

Atlanta SPIN

Software & Systems Process Improvement Network

The Atlanta SPINnaker

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“Unique Process Challenges in Developing Software for Mobile Devices”

Presented by Joseph Mathew



Joseph Mathew

This month we continued in our commitment to bring Atlanta SPIN speakers who are actual practitioners and working in fields that are not just software or systems development. Mr. Joseph Mathew has a 20 year history in software development but has taken that knowledge into the relatively new and certainly very significant area of mobile devices. While the technical challenges in mobile device development and manufacture are interesting and unique, we found that some of the problems and their solutions are very familiar to us all.

Joseph started by discussing some of the last 10 years of his career. Over this time he has worked for Panasonic, Danger Inc. and finally Microsoft. After reviewing some of the typical and traditional software development challenges, Joseph confirmed that these same challenges exist

in software for mobile devices. We then reviewed the mobile architecture at a high level. It covered the basics of how mobile devices attach to both the PTSN (public switched telephone network) and a gateway into the internet for access to other systems.

Next we looked at the architecture of a typical mobile device. The simple voice device from years ago has changed into a very complex device including blue-tooth devices, music players, GPS and even a camera. Joseph told some interesting stories about the resistance of some to the inclusion of a still camera into the device. Today many of these devices contain full motion video cameras. This discussion brought to light some of the technology challenges

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Next Meeting: May 20, 2009



Systems Engineering for Space Systems Architecture Development
Dr. Carlee A. Bishop

Time: 6:00 PM—8:30 PM
 Location: La Quinta Inn & Suites,
 6260 Peachtree-Dunwoody Road,
 Atlanta, GA 30328

“Unique Process Challenges in Developing Software for Mobile Devices” (Continued)

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unique to mobile devices. There are multiple radios in a typical modern device (digital connection to the network, Bluetooth, etc.). Devices must be fault tolerant and work under adverse conditions. They must also be reasonably fast to respond to commands, have sufficient memory to store necessary data (including the operating system), have a usable screen and interface to the human holding it (touch screen and full QWERTY keyboard), have reasonable software update capabilities, and have a battery sufficient to make it usable for reasonable time periods (active and standby).

Getting back to some of the traditional problems with software, Joseph discussed some more ways they apply to mobile systems. For example, mobile manufacturers have to consider how much of their system will be purchased from outside vendors. No mobile system manufacturer builds every component themselves. Another common area of concern is in testing. This includes mobility testing (can the device maintain a connection when it is moving down the street in a car), connection establishment among carriers, and automation of as much of the testing as possible.

A question was raised concerning development lifecycles. Joseph uses a blend of waterfall (to nail down requirements) and iterative (to move the device

to delivery in a step by step fashion) lifecycles. Factory requirements bring a new element of complexity to the software developer. These devices are built on an assembly line. Last minute software changes become impossible for the factory to absorb and still stay on schedule. Additionally, the government gets to have a hand in this. The FCC (Federal Communications Commission) has requirements for all electronic devices that emit radio frequency radiation. Do you want to fix problems at the source vendor? You better have an up to date passport and be ready for a long flight to China. (But think of all those air miles!!)

One very interesting item of note was the timeline for the typical development cycle. It is 18 – 24 months! That means that if you get the requirements wrong or have a long delay in development you could lose a lot of revenue if your competitor gets their device out before you. Joseph had several “Lessons Learned” to share with us based on his years of experience. Some of the most critical ones were getting a baselined set of requirements established early and manage scope creep closely. Another lesson was to develop iteratively and integrate testing all along the way. Designing for testability and manufacturability are critical for mobile devices.

The session ended with a lively question and answer session in addition to the many questions that were raised and answered during the presentation.

Call for Suggestions on Articles and Presentations

We regularly seek articles and related information that would be of interest to our readers and members. If you have a suggestion for an article please let us know by sending an email to “newsletter@atlantaspin.com”. Or better yet, if you would like to contribute an article of interest to our group, please contact us at the same email address and let’s talk about it.

The Atlanta SPIN meetings and newsletter strive to bring members excellent professional talks providing suggestions for improvement based on your feedback and ideas as the foundation. We want to hear from you!

Demystify your CMMI

By Bruce Duncil

This is the first of three articles exploring the CMMI® through the release of the latest models and providing tips for how you might use them to improve your business performance.

Like most people you've probably heard of Carnegie Mellon University's Software Engineering Institute (SEI) and their Capability Maturity Model® Integration, or CMMI®. And you probably are aware that CMMI® is a compilation of industry best practices designed for use by companies seeking to standardize and improve their processes, methods and skills. But what you may not know about are the recent extensions of the CMMI® framework. SEI guidance is now available to address three major interrelated areas:

- product and service development (CMMI-DEV),
- the acquisition of products and services (CMMI-ACQ), and
- the design and provision of services (CMMI-SVC).

All three of these CMMI® documents are available as Technical Reports and can be downloaded free of charge from the SEI website (www.sei.cmu.edu).

A Brief History of the CMMI

SEI released the Capability Maturity Model® (CMM®) for Software in the early 1990s. This early model was used world-wide as a means for determining the capability and the maturity of software development organizations. A primary driver for its creation was the need to control cost and schedule over-runs, particularly on large software projects. The model and its use, as with CMMI®, are founded upon the premise that the quality of a product is highly dependent upon the quality of the process (methods, tools, and skills) used to produce that product. Improve the process, you improve the product. The CMMI® built upon and expanded this and many other industry models to incorporate systems and hardware engineering as well

as integrated product development. It was also made more scalable to smaller companies, teams and development projects.

The building blocks of the CMMI® structure are the Process Areas. These are not themselves processes nor are they process descriptions. Rather, they are areas of practice (such as Project Planning) consisting of a cluster of related practices (Specific and Generic Practices) that, when implemented collectively, satisfy a set of goals (Specific and Generic Goals). In short, they provide the expectation as to what elements your process will include and the goals your process, when sufficiently robust, will allow you to accomplish. Achieving all the goals of a Process Area demonstrate a company's capability to perform that area of practice. All Process Areas are grouped by Maturity Level (Managed, Defined, Quantitatively Managed, and Optimizing). Achieving all the goals of all the Process Areas contained within a Maturity Level (and all lower Maturity Levels), demonstrates a company's process maturity, or degree of achieved improvement.

Version 1.2 of CMMI® was launched in March 2002. In that version, the CMMI® architecture was modified to provide for a CMMI® Model Foundation (CMF). The CMF includes those 16 Process Areas in Project Management, Process Management and Support categories that are common to all CMMI® models. The CMF spans all maturity levels. The CMMI® also includes additional material geared for particular users; this material is called a CMMI® addition. Combining the development-specific, acquisition-specific, or services-specific Process Areas and additions with the CMF creates the respective CMMI® "constellation": CMMI-DEV, CMMI-ACQ, or CMMI-SVC. In addition to the model Process Areas, each constellation includes training materials and appraisal-related documents supporting your use of the model for its respective area of coverage.

In our next article in this series we will explore all three models and the interrelationships among them.

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The Atlanta SPINnaker

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Contributor to this issue:

- Bruce Duncil

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Process Improvement Sites:**Software Engineering Information Repository**

<http://seir.sei.cmu.edu>, has over 30,000 registered users and is a forum used to contribute and exchange information about software engineering improvement activities, including CMMI.

The CMMI Process Improvement Yahoo! discussion group

http://groups.yahoo.com/group/cmmi_process_improvement/ is a forum used to contribute and exchange ideas about CMMI-based improvement.

BSCW Shared Workspace <https://bscw.sei.cmu.edu/pub/bscw.cgi/0/79783> is a forum used to contribute and exchange CMMI-related materials.

Information courtesy of SEI Customer Relations. Find out more about SEI Membership online at www.sei.cmu.edu/membership customer-relations@sei.cmu.edu

About Atlanta SPIN, Incorporated

www.atlantaspin.org

The Atlanta SPIN organization was chartered in 1994. This group has been a force for software process improvement in the Atlanta area since then. The organization has a growing membership list that currently numbers 850+ members. The group typically meets every third Wednesday of the month. Our meetings typically attract audiences of 40 – 50 people. These meetings provide a forum for like-minded people, interested in learning from others and sharing their own experiences. There is time allowed before and after the meeting for networking among the participants, including a review from the audience of any job openings that are available. The Board, through its work with Sponsors, ensures that food and drinks are also available at no cost to the membership. Atlanta SPIN is a 501C3 non-profit corporation. Your contributions may be tax deductible and qualify for corporate matching contributions from your company.