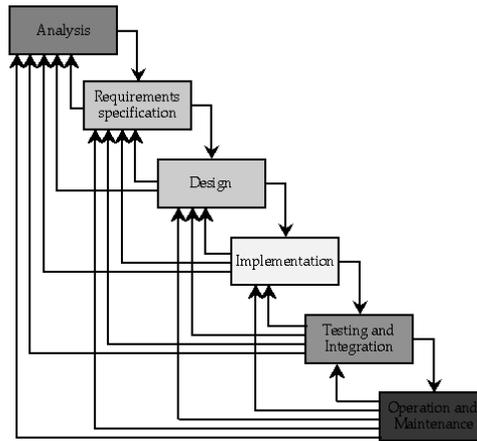
CMMI Process Areas

- **Maturity Level 4 - Quantitatively Managed**
 - QPM - Quantitative Project Management
 - OPP - Organizational Process Performance
- **Maturity Level 5 - Optimizing**
 - CAR - Causal Analysis and Resolution
 - OID - Organizational Innovation and Deployment

CSC North American Public Sector – CMMI Level 3 Certified

- **CMMI model provides a framework**
 - Links organizational processes to business objectives
 - Enables organizations to continue optimizing performance in management, product development and delivery
- **CMMI Appraisal evaluates compliance to the model**
 - Engineering, Development, and Management
 - Processes and products
- **Level 3 validates**
 - Solid processes are in place
 - They are executed consistently
- **CSC North American Public Sector division certification**
 - Four independent appraisal companies in 2009
 - An exhaustive review of more than 20 NPS programs

Waterfall Process



<http://www.csse.monash.edu.au/~jonmc/CSE2305/Topics/07.13.SWEng1/html/text.html>

CSC CatalystSM Process Framework

| Catalyst Phase Summary | |
|------------------------|---|
| Phase | Purpose |
| Vision and Strategy | <ul style="list-style-type: none"> ● Establish business objectives ● Create future vision ● Define and prioritize business areas |
| Architecture | <ul style="list-style-type: none"> ● Define requirements for affected domains of change ● Describe and design major processes ● Create structure to guide development ● Plan releases |
| Development | <ul style="list-style-type: none"> ● Complete detailed design ● Build, transform, or acquire applications and infrastructure to support processes |
| Integration | <ul style="list-style-type: none"> • Validate entire business solution, optionally using authentic pilot |
| Deployment | <ul style="list-style-type: none"> • Deploy all aspects of business solution to target locations |
| Operational Services | <ul style="list-style-type: none"> • Continuously operate and improve computing environment |

Agile Approach

| | | |
|---------------------------------------|-------------|-----------------------------|
| Individuals & interactions | <i>over</i> | processes and tools |
| Working software | <i>over</i> | comprehensive documentation |
| Customer Collaboration | <i>over</i> | contract negotiation |
| Responding to Change | <i>over</i> | following a plan |

- **Deliver working software frequently**
- **The most efficient and effective method of conveying information is face-to-face**
- **At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly**

<http://agilemanifesto.org>

Agile Considerations

- **One of the key tenets of Agile is access to the customer—the end user; this is essential to the Agile way of doing business.**
- **While reviewing multiple references on Agile, we found that indeed, the concepts used in Agile are not new. Some were used as early as the 1950s and through the 60s and 70s, and on into the 80s^{*}. The Agile Manifesto gathered and documented the ideas and the Agile movement promoted them for the betterment of software development and added value to the end user.**

*D. F. Rico, H. H. Sayani, and S. Sone, *What is the ROI of Agile vs Traditional Methods? An analysis of XP, TDD, Pair Programming, and Scrum (Using Real Options), synopsis of The Business Value of Agile Software Methods*. J. Ross Publishing, 2009. [Online].
www.jrosspub.com/Engine/Shopping/catalog.asp?store=&category=&itempage=&item=14200&itemonly=1

Agile Considerations

- **Continuous integration of software is contingent upon the ability to concurrently execute two crucial activities:**
 - **(1) collect incremental changes from multiple developers on a regular basis, ideally on a daily basis, and**
 - **(2) perform the nightly build discipline, where all changes are brought together in an incremental software baseline, which is in turn compiled and tested with the available unit and regression tests.**
- **Agile teams tend to be less formal but are highly disciplined.**

*Mary Ann Lapham , Ray Williams , Charles (Bud) Hammons , Daniel Burton, Alfred Schenker ,
Considerations for using Agile in DoD Acquisition. CMU/SEI-2010-TN-002 , Technical Note,
April 2010.*

Where Agile Works

- **Small teams working on small incremental releases**
- **High employee retention rate is important**
- **Low number of customers or very high (>1000) customers**
- **Customer willing to spend time**
 - **Share expertise**
 - **Flexibility on contractual matters**
- **Testers work to identify the right things to test**
 - **Close collaboration with developers and customers**

Where Agile is Challenged

- **If documentation goes lacking, high employee turnover carries high risk**
- **Distributed teams need frequent interaction (internet meetings, email, blogs, etc. mitigate this)**
- **Multiple customers or constituencies may introduce requirement conflicts – how to resolve without tracing and documentation?**
- **Unless testers have subject matter expertise or close relationship with customer, testing may focus on the wrong things**

Agile Example - Facebook

- **Started with a basic idea**
- **Developed into a complex system for social networking**
- **Could you have sat down and written the specification for Facebook today, in 2003?**

Lessons From the CMMI Waterfall

- Requirements need to be documented in clear, unambiguous language
- Customers cannot always express what they want adequately – need process to elicit the information needed to build
- Customers and sometimes management will try to pad a release with too many features – use requirements tracing or other disciplined approach to show impact on testing and control scope
- How can you even have a scope discussion with customer without clearly defined requirements?
- With mass market products, beta testers may discover many new requirements – need to document and analyze and trace back to design and testing

Question for Discussion

Can you use Agile in a CMMI environment?

References

Capability Maturity Model® Integration (CMMISM) - www.sei.cmu.edu/cmmi/

Agile Manifesto - <http://agilemanifesto.org>

CSC CatalystSM Process Framework –
http://www.csc.com/delivery_excellence/ds/11388/13193-catalyst_concepts

FAA-STD-026A U.S. DOT FAA Standard, Software Development for the National Airspace System (NAS)
http://www.faa.gov/air_traffic/nas/system_standards/standards/media/pdf/FAA-STD-026A.pdf



Software Quality Group of New England

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Logo design: Sarah Cole Design

Slide 1

Welcome to our 17th season!

- An all-volunteer group with no membership dues!
- Supported entirely by our sponsors...
- Over 700+ members
- Monthly meetings - Sept to July on 2nd Wed of month
- E-mail list - contact John Pustaver pustaver@ieee.org

- SQGNE Web site: www.sqgne.org



Slide 2

Volunteers / Hosts / Mission

Officers and Volunteers

- John Pustaver – President and Founder
- Steve Rakitin – VP and Programs
- Gene Freyberger – Annual Survey
- Howie Dow – Treasurer
- Dawn Wu – Clerk and official Greeter

Our gracious Hosts:

- Paul Ratty – Board of Dir
- Tom Arakel
- Margaret Shinkle
- Jack Guilderson

Mission

- To promote use of engineering and management techniques that lead to delivery of high quality software
- To disseminate concepts and techniques related to software quality engineering and software engineering process
- To provide a forum for discussion of concepts and techniques related to software quality engineering and the software engineering process
- To provide networking opportunities for software quality professionals



Slide 3

ASQ Software Division

- Software Quality Live - for ASQ SW Div members...
- Software Quality Professional Journal www.asq.org/pub/sqp/
- CSQE Certification info at www.asq.org/software/getcertified
- SW Div info at www.asq.org/software






Slide 4

SQGNE 2010-11 Schedule

| Speaker | Affiliation | Date | Topic |
|---------------------|----------------------|----------|--|
| Steve and Howie Dow | | 9/8/10 | Test your Testing Aptitude! |
| Stan Wrobel | CSC | 10/13/10 | "CMM vs. Agile - Finding the right fit for your project" |
| Capers Jones | SPR | 11/10/10 | SOFTWARE QUALITY IN 2010: A SURVEY OF THE STATE OF THE ART |
| Linda McInnis | | 12/8/10 | Career Paths for SQA Professionals |
| Robin Goldsmith | GoPro Management | 1/12/11 | Add Steak to Exploratory Testing's Parlor Trick Sizzle |
| Rick Spiewak | | 2/9/11 | A fundamental approach to improving software quality |
| Stephen P Berczuk | | 3/9/11 | Build, SCM, and QA: Enablers for Agility |
| Johanna Rothman | Rothman & Associates | 4/13/11 | SQA in an agile environment |
| To be announced | | 5/11/11 | To be announced... |
| Marc Rene | MetLife Auto & Home | 6/8/11 | Maximizing the Value of Testing to the Business First Annual Election for SQGNE Board of Directors and At-large Members |
| Everyone | | 7/13/10 | Annual Hot Topics Night... |



Slide 5

Tonight's Speaker...

CMM vs. Agile - Finding the right fit for your project

Stan Wrobel, CSC

You're starting a new project and the programmers are clamoring to use Agile and Extreme Programming techniques while the testers are insisting on formal requirements, documentation and metrics. How do you choose which approach is best for you and your business? Can you interact closely with your customer and still do CMM? Can you generate metrics and improve processes while sprinting toward an Agile or Extreme Programming release? With over 30 years of experience, Stan Wrobel leverages his sometimes painfully earned knowledge and experience to help you make this decision - using real world examples of both grand successes and utter failures.

Bio: With over 30 years in the computer industry, Stan has served in a variety of roles, including applications specialist, requirements engineer, software developer, tester and manager of test teams. Starting out in the Computer-aided Manufacturing industry in 1978, Stan has branched out into fault-tolerant transaction processing middleware, commercial websites and finally into the National Air Traffic Management system. Stan is currently serving as ERAM/TFMS Integration Lead for Computer Sciences Corporation on the Traffic Flow Management Modernization program for the FAA.



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